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LUCIO VINHAS DE SOUZA  
EXAMINES THE IMPACT OF  
PAST AND FUTURE EU  
ENLARGEMENTS

IVO MAES DISCUSSES THE  
WERNER AND DELORS  
REPORTS AND THE BIRTH  
OF THE EURO

URSULA VON DER LEYEN  
CALLS FOR GLOBAL  
COLLABORATION TO FIGHT  
SHARED CHALLENGES

THE EUROPEAN TRADE AND FINANCE PLATFORM

# CONTENTS

## A tale of two treatises

In the process towards European economic and monetary union, two reports played crucial roles. Ivo Maes focuses on the *Werner* and *Delors Reports*, capturing the key ideas and debates on the EMU process and the birth of the euro

## The first 25 years of the euro: a bird's-eye view

At 25 the euro area has shown extraordinary resilience. Marco Buti and Giancarlo Corsetti articulate a set of reforms to complete the euro area architecture

## Beyond money: the euro's role in Europe's strategic future

To ensure the euro's role in Europe's future Fabio Panetta argues that we need effective macroeconomic stability, a fully-fledged banking and capital market union, and a dynamic payments and market infrastructure

## Demystifying fears about bank disintermediation

The ECB's Governing Council has decided to proceed with the 'preparation phase'. Ulrich Bindseil, Piero Cipollone and Jürgen Schaaf focus on the debate around the impact of a digital euro on bank funding

## The economic outlook and monetary policy in the euro area

Luis de Guindos provides an overview of the latest economic developments and discusses the outlook for the euro area economy for the coming months

# CONTENTS

## *Aim far, act now*

Growth in the euro area needs to be revitalised. Reinhard Felke, Mirko Licchetta, Nicolas Philipponnet and Maarten Verwey argue that it is essential to boost investment and foster innovation

## *Heads I win, tails you lose*

Unremunerated reserves in the Eurosystem. Robert McCauley and Julien Pinter argue that turning huge remunerated excess bank reserves into zero-yielding required reserves is a tax on banks

## *Tax incidence and deposit relocation risks*

Unremunerated reserves in the Eurosystem. Robert McCauley and Julien Pinter argue that imposing unremunerated reserves on euro area banks would likely push bank intermediation offshore out of the euro area

## *Fighting inflation fairly and effectively*

A two-tier system of reserve requirements is needed to reduce the size of transfers to banks. Paul De Grauwe and Yuemei Ji answer their critics

## *Unresolved business*

Lucio Vinhas de Souza examines the institutional and financial implications of past and future EU enlargements and argues that the progress made towards Ukrainian accession has direct implications for the other candidate countries of Moldova and Georgia

# CONTENTS

## *To become a geopolitical player the EU needs treaty change*

Marek Dabrowski argues that the European Union will never become a serious geopolitical player without reducing national veto power

## *Decisions ahead and takeaways for the EU*

Alicia García-Herrero argues the EU should try to attract more business from Taiwan, though Taiwan's January 2024 election hasn't made the job easier

## *Asbestos: a time bomb that needs to be defused*

Asbestos is responsible for 90,000 deaths annually in Europe. Tony Musu presents a clear case for why it is time for the EU to defuse the asbestos time bomb once and for all

## *From laggard to leader?*

Isabel Schnabel emphasises the euro area's strengths in social protection and environmental initiatives, and advocates measure to close the euro area's technology gap

## *Accelerating strategic investment in the EU beyond 2026*

The EU has to manage the climate and digital transitions and achieve greater economic resilience. Maria Demertzis, David Pinkus and Nina Ruer discuss the potential EU approach to funding strategic objectives

## **Making industrial policy work**

The decarbonisation of the automotive industry is creating a skills shortage. Conor McCaffrey and Niclas Poitiers argue for the EU to get more involved in skill policies

## **Carbon leakage: an additional argument for international cooperation**

Climate change is a collective action problem that requires substantial international cooperation. Christofer Schroeder and Livio Stracca present new evidence that carbon taxes are undermined by 'leakage'

## **Europe's under-the-radar industrial policy**

Ben McWilliams, Giovanni Sgaravatti, Simone Tagliapietra and Georg Zachmann outline the trade-offs European governments must confront to meet the challenge of decarbonising their countries' economies

## **A call for global collaboration**

Ursula von der Leyen's message at the WEF is that countries and businesses need to closely collaborate in facing the challenges of today and tomorrow

## **Smarter European Union industrial policy for solar panels**

The EU plans to double solar PV capacity by 2030. Ben McWilliams, Simone Tagliapietra and Cecilia Trasi argue that the EU carry on importing from China but implement an industrial policy that intervenes in sectors that are more likely to contribute to sustainable economic growth

## **Entry and competition in mobile app stores**

The EU's Digital Markets Act opens up the possibility of increased innovation in app stores on mobile devices. Fiona Scott Morton examines the exciting potential benefits

## ***The EU AI Act: premature or precocious regulation?***

Governments around the world are creating regulation to come to grips with the perceived risks of AI. Bertin Martens writes that, as it stands, it is unknown whether the Act will stimulate responsible AI use or smother innovation

## ***The chicken-and-egg problem in the EU Digital Markets Act***

Business users are needed to help create useful interfaces, while useful interfaces are needed to justify investment and entry by business users. Fiona Scott Morton considers possible solutions to this dilemma

## ***Adapting the EU AI Act to deal with generative AI***

Generative AI might hold enormous promise. The EU's draft AI Act already needs to be revised to account for the opportunities and harms of generative AI, J Scott Marcus argues

# A tale of two treatises

In the process towards European economic and monetary union, two reports played crucial roles. Ivo Maes focuses on the *Werner* and *Delors Reports*, capturing the key ideas and debates on the EMU process and the birth of the euro

## 1 Introduction

Economic and monetary union in the European Union was informed to a great extent, at its beginning a quarter of a century ago, by two documents of great significance: the 1970 *Werner Report* and the 1989 *Delors Report*. These reports very much shaped Europe's debates on economic and monetary union (EMU) and as such have historical significance. But they can also help understand present policy issues and debates.

Economic and monetary union was not one of the objectives of the Rome Treaties of 1957, which established the European Economic Community alongside the European Atomic Energy Community. EMU was put on the European agenda in 1969 at the Hague summit of heads of state and government, where the objective of EMU was adopted officially.

To move it forward, an expert group, chaired by Luxembourg prime minister (and finance minister) Pierre Werner, was established. The group's report, commonly known as the *Werner Report*, specified both a vision of EMU and a path towards it.

Europe started on the path indicated in the *Werner Report*. However, little progress was made in the economically and politically turbulent 1970s and EMU disappeared from the agenda. Only in the second half of the 1980s did the EMU goal resurface. At the 1988 Hanover summit of heads of state and government, the objective of EMU was reaffirmed.

That summit established another expert group, comprising the central bank governors and chaired by Jacques Delors, then-president of the European Commission. The resulting *Delors Report* played a central role in the subsequent EMU debates and shaped very much the 1992 Maastricht Treaty, the basis for Europe's economic and monetary union.

Though the *Werner Report* and the *Delors Report* both presented visions of EMU and a path to get there, their approaches differed significantly. The *Werner Report* argued for an EMU with both a supranational monetary pillar (a European System of Central Banks) and a supranational economic pillar (a centre of decision-making for economic policy), reflecting the dominating Keynesian paradigm with a belief in discretionary fiscal policy.

*With the realisation of EMU, it is clear that policymakers succeeded in creating internal momentum, with a positive dynamic between policy initiatives and the working of market forces. Maybe there was also some luck involved, but there was certainly also a strong political will and leadership*

The focus of the *Delors Report* meanwhile was on the monetary pillar (an independent European System of Central Banks, with price stability as the objective of monetary policy), while there was scepticism about discretionary fiscal policy.

The Delors approach reflected a new consensus, as policymakers and academics had by then moved away from active demand-management policies and towards a medium-term orientation, with price stability as the fundamental aim of monetary policy.

Moreover, the new consensus emphasised structural, supply-side oriented policies, which had become popular with the Reagan administration in the United States and the Thatcher government in the United Kingdom. Major elements included the deregulation of product and labour markets, and privatisations.

This new paradigm facilitated agreement on EMU. As the perceived room for discretionary economic policies was more limited, it implied a more limited transfer of sovereignty (focused on monetary policy), than envisaged in the *Werner Report*.

In this essay, we pay particular attention to one of the background papers written for the *Delors Report*, *The Werner Report Revisited*, authored by the *Delors Report*'s two rapporteurs, Gunter Baer and Tommaso Padoa-Schioppa. Their paper showed how the Delors Committee took on the lessons from the experience of the *Werner Report*.

The analysis in this essay is partly based on original archival research in the Padoa-Schioppa archives at the European University Institute. The Baer and Padoa-Schioppa paper identified four intrinsic weaknesses of the *Werner Report*: absence of internal momentum, institutional ambiguities, insufficient constraints on national policies and an inappropriate (Keynesian) policy conception.

The *Delors Report* was clearly more successful than the *Werner Report* as it was on the basis of the *Delors Report* that EMU was realised. However, Europe's sovereign debt crisis in the twenty-first century showed that this *Delors Report*-based EMU was incomplete and that a strong economic pillar, as envisaged in the *Werner Report*, was missing.

Moreover, the issues of the lack of constraints on national policies and an appropriate policy conception remained very much open questions. In discussing EMU, it is important to keep in mind that decisions about monetary integration have always been taken at the highest level, by heads of state and government, as they involve crucial decisions about sovereignty.

EMU has then been 'high-level politics', with a special role for the Franco-German engine, not least Georges Pompidou and Willy Brandt at the 1969 Hague Summit, François Mitterrand and Helmut Kohl in the Maastricht Treaty process, and Angela Merkel and Nicolas Sarkozy during the euro area debt crisis.

The aim of this essay is not to offer a comprehensive history of the EMU process. With its focus on the *Werner* and *Delors Reports*, the aim is to capture some key ideas and debates. As the Werner and Delors Committees were composed of senior economic policymakers, it also focuses very much on the main technocrats in the EMU process. We also take the European Union's decision to go ahead with EMU as a starting point and we do not go into the question of whether Europe was an 'optimum currency area'.

The essay follows largely a chronological pattern, providing an overview of Europe's EMU process. After a short overview of the 1960s, we go into the *Werner Report*, the turbulent 1970s and the rise of the new, stability-oriented paradigm.

After that the focus is on the new dynamism in the European Union in the second half of the 1980s and the *Delors Report*. This led to the Maastricht Treaty, which offered a new framework for economic governance in the European Union. In the last sections we go into the functioning of EMU in the twenty-first century.

## **2 The golden sixties: high days of Keynesian economics and European integration**

At the beginning of the 1970s, economic thought among European policymakers was dominated by the experience of the golden sixties: strong economic growth, stable prices and the success of Keynesian demand management.

European economic integration also thrived in the 1960s, especially with the successful completion of the customs union, a key element of the Rome Treaty project (the common agricultural policy, the other main ambition of the Rome Treaty, was a more difficult issue). The launching of the monetary union project at the 1969 Hague Summit – on the basis of which the *Werner Report* was written – reflected this optimistic atmosphere.

The Keynesian economic orthodoxy of the post-war period emphasised very much budgetary policy. One of the foremost historians of Keynesian economics, Alan Coddington (1983), argued that the distinctive trait of Keynesianism is a utilitarian view of the public finances.

A prerequisite for taking such a utilitarian perspective of the public finances is that there must be a systematic, reliable connection between fiscal policy and effective demand in the economy, so typical for hydraulic Keynesianism, which dominated mainstream economic thinking in the postwar period.

Very influential in policy circles was a report, *Fiscal Policy for a Balanced Economy*, produced by the Organisation for Economic Cooperation. It was commonly referred to as the *Heller Report* (after the chair of the committee that produced the report, Walter Heller, a former Chair of John F Kennedy's Council of Economic Advisers).

In line with a utilitarian view of public finance, the *Heller Report* defined the role of fiscal policy as, “*not to balance the budget of the public sector, but to balance the economy as a whole*” (OECD, 1968, 15). According to the *Heller Report*, fiscal policy was the most important instrument for managing both the level and the composition of global demand in the economy.

Monetary factors were not considered to be of great importance. Leijonhufvud (1969, 13) described this period, especially the mid-1940s and extending into the 1950s and 1960s, as the Keynesian Revolution’s “*Anti Monetary Terror*” (see Maes, 1986).

In the Keynesian view, fiscal policy was the main instrument to steer aggregate demand in the economy. For fiscal policy to influence the level of real activity, a stable and reliable relationship between prices and output is necessary. This was found in the Phillips curve, showing a negative relationship between changes in prices and unemployment (Samuelson and Solow, 1960; Leeson, 1997).

According to the (simplified) Keynesian framework, the main task of policymakers was to determine the preferred trade-off between unemployment and inflation. Demand management, especially budgetary policy, would then be used to reach the preferred trade off. Consequently, every country had then a preferred national inflation rate.

In December 1969, at the European Community summit in the Hague, an ambitious programme to relaunch European integration was established, comprising both a widening of the Community (enlargement to include the United Kingdom, Ireland and Denmark) and a deepening (economic and monetary union).

Several factors contributed to the change in atmosphere that placed economic and monetary union in the spotlight and made it one of the Community’s official objectives. During the 1960s the customs union project, with the abolition of tariffs and quotas, was realised. At the end of the 1960s there was consideration of new projects.

Moreover, unease with the Bretton-Woods system was growing. French President Charles De Gaulle had always criticised the central position of the US dollar in the Bretton Woods system. During the second half of the 1960s, French officials, in order to attain a more balanced international monetary system, developed ideas about a European monetary identity (Haberer, 1981).

A key element was a type of exchange rate mechanism, to tie European currencies more closely together<sup>1</sup>. At the end of the 1960s, doubts about the future of the fixed exchange rate system became widespread, especially with the devaluation of the French franc in 1969 and the vulnerable position of the US dollar. The countries of the Community feared that further exchange-rate instability would lead to the disintegration of the customs union and the demise of the common agricultural policy.

Moreover, new political leaders had come to power. In 1969 de Gaulle resigned. His successor, Georges Pompidou, was more open to new European initiatives. In Germany, a new government was formed by the Social Democrats and the Free Democrats with Willy Brandt, a pragmatic but convinced pro-European, as Chancellor.

The Brandt government proposed the EMU project. Foreign policy motives were crucial. Germany wanted to demonstrate its European credentials, also to counterbalance its new Ostpolitik (developing relations with the Soviet Union and the communist countries of central and eastern Europe, with the recognition of the German Democratic Republic as a key element<sup>2</sup>).

One can observe here a notable similarity with the late 1980s, when the Kohl government favoured both German unification and advances towards European integration with the Maastricht Treaty.

### **3 The Werner Report**

After the Hague Summit, a committee, under the chairmanship of the Luxembourg prime minister (and finance minister) Pierre Werner, was set up to elaborate a plan for the creation of an economic and monetary union.

The members of the group were the Chairmen of the main economic policy committees of the European Community: the Monetary Committee (Bernard Clappier, French treasury), the Committee of Governors of Central Banks (Hubert Ansiaux of the National Bank of Belgium), the Short-term Economic Policy Committee (Gerard Brouwers of the Dutch economics ministry), the Medium-term Economic Policy Committee (Johann Baptist Schölhorn of the German economics ministry, with Hans Tietmeyer as his alternate), the Budget Policy Committee (Gaetano Stammati of the Italian finance ministry) and Ugo Mosca (representing the European Commission).

As one can see, with the chairmen of these policy committees, all the countries of the community were represented, except for Luxembourg. Having a prime minister as its chair reinforced the weight of the Werner Committee (Danescu, 2016).

The Werner Committee submitted its final report in October 1970 (Council Commission of the European Communities, 1970, hereafter referred to as the *Werner Report*). This report formed the basis for further discussions and decisions. It contained a programme for the establishment, by stages, of an economic and monetary union by 1980 (Danescu, 2018).

In the *Werner Report*, attention was first focused on the final objective of economic and monetary union. Thereafter, the realisation by stages was elaborated.

Looming over the *Werner Report* was a basic ambiguity concerning the crumbling Bretton Woods system. Unease with the Bretton Woods system was one of the driving forces for European monetary integration. However, the

European attempt to narrow exchange rate fluctuations took the framework of the fixed exchange rate system of Bretton Woods for granted.

The *Werner Report* first presented a very general picture of economic and monetary union: "*Economic and monetary union will make it possible to realise an area within which goods and services, people and capital will circulate freely and without competitive distortions, without thereby giving rise to structural or regional disequilibrium*" (*Werner Report*, 9).

The *Report* also offered a definition of a monetary union (which reflected very much a Bretton Woods perspective): "*A monetary union implies inside its boundaries the total and irreversible convertibility of currencies, the elimination of margins of fluctuation in exchange rates, the irrevocable fixing of parity rates and the complete liberation of movements of capital. It may be accompanied by the maintenance of national monetary symbols or the establishment of a sole Community currency*"<sup>3</sup>.

However, the *Report* favoured a single currency: "*From the technical point of view the choice between these two solutions may seem immaterial, but considerations of psychological and political nature militate in favour of the adoption of a sole currency which would confirm the irreversibility of the venture*" (*Werner Report*, 10)<sup>4</sup>.

To ensure the cohesion of economic and monetary union two elements were necessary: transfers of responsibility from the national to the Community level and a harmonisation of the instruments of economic policy in various sectors.

On the institutional plane, this implied the establishment of two new, supranational Community institutions: a centre of decision-making for economic policy and a Community system for central banks (very much like the Federal Reserve System in the United States)<sup>5</sup>.

The *Werner Report* took then a symmetric vision of EMU, with both a strong monetary and a strong economic pillar. The centre of decision-making for economic policy would exercise “*a decisive influence over the general economic policies of the Community*” (*Werner Report*, 12).

A key responsibility would be budgetary policy. While the *Werner Report* admitted that the role of the Community budget would remain limited, it emphasised that the centre of decision-making for economic policy should have a significant role in steering national budgetary policies: “*the essential features of the whole of public budgets, and in particular variations in their volume, the size of the balances and the methods of financing or utilizing them, will be decided at the Community level*” (*Werner Report*, 12).

Given these substantial transfers of sovereignty to the Community level, the *Werner Report* argued that there should also be a corresponding transfer of parliamentary responsibility from the national to the Community level. The centre of decision-making for economic policy would be responsible to the European Parliament.

This implied a fundamental reform of the European Parliament, “*not only from the point of view of the extent of its powers, but also having regard to the method of election of its members*” (*Werner Report*, 13).

However, the *Report* did not enlarge very much on these new institutional structures (it did “*not consider that it will have to formulate detailed institutional proposals as to the institutional form to be given to the different Community organs*”; *Werner Report*, 12).

The *Werner Report* underlined the fundamental political significance of transfers of responsibility to the Community level and came out in favour of a political union: “*Economic and monetary union thus appears as a leaven for the development of political union, which in the long run it cannot do without*” (*Werner Report*, 12).

The *Werner Report* also paid attention to structural and regional policies. It expressed an awareness that differences in the economic structures of countries might cause problems for the functioning of EMU. Structural and regional policies were then important, also at Community level: "*In an economic and monetary union, structural and regional policies will not be exclusively a matter for national budgets*" (*Werner Report*, 11).

In this context, it raised the issue of environmental problems, which should be "*treated at Community level under their various technical, financial and social aspects*" (*Werner Report*, 11).

Concerning financial issues, the *Werner Report* argued for a true European capital market. This implied the free movement of capital and financial services. The *Report* further noted that: "*The financial policy of the member states must be sufficiently unified to ensure the balanced operation of this market*" (*Werner Report*, 11). It did not further discuss this, nor did it discuss financial stability issues (banking and financial crises were not really an issue during these years).

To reach economic and monetary union, the *Werner Report* proposed a three-stage plan. This gradualist approach towards economic and monetary union was laid down by the heads of state and government at the Hague Summit and was typical for the process of European integration.

The *Werner Report* did not lay down a precise timetable for the whole of the plan. Rather it wanted to maintain a measure of flexibility, while concentrating on the first phase. It proposed that the first stage would start on 1 January 1971 and would take three years.

The main elements were: (a) a reinforcement of procedures for consultation and policy coordination; (b) a further liberalisation of intra Community capital movements and steps towards an integrated European capital market;

(c) a narrowing of exchange-rate fluctuations between Community currencies (compared to the Bretton Woods framework).

On the second stage, the *Werner Report* was vague. The main element was “*the promotion on a number of fronts and on ever more restrictive lines of the action undertaken during the first stage*” (*Werner Report*, 28). The Report also proposed establishment of a European Fund for Monetary Cooperation. However, it was left open whether this would be in the first or second stage. The third stage would then be the establishment of economic and monetary union.

Of fundamental importance in the *Werner Report* was the concept of ‘parallel progress’. This notion formed a compromise between the so-called ‘monetarists’ (emphasising greater exchange rate stability and European exchange rate support mechanisms, with France as an important advocate) and the ‘economists’ (emphasising the coordination of economic policies and economic convergence, led by Germany). This notion enabled the Werner Group to present a unanimous report (Tsoukalis, 1977, 101).

#### **4 Economic debates and growing divergencies in the early 1970s**

The *Werner Report* triggered intense discussions among policymakers and in academic circles. A major issue was the feasibility of economic and monetary union. Many eminent economists expressed their scepticism with respect to the feasibility of the proposals contained in the *Werner Report*.

Macroeconomic discussions in the early 1970s typically took place in a ‘Phillips curve world’ (De Grauwe, 1975), which assumed a stable relationship between inflation and unemployment. Differences in inflation between countries could then be traced to three main factors: (a) the position of the Phillips curves (trade union aggressiveness, structural factors affecting unemployment, etc.); (b) the rates of productivity growth; (c)

the preferences of governments in relation to unemployment and inflation. Every country has then a “*national propensity to inflation*” (Magnifico, 1972, 13).

The economic policy choice of the government is of crucial importance. In this type of world, inflation rates between two countries will only be equal by accident.

Naturally, differences in inflation rates would lead to balance-of-payments imbalances, which were incompatible with fixed exchange rates. As observed by Fleming (1971, 467): “*The principal danger involved in participating in a fixed rate area arises from the certainty, in the absence of perfect competition in product and factor markets, that developments would occur from time to time that pushed the relative cost levels of the participating countries out of line.*”

Monetary union would then force a country to accept a trade-off between unemployment and inflation that it considered suboptimal. The country would be forced to sacrifice its internal balance for exchange-rate unification.

Europe’s monetary union project quickly ran into significant difficulties. The proposal for supranational European institutions was not well received in France. Immediately after its publication, Pompidou got angry at reading the *Werner Report*, while Maurice Schumann remarked: “*Il ne faut pas compromettre l’union économique et monétaire des Six par un fatras institutionnel prématué*” (“*The economic and monetary union of the Six must not be compromised by a premature institutional mix-up*”; Werner, 1991, 132).

However, the removal of these institutions in subsequent Commission proposals was not well received in Germany. Moreover, the new European exchange rate system quickly turned into a de-facto German mark zone. The European Commission asked a group of experts, chaired by former Vice-president Robert Marjolin, to make an assessment of the situation.

The 1975 *Marjolin Report* was very hard and described the situation as a ‘failure’. It summarised the overall development between 1969 and 1975 as: “*if there has been any movement it has been backward*” (CEC, 1975, 1).

An important factor behind these difficulties was that the international environment had become very hostile with the collapse of the Bretton Woods system and the first oil shock. The breakdown of the Bretton-Woods fixed exchange rate system implied that economic policies, especially monetary policy, no longer had to be geared in function of the exchange rate against the dollar. This implied that policymakers had to find a new nominal anchor for their policies.

Moreover, it contributed to a growing indebtedness in the world economy, as there were fewer constraints on economic policies (de Larosière 2018). The first oil price shock of October 1973 challenged Western dominance in the world economy – it can be regarded as a first manifestation of the so-called ‘Global South.’

The severe turmoil in the world economy contributed to a serious worsening of Europe’s economic performance in the 1970s. Inflation and inflation divergence between countries rose, and economic growth slowed significantly. Europe’s stagflation crisis had started. With growing inflation divergence, the European exchange rate system quickly ran into problems and several countries had to leave the system.

An important factor was that Europe’s governments reacted very differently to the crisis, especially the increase in oil prices. For German policymakers, the oil shock was essentially an inflationary shock, to be contained with restrictive policies. The French considered, in the first instance, that this might lead to a recession (as the French economy became poorer due to the deterioration of the terms of trade, it might lead to a reduction in demand) and pursued more expansionary policies.

So, divergence in inflation rates soared, making fixed exchange rates unsustainable. The European exchange rate system had then a turbulent existence: there were several realignments of parities and many currencies dropped out. From January 1974, after the French departure, it was generally considered as a de-facto German mark zone (notwithstanding a return of the French franc from July 1975 to March 1976).

## **5 The stagflation of the 1970s and the rise of a new economic paradigm**

While Keynesian economics was still dominant in the 1960s, a new economic paradigm had been gaining in importance. In the academic world, the so-called 'Monetarist Counter Revolution' had already questioned the Keynesian framework. One might distinguish three stages in these academic controversies.

In the first stage, discussions centred around the determination of nominal demand, with monetarists, such as Milton Friedman (1973), emphasising the money supply and not budgetary policy as the main determinant of effective demand.

In a second stage, attention shifted towards the functioning of the labour market with monetarists attacking the Phillips curve, arguing that the curve shifted when workers adjusted their inflation expectations (Friedman, 1968). The Phillips curve did not provide then a stable relationship between prices and unemployment.

In the third phase, the formation of expectations became the focal point, with the rational-expectations hypothesis, implying that a change in policy could alter the behaviour of economic agents (Lucas, 1976).

Gradually then, a new policy conception emerged, in which monetary policy was geared principally against inflation and inflationary expectations. While, after the breakdown of the Bretton Woods system, smaller countries continued with exchange-rate pegs, bigger countries started using the money supply as an intermediate target of monetary policy, in line with monetarist ideas.

In Europe, the Konstanz Seminars played an important role in the spread of monetarism, also in the transmission of monetarist ideas to policymakers. The first seminar was organised in June 1970 at the University of Konstanz by Karl Brunner, one of the most eminent monetarists (even if he is less well known than Milton Friedman).

Among the participants was Helmut Schlesinger, a future president of the Bundesbank (Neumann, 1972, 30). The Bundesbank, where Schlesinger became president, set its first money-supply target in December 1974, for the year 1975.

Among policymakers, especially in France, the oil shock of 1973 and the ensuing stagflation were of fundamental importance, leading to changes in their conceptions of economic policy. The crisis showed very clearly the openness of the economy and its vulnerability to external developments.

The oil shock was a, more or less fatal, blow to the French planning experience. French policymakers became more and more aware that there were limits to activist policies, and that France had to take into account the external constraint.

During the second half of the 1970s, under the prime ministership of Raymond Barre, French economic policies became more stability oriented. The exchange rate was a crucial element in the strategy to instil discipline in the French economy. Barre also pushed through measures to liberalise prices.

This reorientation of French economic policy was an important reason why German policymakers consented to the creation of the European Monetary System (EMS) in 1979. The EMS can then be considered as a case of 'parallel progress', towards exchange-rate stability and stability-oriented policies, as requested in the *Werner Report*.

The stagflation of the 1970s gave rise to substantive discussions among economic policymakers, also at the world annual economic summits, which were initiated in 1975, and at the European level. At the Group of Seven (G7) summit in Bonn in May 1978, a coordinated macro-economic strategy at global level, pushed by US president Jimmy Carter, was drawn up.

It led to the so-called 'concerted action', through which Germany agreed to boost its economy with a budgetary package of 1 percent of GDP. It showed that the golden sixties, with its strong economic growth performance associated with Keynesian demand management policies, remained an important reference framework against which many policymakers still approached the economic problems of the 1970s.

However, the more expansionary budgetary policy in 1979 and 1980 coincided with an economic recovery, working pro-cyclically. This created a severe trauma, especially in Germany (which was confronted with a balance-of-payments deficit), and in international institutions including the Organisation for Economic Co-operation and Development and the European Commission, which were important advocates of policy coordination.

The failure of the budgetary stimulus raised the issue of the efficiency of economic policy and made economists much more sceptical about possibilities for fine tuning policy. The failure of macroeconomic policy coordination at the end of the 1970s then became an important element leading to a reformulation of the strategy of economic policy in the early 1980s.

An example of the reflections and discussions among policymakers after the failure of the concerted action can be found in the 1980 *Annual Economic Report of the European Commission*, which marked a break compared to earlier studies (Maes, 1998). At the centre of the report was the shift in economic policy orientation, away from active demand management policies and towards a more medium-term orientation, emphasising structural, supply side oriented policies.

The new policy orientation was clearly set out in the report's introduction: "*While in the past economic policy was often perceived as a problem of demand management, in a world based on the assumption of unlimited supply of energy and raw materials, the importance and critical value of supply constraints and structural adjustment problems are now evident*" (CEC, 1980, 9).

The break with the past, and the medium term orientation of economic policy, was further illustrated and elaborated: "*The concerted response to the present general economic situation should be based on the right strategic mix of demand and supply policies and notably the right balance in their application to short- and medium term problems. Short-term adjustments should be more moderate than at times in the last decade, and a heavier weight has to be given to reducing medium term inflationary expectations and improving supply conditions in the economy*" (CEC, 1980, 13, original emphasis).

This implied a shift away from discretionary demand management in favour of a medium-term orientation with an important role for monetary aggregates, as well as a focus on improving the growth potential of the economy, with attention paid to the structure of public expenditure, taxation and regulation.

The report further offered a thorough analysis of the limits of demand-management policy. Several elements were analysed, starting with the external constraint and time lags. Moreover, behind the new policy orientation was a new view of the functioning of the economy, moving away from the mechanical Keynesian paradigm. Policymakers were influenced by debates in the academic world. A first element concerned the Lucas critique (that a change in policy could alter the behaviour of economic agents) and rational expectations.

This implied that economic agents were not responding in a mechanical or 'Pavlovian' way to changes in economic policy. Policymakers had to be aware that markets would anticipate policy measures. This further undermined the belief in the possibility of fine tuning the economy and led to a greater emphasis on medium term policies.

Moreover, monetary policy was, in the long run, not independent of budgetary policy, via the financing of public deficits. This was very much the experience of the 1970s, when stagflation contributed to increasing budget deficits, which, to a great extent, were financed by money creation (an experience that would haunt the Delors Committee).

The changes in economic policy conceptions were further supported by new advances in economic theory. Building on monetarist and rational expectations theories, the literature on time-inconsistency pointed further to the inflationary bias of a discretionary monetary policy (Barro and Gordon, 1983).

To retain flexibility, while dealing with the inflationary bias of a discretionary policy, central-bank independence quickly topped the research agenda (Fischer, 1994). Moreover, empirical studies indicated that central-bank independence went together with better inflation performance (Grilli *et al* 1991). Central-bank independence became a key theme not only in German ordoliberalism, but also an important element of mainstream economics.

The Phillips curve disappeared from the debates. The way then to improve the trade-off between inflation and growth was to take measures on the supply side of the economy. A major element of these supply-side policies was privatisation, which started in Europe with the Thatcher government in the United Kingdom in 1979.

In France, when Mitterrand came to power, he implemented a large-scale nationalisation programme. Privatisations began in France during the first 'cohabitation' (a socialist president sharing power with a Gaullist government), with Balladur as finance minister in 1986.

Multilateral forums, including the European Union, the OECD, the Bank for International Settlements and the International Monetary Fund, contributed greatly to the dissemination of these new ideas on stability-oriented policies. Senior French and German officials met regularly, not only bilaterally, but also in these international settings.

This contributed to the growth of a kind of epistemic community. Policymakers met often, sometimes also with academics, and their debates would be prepared by their research departments, so that academic ideas were also taken up by policymakers. This contributed to a growing consensus on ‘sound money’ policies.

The emergence of this consensus on stability-oriented policies also took the heat out of the old debate about the sequencing of the monetary integration process: whether priority should be given to exchange-rate stability or policy coordination.

Parallel progress, as requested in the *Werner Report*, became natural. Policymakers in both Germany and France followed stability oriented policies. For French policymakers the exchange rate, the ‘franc fort’, became an important anchor for their economic policies.

So, at the end of the 1970s a shift occurred in Europe from a more activist policy towards a strategy based on medium term stability, market-oriented policies and emphasis on measures enforcing the supply side of the economy. The shift was apparent in all major European countries.

The clearest break was in the United Kingdom, with the election victory of Margaret Thatcher in 1979. In Germany, a more conservative government was formed in 1982 under Helmut Kohl. However, a major change in fiscal policy had occurred already in 1981 under his socialist predecessor, Helmut Schmidt.

In France the change occurred somewhat later, given the election victory of Mitterrand in 1981. After 18 months of a rather disastrous experiment in policy activism, the socialists reoriented their economic policy in a much less interventionist way.

## **6 The European Community in the 1980s: from eurosclerosis to a new dynamism**

The early 1980s was a time of morosity in the European Union: the economy was in the doldrums and the integration progress was stalling. Europe's economic performance in the early 1980s was disappointing: economic growth was low and unemployment was increasing strongly, while inflation was high and declined only stubbornly.

An important factor was certainly the second oil shock in the autumn of 1979, which acted as a stagflationary shock to Europe's economy. But the European performance contrasted also markedly with the situation in the United States, where the recovery, from 1983 onwards, was very strong and unemployment started declining, something that observers associated with President Reagan's supply-side economics. 'Eurosclerosis' was the term used to characterise the economic situation in the Community (Giersch, 1987).

The European integration process was also in the doldrums. The dominant issue in the European debate in the first half of the 1980s was the British contribution to the European budget, crystallised in Mrs Thatcher's famous phrase, "*I want my money back.*" A solution was only reached at the Fontainebleau summit in June 1984, clearing the way for the European Community to concentrate on projects that would further integration.

The appearance of morosity in the European Community was further reinforced by the rather lacklustre performance of the Thorn Commission (1981-1984), which did not take noticeable initiatives to further the European integration process.

The main impetus to the integration process came from the European Monetary System (EMS), which was founded in March 1979 (Ludlow, 1982). In the mid-1970s, European monetary integration languished after the unravelling of the exchange rate system, while discussions about the place of the United Kingdom dominated the European scene.

Roy Jenkins, then president of the European Commission, tried to revive the monetary union project, especially in a famous speech in Florence (Jenkins, 1977). The following year, the French president Valéry Giscard d'Estaing and the German chancellor Helmut Schmidt played a crucial role in the relaunch of the monetary integration process with the creation of the European Monetary System.

The European Monetary System was agreed by the heads of state at the Brussels summit in December 1978. Formally, the EMS started in March 1979. However, the European Monetary System was an intergovernmental agreement (Delors, 2006).

It was also a more modest project, when compared to the ambitions of the Werner plan (it is noteworthy that the free movement of capital was absent from the EMS). Moreover, the first years of the EMS were very difficult: there was a lack of convergence of economic policies and performances, especially inflation, and there were several realignments (Mourlon-Druol, 2012).

The development of the EMS was one of the main preoccupations of economic policymakers at the European Commission. Tensions in the EMS were exacerbated from May 1981, when Mitterrand, the new French President, followed an isolated Keynesian policy strategy.

This led to a loss of competitiveness of the French economy, capital outflows and speculative pressures against the French franc, leading to several realignments. After the March 1983 realignment and the change towards more orthodox economic policies in France, the EMS came into calmer waters.

Things would change in January 1985 with the Delors Commission, which developed several projects to reinvigorate the European economy and the integration process. Of special importance was the internal market

project. Before Jacques Delors became president of the European Commission, he toured the member states, discussing ideas to relaunch European integration.

A renewed campaign for a European internal market emerged as the most favoured option, as it fitted in with the general tendency towards deregulation. A single European financial market was a key element of this (Maes, 2007). It comprised the free movement of capital, which had always been a crucial German condition for progress in the area of monetary integration.

The Community adopted the single market programme. It became a Treaty obligation with the adoption of the Single European Act, the first major revision of the Community's founding Treaties. The Act extended greatly the scope of the Community and simplified the decision-making process (with qualified majority voting instead of unanimity for most of the internal-market measures). The Act constituted an early and crucial triumph for the single market project, and further contributed to the renewed momentum of the Community.

The internal market programme was also part of the Commission's more general economic policy strategy, which aimed at strengthening the foundations of the economy (Mortensen, 1990, 31). Other important elements of this strategy were wage moderation, budgetary consolidation and increasing the flexibility of markets.

During these years, a new view on industrial policy also took shape (Maes, 2002). Industrial policy figured prominently on the policy agenda of the Community in the 1970s, focused on supporting sectors confronted with problems, such as the steel industry.

In the 1980s and 1990s, the emphasis shifted towards a more horizontal industrial policy, with the creation of a favourable environment for firms, and towards competition policy. This also contributed to the reinforcement of the internal market.

Delors requested a report by a study group, chaired by Tommaso Padoa Schioppa, on the implications of the internal market for the future of the Community, which was published with the title *Efficiency, Stability, Equity* (Padoa Schioppa, 1987).

Padoa Schioppa had been a director general of DG II (the economic service of the Commission) at the end of the 1970s and the early 1980s (Maes, 2013). During that period, he got to know Delors, who was then chairman of the European Parliament's economic and monetary committee. After his stay in Brussels, Padoa Schioppa returned to the Banca d'Italia, but remained in close contact with Delors.

The title of the report, *Efficiency, Stability, Equity*, referred to the classic work of Richard and Peggy Musgrave (1973) on public finance, which distinguished between the three main tasks of fiscal policy: improving the allocation of resources, contributing to greater (macroeconomic) stability, and improving the income (and wealth) distribution.

The Padoa-Schioppa report contained a warning that the single market (with not only the free movement of goods, but also the liberation of capital movements), was inconsistent with the prevalent combination of exchange-rate stability and national autonomy of monetary policy (a thesis Padoa Schioppa called "*the inconsistent quartet*"; Masini, 2016).

The European Community continued with the internal market momentum. At a summit in Hanover in June 1988, economic and monetary union was brought back on the agenda. The heads of state and government decided to set up a committee with the task of studying and proposing concrete steps leading towards economic and monetary union.

This committee, mainly composed of central-bank governors and chaired by Jacques Delors, produced its report in April 1989 (*Report on Economic and Monetary Union in the European Community*, Committee for the Study of Economic and Monetary Union (1989), hereafter referred to as *Delors Report*).

As observed by Alexandre Lamfalussy, a member of the Delors Committee and later the first President of the European Monetary Institute, the central-bank governors were not in favour of a monetary union: “*There never would have been a single currency if the decisions had been left to the central banks. Never. [...] The motivation was political, and one man who played a very important role in persuading people was Jacques Delors*” (Lamfalussy et al 2013, 134).

Delors convinced the heads of state and government not only to establish the committee with the central bankers on it, but also to limit the mandate of the committee to the means of achieving EMU. As Lamfalussy further observed, Delors had got the European Council to “*task a group dominated by central banks with preparing the way for the bankers' own suicide. It was absolutely inspired*” (Lamfalussy et al 2013, 135). One of the first studies for the *Delors Report* was a paper on the *Werner Report* titled *The Werner Report Revisited*.

As observed by James (2012, 242), it was part of a “*carefully planned strategy*” by Delors.

## **7 The Werner Report Revisited**

Besides its members, four persons played important roles in the work of the Delors Committee: the two rapporteurs – Gunter Baer and Tommaso Padoa-Schioppa – and two close collaborators of Delors, Joly Dixon and Jean-Paul Mingasson. As mentioned, Padoa-Schioppa was an old friend of Delors and he later became a founding member of the European Central Bank Executive Board and Italian finance minister.

Gunter Baer was a German who worked with Lamfalussy at the Bank of International Settlements. Joly Dixon, a British citizen, was a member of Delors's private office, where he was responsible for the EMU dossier. Mingasson, a French citizen, was a Deputy Director General at DG II, where he was responsible for the monetary directorate (which reported directly to Delors)<sup>6</sup>.

In the Padoa-Schioppa archives there is a copy of the Werner Report with the annotations by Padoa-Schioppa (hereafter TPS, with the archive referred to as TPSA). These notes show very well some of TPS's main ideas about EMU and the process for getting there. TPS considered as critical that the growing interpenetration between the economies would limit the autonomy of national business-cycle policies (TPSA-184, WR, 8).

For the quantitative orientations (or policy guidelines) which were foreseen for budgetary policy in the *Werner Report*, he noted "*nessun vero vincolo*" (no real constraint) (TPSA-184, WR, 8). Concerning the technical harmonisations for policy coordination with respect to the financial markets, he wrote "*vago! vago!*" (vague) (TPSA-184, WR, 22).

Concerning the narrowing of exchange rate fluctuations, he noted "*non si sa quando*" (one does not know when) (TPSA-184, WR, 24). The remarks already show some of the main lines of *The Werner Report Revisited*.

The preparatory work for the Delors Committee started quickly after the Hanover summit. Dixon produced a first note on the *Werner Report* on 14 July, followed by a note by Mingasson on 18 July and a new note by Dixon on 22 July.

This last note identified four 'intrinsic weaknesses' of the *Werner Report*: a lack of institutional ambition; an excessively mechanical conception of policymaking; an over-emphasis on the importance of the harmonisation of

policy instruments; and a lack of clarity over the independence of the conduct of monetary policy (TPSA-184, fax from Dixon to TPS, 26 July 1998). On 28 July, Dixon produced a new note (of seven pages) with the title *The Werner Report Revisited*.

On 2 August, TPS sent a four-page note with comments. He emphasised that the main message of the paper should be that stages one and two of the *Werner Report* had been implemented but that "if the results had not been as good as hoped", three elements were important: lack of institutional change; lack of a dynamic element; and an unfavourable economic environment.

A key argument of TPS was that: "*The Werner approach is essentially 'coordination and recommendation' rather than 'institution and decision'*" (TPSA-184, fax from TPS to Dixon, 2 August 1998). The paper went through some further drafting sessions and was discussed at the first meeting of the Delors Committee in September 1988.

The *Werner Report Revisited* is divided in four sections: 'Main features of the Report', 'Follow-up to the Report', 'An assessment' and 'The post-Werner period'. Already in the first section the tone was set with two key messages: the *Werner Report* did not pay attention to the process of achieving EMU and did not consider much the institutional structure of EMU (Baer and Padoa Schioppa, 1988, 53).

In the assessment section, the paper highlighted, besides the difficult international environment, four significant weaknesses of the *Werner Report*:

- (a) "*Insufficient constraints on national policies.*" The *Werner Report* was too much based on voluntary agreements and guidelines: "*insufficient constraints on national policies*" was one of the *Werner Report's* main flaws: "*These guidelines had the character of recommendations and there was no provision to ensure their*

*observance. Such an approach could work only as long as there was a sufficiently strong policy consensus and willingness to cooperate. However, once that consensus began to weaken, more binding constraints on national policy would have become necessary*" (Baer and Padoa-Schioppa, 1989, 57);

- (b) "*Institutional ambiguities.*" It was not always clear who was responsible for which decision;
- (c) "*Inappropriate policy conception.*" The *Werner Report* was based on a very high degree of confidence in the ability of policy instruments to affect policy goals in a known and predictable way. "*This over-optimistic view of the efficacy of economic management gave rise to a rather mechanistic and relatively rigid approach to policy coordination (especially in the budgetary field).*" This was typical for the, then dominant, hydraulic Keynesian paradigm;
- (d) "*A lack of internal momentum.*" The *Werner Report* did not envisage an interactive process in which the implementation of certain steps would trigger market reactions that in turn would necessitate further steps towards economic and monetary union.

The paper further emphasised that significant progress had been achieved in the European integration process and that a new policy consensus had been established. It observed that, while at the end of the 1960s there was an agreement on "*medium-term planning and fine-tuning*", the stagflation of the 1970s had led to a paradigm change: "*a new consensus had developed in which attention has shifted towards medium-term financial stability, the supply side of the economy and structural policies*" (Baer and Padoa Schioppa, 1988, 58).

In the conclusion, the paper further emphasised that "*the full potential of the single market will only be realized with satisfactory monetary arrangements*" (Baer and Padoa Schioppa, 1988, 60).

## **8 The Delors Report**

The *Delors Report* played a crucial role as a reference and anchor point in further discussions, just as the *Werner Report* had nearly two decades earlier. It was an important milestone on the road to the Maastricht Treaty, which provided the constitutional framework for Europe's economic and monetary union (Dyson and Featherstone, 2000).

Like the *Werner Report*, the *Delors Report* revolved around two issues: first, which economic arrangements are necessary for a monetary union to be successful; and, second, what gradual path should be designed to reach economic and monetary union.

Initially, the relationship between Delors and Karl-Otto Pöhl, the President of the Bundesbank, was rather tense. However, Delors's main aim was to finalise a unanimous report (Maes and Péters, 2020). So he took a low profile and focused on seeking consensus in the committee.

As observed by Dixon, Delors "took it very gentle. We started with history; we went back to the *Werner Report*; we went very very gentle" (JDI, 11). Delors also asked Pöhl to sketch out his vision for a future EMU, something Pöhl could not refuse. As observed by Lamfalussy, with that manoeuvre, Delors rendered Pöhl and the Bundesbank "captive" (Lamfalussy *et al* 2013, 136).

In his contribution, Pöhl took a 'fundamentalist' position and emphasised the new monetary order that had to be created: "Above all agreement must exist that stability of the value of money is the indispensable prerequisite for the achievement of other goals. Particular importance will therefore attach to the principles on which a European monetary order should be based" (Pöhl, 1988, 132).

He argued for price stability as the prime objective of monetary policy, which had to be conducted by an independent central bank. Pöhl further emphasised the "*indivisibility of monetary policy*", that decisions should be

taken either at the national level or by a common central bank. In defining the necessary conditions for a monetary union, the *Delors Report* referred to the *Werner Report*. On the institutional level, the *Delors Report* proposed the creation of a ‘European System of Central Banks’.

Pöhl’s fundamentalist approach was deeply influential in the *Delors Report* and inspired a number of principles that also figured prominently in the Maastricht Treaty (Padoa-Schioppa, 1994, 9). The Delors Committee took great care to work out first its view on the final stage of EMU, especially the monetary pillar. This was a major contrast to the Werner Committee.

The *Delors Report*’s European System of Central Banks was to be responsible for the single monetary policy, with price stability as the ultimate aim. In the discussions on the independence of the central bank, Pöhl received valuable support from Jacques de Larosière, for whom the Delors Committee presented an opportunity to increase the independence of the Banque de France (Maes and Péters, 2021).

During the second meeting, Lamfalussy raised the crucial issue of whether the necessary fiscal discipline could be left to market forces. He questioned strongly whether one could rely on the financial markets to ‘iron out’ the differences in fiscal behaviour between member countries.

With his experience as a commercial banker and having lived through the Latin American debt crisis, he questioned whether the interest premium to be paid by a high-deficit country would be very large. Moreover, even if there was a premium, he doubted that it would be large enough to reduce significantly the deficit country’s propensity to borrow (James, 2012, 249).

In a paper on the coordination of fiscal policies, which he prepared for the committee, Lamfalussy (1989) not only went into the economic theory, but also provided an overview of the experiences of federal states. He concluded that fiscal policy coordination was a “*vital component for a European EMU*” (Lamfalussy, 1989: 93).

The two aims of coordination should be a European fiscal policy stance that was appropriate for the European and international environment, and avoiding tensions from excessive differences between national fiscal policies. Lamfalussy observed that ‘misalignments’ between national fiscal policies could, in principle, be remedied in two ways: via the community budget or by limiting the scope of national discretion in budgetary policies.

In a footnote, Lamfalussy (1989: 95) referred to the classic work of Musgrave and Musgrave (1973) on public finance. He noted that, given the difficulties in coordinating economic policies, the academic literature typically argued for giving the stabilisation function to the federal level.

During the discussions in the committee, Lamfalussy argued for a “*Centre for Economic Policy Coordination*.” This idea was, however, not taken up in the *Delors Report*. The report argued for “*both binding rules and procedures*” in the area of budgetary policy (*Delors Report*, 28). The economic pillar of EMU remained a difficult issue<sup>7</sup>.

It is further interesting to note that, during the discussions in the Delors Committee, Lamfalussy (and Wim Duisenberg, the President of the Dutch central bank) also argued in favour of giving the European Central Bank a role in the area of banking supervision (Minutes of the fourth meeting of the Delors Committee on 13 December 1988, DCA).

However, they did not really pursue this issue and the *Delors Report* only mentioned that the new system “*would participate in the coordination of banking supervision policies*” (*Delors Report*, 26).

To attain economic and monetary union the Delors Committee proposed three stages. In contrast to the emphasis by the *Werner Report* on the first stage, all three stages were worked out in the *Delors Report* in considerable detail.

These stages implied, from an institutional and legal point of view: the preparation of a new Treaty (first stage), the creation of a new monetary institution (European System of Central Banks, second stage), and the transfer of responsibilities to this new institution (third stage). From an economic and monetary point of view, these stages implied increased convergence and closer coordination of economic policy.

However, the committee underlined the indivisibility of the whole process: “*the decision to enter upon the first stage should be a decision to embark on the entire process*” (*Delors Report*, 31).

In a note for Belgian finance minister Philippe Maystadt, Edgard Van de Pontseele, the Director of the Belgian Treasury, went into the significance of the *Delors Report*.

In his view, this was not in the intellectual contribution of the report nor in its proposal for the path towards EMU. For him the main novelty was the unanimity with which the central-bank governors had accepted the report (*Verslag over de economische en monetaire eenheid in de Europese Gemeenschap*, sd, BSA). He emphasised two elements: it would be the governors who would lose their powers with the establishment of a European Central Bank; and the argument that the project was technically not sound had become invalidated.

The European Community followed the path indicated in the *Delors Report*. The first stage started in July 1990 and the intergovernmental conference on economic and monetary union, along with another on political union, opened in Rome in December 1990.

Meanwhile, the broader European scene was changing dramatically with the breakdown of the iron curtain and German unification, contributing to the speeding up of the process of European monetary integration. The German government's policy line could almost be summarised in Thomas Mann's dictum: "*Wir wollen ein europäisches Deutschland und kein deutsches Europa*" ("We want a European Germany and not a German Europe"; Schönfelder and Thiel, 1996, 12).

## **9 The Maastricht Treaty: a new economic governance framework**

The intergovernmental conferences reached their climax at the Maastricht Summit in December 1991. The Maastricht Treaty marked a step forward for the European Community in the same way that the Treaty of Rome had done. It created a so-called European Union, based on three pillars (Maes, 2007).

The first pillar had at its core the old Community but carrying greatly extended responsibilities with it. The main new element was economic and monetary union. The second pillar was for foreign and security policy. The third concerned cooperation on topics such as immigration, asylum and policing. The new Treaty also extended the powers of the European Parliament.

Economic and monetary union had a kind of asymmetrical structure. Monetary policy was centralised. It was the responsibility of the European System of Central Banks (ESCB), composed of the European Central Bank and the national central banks, which are all independent. The primary objective of monetary policy is price stability. Without prejudice to the objective of price stability, the ESCB must support the general economic policies in the Community.

This part of the Treaty went quite smoothly through the intergovernmental conference. The preparations in the Delors Committee and the Committee of Central Bank Governors certainly contributed to this. The prominence of the German institutional model was also evident.

Several factors contributed to this: the sheer size of Germany and the Deutsche mark; strong theoretical support, based on a blend of German ordoliberal and mainstream economics ideas; the successful history of German monetary policy; the strong bargaining position of the German authorities and the unique federal structure of the Bundesbank.

However, with the anchoring of price stability and central bank independence in a treaty, the Maastricht Treaty went further than the German situation, giving these principles a constitutional status – “*a pre-eminence unparalleled in legal history*” (Herdegen, 1998, 14).

The responsibility for other instruments of economic policy, including budgetary policy and incomes policy, remained basically decentralised, resting with the national authorities. However, member states had to regard their economic policies as a matter of common concern and coordinate them accordingly<sup>8</sup>. However, as history would show, there was a repeat of “*insufficient constraints on national policies*” as The *Werner Report Revisited* had warned.

During the Maastricht Treaty negotiations there were hard negotiations on a European economic government. However, the topic was divisive and the transfer of sovereignty for economic policy was not acceptable for the member states. The consequence was an EMU with a well-developed monetary pillar but a weak economic pillar (Maes, 2004).

The different characteristics of monetary union and economic union reflected the limits of the willingness of the member states to give up national sovereignty. As Bordo and Jonung (2000, 35) observed, EMU is quite unique in history, being a monetary union while countries retain political independence.

The budgetary policy coordination process and the responsibility for exchange-rate policy were the topics of some of the tensest discussions during the intergovernmental conference. France proposed a '*gouvernement économique*', whereby the European Council would provide for broad guidelines for economic policy, including monetary policy.

This provoked a strong clash with Germany, for which the independence of the European Central Bank was not negotiable. However, the Germans were also convinced of the necessity of coordination of other economic policies, especially budgetary policy, as they determine the environment in which monetary policy must function<sup>9</sup>.

Agreement was only reached after intense negotiations, including secret bilateral discussions between the French and the Germans (Dyson and Featherstone, 1999).

An important topic in the later EMU negotiations was the Stability and Growth Pact (SGP). Discussions were launched with the proposal by Theo Waigel, the German finance minister, in November 1995, that a 'Stability Pact for Europe' should be concluded<sup>10</sup>. This would tighten the rules on budgetary behaviour for the EMU participants and should include potential sanctions.

After long and extended negotiations, a political agreement was reached at the Dublin Summit in December 1996. The SGP introduced two complementary pieces of secondary EU legislation: a 'preventive arm', which aimed at ensuring prudent fiscal policies with, as an objective, a government budget close to balance or in surplus; and a 'corrective arm', aiming to correct gross policy errors (with the possibility of sanctions).

The first decade of the euro was, with hindsight, relatively quiet. There was however a crisis around the SGP, with the European Commission taking Germany and France to the EU Court of Justice. It led to the first reform of the SGP in 2005, making the rules more flexible and giving the Council a greater degree of discretion.

The euro's second decade was much more tumultuous, with the Great Financial Crisis (starting in 2007 with problems in the US subprime mortgage market) and the euro area debt crisis. These went together with vivid economic debates (see Brunnermeier *et al* 2016, and Buti, 2021).

To counteract the deflationary consequences of the Great Financial Crisis, policymakers adopted expansionary budgetary and monetary policies, which marked a return to Keynesian economics. The sovereign debt crisis became a watershed in the process of European integration. The crisis showed the limits of Europe's incomplete EMU, with a well-elaborated monetary pillar, but a weak economic pillar.

European economic policymakers responded with a range of measures, not just emergency assistance, fiscal consolidation programmes and non-conventional monetary policy, but also substantial reforms to European economic governance, taking steps towards a more 'symmetric' EMU, as advocated in the *Werner Report*.

In the first instance, especially given the major budgetary derailments in Greece, the focus was on a strengthening of fiscal sustainability. Three legislative packages were particularly important: the 'six pack', 'two pack' and the new 'fiscal compact'.

A primary aim was to tighten fiscal discipline by reinforcing the SGP, both the preventive and corrective arms. A further objective was to increase national ownership and transparency in the area of budgetary policy, especially with the creation of independent national fiscal councils.

Moreover, major competitiveness imbalances and asset boom-bust cycles were major factors behind the crisis. This was clearly shown in Ireland and Spain, where the lower interest rates that came with EMU led to a booming economy, especially in the real-estate sector.

This also led to significant wage increases, which hampered the competitiveness of these economies. When interest rates rose, the boom in the real-estate sector collapsed, leading to banking crises in these countries. This showed that asymmetric shocks could not only originate in the public sector (the focus in the Delors Committee), but also in the private sector.

Consequently, a new Macroeconomic Imbalances Procedure was set up. The aim was to create a system of ex-ante surveillance of macroeconomic risks and competitiveness positions. The European Union also set up new financial stabilisation mechanisms to provide for financial solidarity, especially the European Stability Mechanism.

Significant steps were also taken to establish a banking union. Setting up the Single Supervisory Mechanism (SSM) was a significant step in the European integration process, probably the most important since the introduction of the euro (Véron, 2015).

That the SSM was entrusted to the European Central Bank was a sign of confidence in the ECB and its institutional set-up. But the completion of the banking union remains to be done.

The COVID-19 pandemic, which swept through Europe in 2020, also had significant economic consequences. The European Central Bank set up a Pandemic Emergency Programme, a major asset buying programme, aimed at preserving access to affordable funding for persons and firms. But there was also a strong consensus that a Keynesian type of budgetary impulse was necessary to avoid a depression. The SGP was suspended in 2020.

Moreover, new funding initiatives at the EU level were launched, especially SURE (Support to mitigate Unemployment Risks in an Emergency) and the post-pandemic recovery plan, NextGenerationEU (with, at its centre, the Recovery and Resilience Facility, a vehicle for EU borrowing and the provision to member states of grants and loans).

The aim was not only to boost aggregate demand but also to support the most hard-hit countries (a form of ex-post insurance for countries that were impacted most by the pandemic) and to strengthen the economic growth potential of the EU (with a focus on the green and digital transitions).

However, the ‘whatever it takes’ fiscal policy contributed to significant government deficits and increases in government debt in several countries, raising the issue of fiscal dominance. In summer 2021, inflation started to rise again.

It led to a debate among policymakers and academics about whether this rise would be temporary or not. The inflation turned out to be higher and more persistent than the forecasts of about all institutions.

With the end of COVID-19 as a pandemic, the issue of a normalisation of policies also came to the forefront. The shortcomings of the SGP led to significant debates (see, eg. Arnold *et al* 2022), and the European Commission launched proposals for a new reform of the Pact.

Also, the former president of the European Central Bank, Mario Draghi (2023), raised the issue of fiscal union. A well-designed ‘central fiscal capacity’ would relieve pressure on national fiscal policies, making it easier for national fiscal policies to follow a rules-based path.

It could further provide for the provision of European public goods (for instance related to a common defence policy). Such reforms would bring Europe’s EMU closer to the type of EMU that was advocated in the *Werner Report*, with both a strong monetary and economic pillar.

## 10 Conclusion

During the second half of the twentieth century, there was a major shift in economic paradigms, both in the academic community and among policymakers. While in the 1960s Keynesian economics dominated, with a belief in discretionary economic policy, in the second half of the 1980s, there was a broad consensus on medium-term stability-oriented policies.

This shift towards a more stability-oriented stance of economic policy was clearly reflected in the EMU debates in Europe. In both the *Delors Report* and the Maastricht Treaty, price stability was emphasised as the overriding goal of monetary policy, which had to be carried out by an independent central bank.

These ideas were not really mentioned in the *Werner Report* when monetary policy was discussed. The *Werner Report* also proposed the creation of a supranational centre of decision-making for economic policy, which would exercise “*a decisive influence over the general economic policy of the Community*” (*Werner Report*, 12), while the *Delors Report* emphasised binding rules for budgetary policy.

The emphasis on budgetary discipline went together with proposals for a limited budget for the European Community. In a 1993 report for the European Commission, an EU budget of 2 percent of Community GDP was considered capable of sustaining economic and monetary union (CEC, 1993, 6).

This contrasted with the earlier *MacDougall Report*, which considered that an EU budget of 5 percent to 7 percent of GDP was necessary for a monetary union (CEC, 1977, 20). The lower figure reflected a different economic paradigm, with a more limited role for the government in economic life. A smaller Community budget was also a more realistic option, given the attachment of national states to their sovereignty.

Of crucial importance for the development of the European Union was the way that a further push towards integration fitted into this new (neo-liberal) conceptual framework. The completion of the internal market, with its elimination of the remaining barriers to a free flow of goods, services, persons and capital, was compatible with the deregulation strategy being pursued in the various European countries.

Macroeconomic policy in the countries of the European Community became more stability oriented, as policymakers became convinced of the illusory nature of the trade-off between inflation and unemployment. This orientation fitted in with a policy of stable exchange rates and a move towards EMU.

But it would become an EMU with a strong monetary pillar and a weak economic pillar. This proved to be a weakness when the euro area was confronted with severe challenges in the twenty-first century.

On 1 January 1999, EMU effectively started with eleven countries. One might ask why this attempt at EMU was successful, in contrast to the fate of the Werner plan in the 1970s. Two types of factors can be distinguished: first, long-term structural developments which created a favourable background (a greater degree of economic and financial integration, a greater consensus on policy objectives and an increasing underlying political will to achieve European integration, as exemplified in the Kohl-Mitterrand tandem) and, second, the dynamics of the process of European integration in the 1980s and 1990s.

This was the period when history accelerated, with the fall of the Iron Curtain and German unification, creating a window of opportunity, which has been skilfully exploited with the help of appropriate policy decisions and meticulous preparations. However, on numerous occasions the project could have derailed, especially during the 1992-1993 crisis of the European Monetary System. It could therefore be argued that the achievement of EMU should not be taken for granted.

The transfer of sovereignty over monetary policy to the European level was certainly not an easy decision from a German perspective. German economic policymakers, and the Bundesbank, were comfortable with how the European Monetary System functioned.

This transfer of monetary sovereignty was part of a political project. For Kohl it was a step towards a United States of Europe, a recurring theme in his speeches. He knew that France would only accept this if monetary union was part of it. But the transfer of monetary sovereignty was the limit of what could be accepted.

Giving up monetary sovereignty was also easier as countries had de facto lost their monetary autonomy in the EMS and it were the central-bank governors who would lose power, not the politicians.

However, countries did not accept further significant transfers of economic policymaking. It made for an EMU with a strong monetary pillar, but a weak economic pillar, a stark contrast with the vision of the *Werner Report*.

We have paid considerable attention to a background study for the *Delors Report*, *The Werner Report Revisited*. This study highlighted four ‘intrinsic weaknesses’ of the *Werner Report*: absence of internal momentum, inappropriate policy conception, institutional ambiguities and insufficient constraints on national policies. An interesting question is how these issues have played out in the Maastricht Treaty framework.

With the realisation of EMU, it is clear that policymakers succeeded in creating internal momentum, with a positive dynamic between policy initiatives and the working of market forces. Maybe there was also some luck involved<sup>11</sup>, but there was certainly also a strong political will and leadership. However, the momentum to go towards a ‘complete’ EMU is clearly lacking.

As regards an inappropriate policy conception, one can only observe that, during the last few decades, the world has gone through several paradigm changes. With the Great Financial Crisis and the COVID-19 pandemic, there has been a return to Keynesian economics and discretionary budgetary policies, followed by a return of inflation. It shows a certain relativity of economic theory.

It is then important for policymakers to take an instrumental approach to economic theory and to identify the most appropriate economic theories, given the policy challenges. A broad and pluralist approach towards economics can help in this. It is important to select theories that highlight the relevant features of reality.

The great Austrian economist, Joseph Schumpeter (1954: 15), approvingly referred to Henri Poincaré's observation, "*tailors can cut suits as they please; but of course, they try to cut them to fit their customers.*"

An historical perspective can offer insights into the relative strengths and weaknesses of economic theories. Moreover, for policymakers, the policy regime is of crucial importance. Sometimes, one tends to take the policy regime as given, rather ignoring that a change in regime will affect economic events and policy outcomes.

At other moments, on the contrary, there are heated discussions about the policy framework. A broad historical approach, which can offer distance and a wider variety of experiences, can be helpful. Regarding institutional ambiguities, the picture is mixed.

For the monetary side of EMU, a strong institutional pole has been created with the European Central Bank and the Eurosystem. A testament to this is that the tasks of the ECB have been extended, with important responsibilities for banking supervision.

However, EMU has remained incomplete, with economic policy competences still mostly at national level. Given the absence of a significant central fiscal capacity at the EU level, rules for budgetary policy have to take into account the different roles that national budgetary policies have to play (not only sustainability but also stabilisation of the national economy).

As more discretionary fiscal policies had to be adopted during the twenty-first century crises, the absence of a strong economic pillar of EMU, as advocated in the *Werner Report*, turned out to be a serious shortcoming of Europe's EMU.

*The Werner Report Revisited* highlighted very much the "insufficient constraints on national policies" in the *Werner Report*. However, regarding the Maastricht Treaty framework and the Stability and Growth Pact, the situation is not much better.

One could argue that the phrase, "*the Werner approach is essentially 'coordination and recommendation' rather than 'institution and decision'*" also applies to the economic pillar of the Maastricht Treaty framework. Why this weakness has not (yet) been corrected raises some fundamental political-economy questions about the conception and implementation of a sound economic governance framework.

These are not only issues of concern for national sovereignty but are also related to the multidimensional aims of fiscal policy (with the Musgravian triad of allocation, stabilisation and redistribution) and the need to keep the public finances sustainable. ■

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## Endnotes

1. This contrasted with German analyses of the Bretton Woods system, which focused on the threat that intervention obligations in the foreign exchange markets posed for price stability (Emminger, 1977, 53).
2. Given the reluctance of German economic policymakers (the Bundesbank and the economy and finance ministries did not want to prepare a proposal on the lines Brandt wished), Brandt turned to Jean Monnet, who asked Robert Triffin to elaborate a memorandum for Brandt (Maes with Pasotti, 2021).
3. While the free movement of capital was an indispensable element of a monetary union, the Werner Report also underlined that it was an essential element of a common market (with the four freedoms: free movement of goods, services, labour and capital).
4. The report further argued that only the balance of payments with the external world would be of relevance for the monetary union, “Equilibrium within the Community would be realized at this stage in the same way as within a nation’s frontiers, thanks to the mobility of the factors of production and financial transfers by the public and private sectors” (Werner Report, 10). It is a somewhat strange statement. It reflects very much optimum currency area theory (like the Mundell criterion on factor mobility as well as the importance of transfers). The euro area’s debt crisis showed the importance of the balance of payments also inside an (imperfect) monetary union.
5. The Werner Report did not mention the notion of central-bank independence. Discussing the relations between the different institutions, it mentioned “safeguarding the responsibilities proper to each” (Werner Report, 13). According to Tietmeyer (interview, 18 December 2001), this implied the independence of the central bank.
6. It shows Delors’s interest in the EMU dossier from the moment he became president of the Commission. He would attend the meetings of the Committee of Central Bank Governors (Maes, 2006). It is also noteworthy that Delors started his career at the Banque de France.
7. In a later report, the European Commission (CEC, 1990) emphasised three aspects of (national) budgetary policies in EMU: autonomy (to respond to country-specific problems), discipline (to avoid excessive deficits) and coordination (to assure an appropriate policy-mix in the Community).

8. Important elements in this coordination process were the Broad Economic Policy Guidelines, the multilateral surveillance process and the excessive deficit procedure (with two reference values: 3 percent of GDP government deficit and 60 percent of GDP for government debt). There was also the no-bail-out clause – that countries remained solely responsible for their debts.

9. Senior German policymakers admitted that there was a kind of contradiction in the German negotiation position, with Germany being against a 'gouvernement économique' but in favour of restraints on national budgetary policies. Waigel's political problems in Bavaria were mentioned as an explanatory factor.

10. For German economic policymakers, the Italian debt situation was one of their main preoccupations in the EMU negotiations. The Waigel initiative came around the same time that Italian policymakers showed their interest in being among the first group of countries to adopt the euro. Was it a quid pro quo?

11. It is said that Napoleon asked of his generals that they were lucky.

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# The first 25 years of the euro: a bird's-eye view

At 25 the euro area has shown extraordinary resilience.  
Marco Buti and Giancarlo Corsetti articulate a set of  
reforms to complete the euro area architecture

The 25<sup>th</sup> anniversary of the euro is a good time to take stock of “*the greatest monetary experiment of the modern era.*” At its inception, economists’ views were polarised. Many, especially in the Anglo-Saxon world, expressed doubts, even going so far as to argue that the single currency would lead to a war between member states (Feldstein 1997).

At the other extreme, the official narrative at times envisaged a rosy future of macroeconomic stability, ensured by a fiercely independent central bank and a stability-oriented fiscal framework. It counted also on the desirable structural reforms eventually adopted by member states.

In reality, none of the extreme scenarios (war versus Nirvana) materialised. Rather, the euro has shown extraordinary resilience through several critical moments, proving prophecies of doom wrong. While it delivered on some of its promises – primarily, price stability over most of the period, in line with other regions in the world – it has disappointed those who held expectations of an increase in economic integration and potential growth, combined with a leap forward towards political union in Europe.

In large part, the mixed record of the euro area is due to the fact that its architecture was incomplete at birth and, in spite of substantial progress, remains incomplete today, with the fiscal and economic arms vastly underdeveloped compared to the monetary one.

At the outset, the case for a balanced architecture was dismissed with the argument that trying to address all issues before the launch of the single currency would risk derailing the project altogether. Today, the case is much stronger.

## The euro's four phases

To see what an incomplete architecture has meant for the euro area, in a new *CEPR Policy Insight* (Buti and Corsetti 2024) we review the past 25 years distinguishing four phases: the first decade of (over-)optimism and resource misallocation (1999 to 2008); the decade of home-bred crises and fragmentation (2008 to 2019); the progressive response to the pandemic (2020 to 2021); and the return of policy trade-offs in the battle against inflation (from 2022 to the present day). The main economic indicators and the institutional developments characterising these four phases are summarised in Tables 1 and 2.

*It should now be crystal clear that leaving the euro area architecture incomplete, hoping for a ‘political leap forward’ in the next crisis, is both very costly and very risky*

**Table 1. Main macroeconomic indicators**

	GDP	Inflation	Current account	Government balance
1999-2008	2.25% (0.5/3.8)	2.2% (1.2/3.3)	0.1% (-0.7/1.0)	-2.1% (-3.1/-0.7)
2009-2019	0.8% (-4.6/2.6)	1.3% (0.2/2.7)	2.4% (0.5/3.6)	-2.9% (-6.3/-0.4)
2020-2021	-0.1% (-6.3/6.0)	1.4% (0.3/2.6)	3.0% (2.3/3.6)	-6.2% (-7.1/-5.2)
2022-2023	2.0% (0.7/3.4)	7.0% (5.6/8.4)	1.8% (1.0/2.5)	-3.4% (-3.6/-3.2)

Note: Columns refer to the year-on-year growth of real Gross Domestic Product, yearly HICP, current account balance (as % of Euro Area GDP) and government balance (as % of Euro Area GDP). Numbers in parenthesis refer to the minimum and maximum registered value for the period.

Source: European Commission.

The first phase is the '2% decade': growth, inflation, and budget deficits are on average close to 2%. It was the period of 'Great Moderation' and excess optimism, associated with a systematic underestimation of macro and micro risks, in the European economy as in the world economy.

It was in these years that, in a context of perceived stability, the imbalances that will haunt the euro area in the years to come accumulated. The bonus of interest rate convergence across member states, with minimal spreads,

**Table 2. EU and euro area institutional reforms**

	1999-2008	2009-2019	2020-2021	2022-2023
Supranational	SGP reform	Six and Two Pack BU: Single Supervisory Mechanism (SSM) European Financial Stabilisation Mechanism (EFSM)	Triggering of the SGP General Escape Clause State Aid Temporary Framework Support to mitigate Unemployment Risks in an Emergency (SURE)	Economic governance reform (ongoing) Temporary State Aid Framework + NGEU RePower EU
Intergovernmental		ESM (successor of the temporary European Financial Stability Facility, EFSF) Fiscal compact	ESM Pandemic Facility ESM Treaty reform (backstop Single Resolution Mechanism, SRM)	ESM Treaty ratification (ongoing)
Euro area accession (11 members in 1999)	EL (2001) SI (2007) CY, MT (2008)	SK (2009) EE (2011) LV (2014) LT (2015)		HR (2023)

Source: Authors' elaboration based on European Commission sources.

embellished public accounts and led to a reduction in overall deficits in vulnerable countries; accommodating fiscal and monetary conditions favoured growth, reducing the pressure to adopt structural reforms and removing the urgency to strengthen the banking system.

Nominal convergence, however, concealed structural divergence: capital within the euro area flew in the right direction, from the richest towards the less wealthy countries, but ended up in the wrong sectors (real estate and non-tradable services) through the wrong instrument (short-term bank loans).

While the current account was in balance for the euro area as a whole, large imbalances opened inside the area, reflecting the increasing specialisation of the ‘periphery’ in non-tradeables and dependency of its banking system on the core countries’ banks, in turn heavily exposed overseas. These structural divergences translated also into a divarication of social preferences between euro area members.

The Great Financial Crisis brought these imbalances to light. Relative to the magnitude of financial problems in the European banking system, the Greek fiscal crisis that ignited the crisis was actually a relatively contained issue.

But because the crisis originated from it, with discovery that the official Greek accounts were far from the truth, trust among member countries quickly evaporated, preventing a prompt and effective response to the crisis in all its fiscal and financial dimensions.

The political narrative became one of fiscal laxity and moral hazard, implicitly seeing the costs of the crisis as necessary to discipline profligate governments. The overarching principle was ‘putting your own house in order’.

Therefore, the EU intervened only as ‘ultima ratio’, after all means at national level had been exhausted. In this context, a euro area-level response, with the creation of the European Stability Mechanism, the launch of the Banking Union project, the introduction of the Outright Monetary Transactions, and the scaling up of the ECB balance sheet programmes, came substantially late.

The focus on fiscal policy delayed the measures needed to put the banking system on a sounder footing. It was only after Mario Draghi’s “*whatever it takes*” speech in July 2012 that the risks of a euro area breakup receded and the area could return to a path of growth, but with large disparities between countries. With monetary policy long being the ‘only game in town’ (much more in the euro area than in other regions), the economic and financial space of the euro area remained fragmented, and the macro stance insufficiently weak.

Reflecting the strong fiscal correction and recession in the crisis countries, the external balance of the euro area moved into a persistent surplus of 2% of GDP or more. Remarkably, in spite of the perceived sense of existential crisis, the euro area continued to expand – an indication of the huge amount of political capital invested in the euro that markets tended to belittle.

Remarkably, the response to the pandemic crisis of early 2020 was totally different. The lessons from the mismanagement of the sovereign debt crisis were at least in part learned, but more importantly, the ambitious policy response benefitted from a ‘benign coincidence’ of circumstances: the exogenous nature of the crisis and the absence of electoral appointments on the horizon allowed EU leaders to act with fewer internal constraints and embrace a narrative of solidarity free of moral hazard concerns.

The result was the suspension of the Stability and Growth Pact, the SURE programme to support the labour markets, NextGenerationEU to foster the double transition, both with common borrowing, and the ECB’s Pandemic

Emergency Purchase Programme. Policies moved in the same direction, ensuring a congruent mix across policies (fiscal and monetary) and space (EU and member countries). Evidence of strong collective leadership reassured markets, the risks of fragmentation receded, and the economy rebounded strongly.

This virtuous scenario, however, did not last. The surge in inflation, ignited worldwide by strong macroeconomic stimulus and the imbalances due to the disruption of value chains during the lockdown, was exacerbated in Europe by the energy crisis following Russia's war of aggression.

Europeans manage to coordinate policies to reduce the region dependence on Russian gas but failed to deliver a common and forward-looking response in the spirit of NextGenerationEU. Monetary and fiscal policy moved in opposite directions.

With rising debt and deficits, the strongest monetary tightening since the 1980s marked the return of policy trade-offs. This new phase – still ongoing – did not remove the deadlocks in the debate on EMU reforms. The huge political capital spent to maintain unity on the sanctions against Russia and the overriding domestic political concerns probably hindered other common endeavours.

### **Back to the future: from the 'inconsistent quartet' to the 'euro trilemma'**

Based on the assessment above, how should the reform of EMU's architecture be approached? In light of the experience of the first 25 years in the life of the euro, it seems appropriate to go back to the initial inspiration for the project of a single currency as a keystone of the Single Market project.

Indeed, Tommaso Padoa-Schioppa proposed the 'inconsistent quartet', a European version of the open economy 'trilemma', adding free trade (essentially, the Single Market) among EU members as the fourth corner: a single

currency would prevent the competitive devaluations that were incompatible with preserving a level playing field and that created political acrimony in the 1980s (Padoa-Schioppa 1987).

The quartet clarifies that a deficit in macroeconomic stabilisation at EA/EU level would create strong political and economic incentives for national governments to respond to shocks (domestic and external) resorting to national industrial policy, tax and regulatory initiatives and stealth subsidies, *de jure* or *de facto* incompatible with the Single Market.

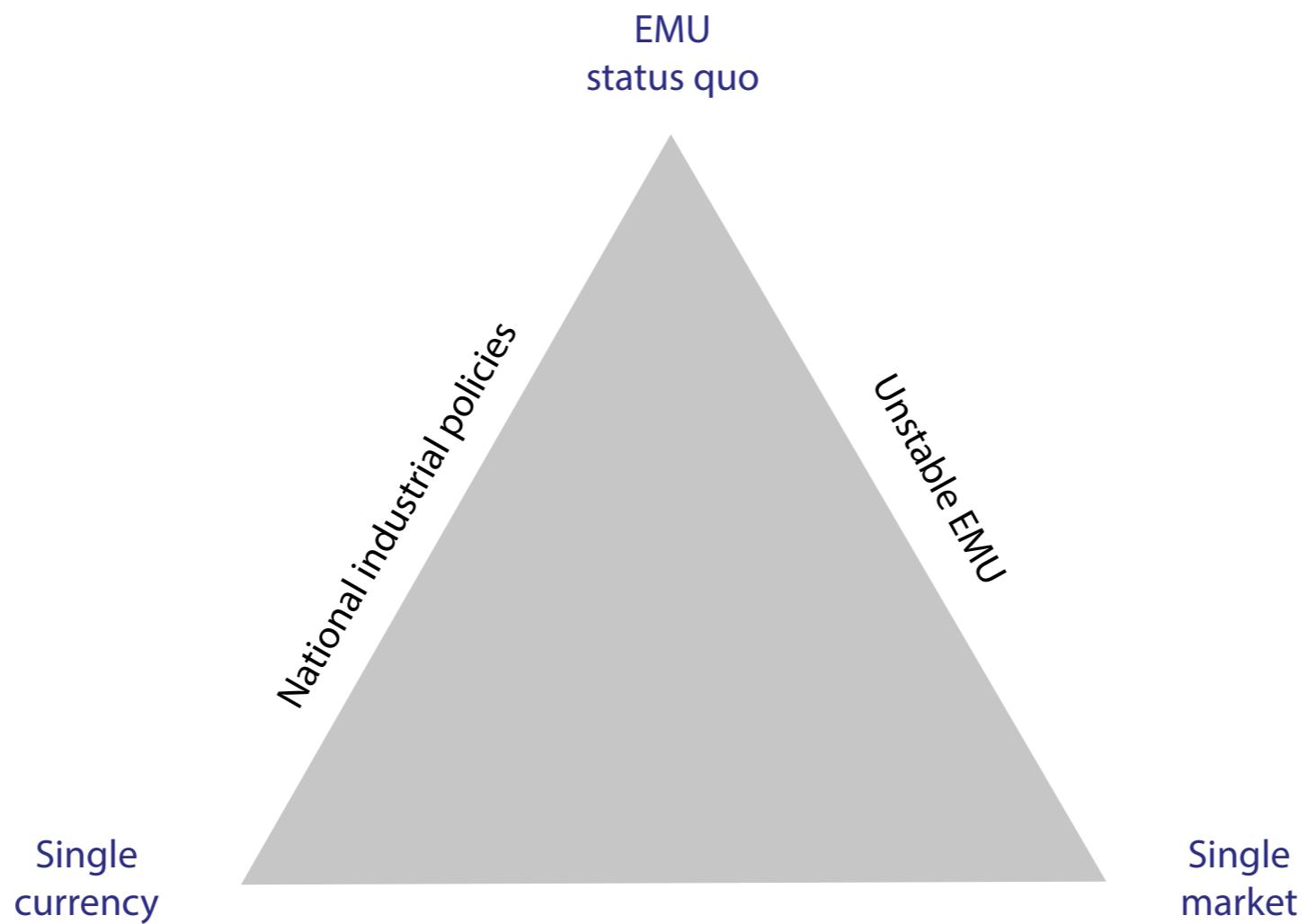
The experience during the energy crisis and the response to the American Inflation Reduction Act (IRA) is telling. A resilient euro area, with enough stabilisation tools in place, is essential to prevent member states from going down a route that would lead to 'real' fragmentation, up to creating risks for the integrity, let alone the performance, of the Single Market.

These considerations can be synthesised via a modern reformulation of the inconsistent quartet, in terms of a euro trilemma (see Figure 1). Currently, the incomplete-union status quo (the upper corner of the triangle) is not simultaneously compatible with the Single Market (right lower corner) and a stable single currency (left corner).

The need to maintain macro and financial stability conditional on the current architecture (along the left side of the triangle) creates strong incentives to resort to inward-looking national industrial policies and other measures undermining the foundations of the Single Market.

Enforcing the Single Market rules without an adequate EMU architecture empowered with tools and competences to complement the Single Market (the right-hand side of the triangle) creates permanent risks of macro and financial instability, which we synthesise with the idea of an 'unstable EMU'.

**Figure 1. The euro area trilemma**



*Source: Authors' elaboration*

The single market in an area of macro and financial stability (the bottom side of the triangle) is the constitutional goal of the reform of the euro area architecture.

### **The policy agenda looking forward: back to Delors' inspiration**

In the light of the history of the first 25 years, how should we approach the reform of the euro area's economic constitution to overcome the current status quo?

We stress two main points. First, it should now be crystal clear that leaving the euro area architecture incomplete, hoping for a 'political leap forward' in the next crisis, is both very costly and very risky. The response to the pandemic was possible because of favourable circumstances, but there is no guarantee that in the next crisis the EU will find comparable cohesion and deliver an effective common response (the suboptimal agreement on the reform of fiscal rules is there to demonstrate this).

We do not need to wait for another crisis to complete the Banking Union with a credible resolution fund (here, the failure to ratify the new treaty of the European Stability Mechanism by Italy is serious) and a common deposit insurance. These are key reforms to enhance the stability, integration, and development of the European financial system overnight.

The opposition of risk sharing to risk reduction can be overcome (reconciling the two strategies) if one considers the major benefits (economic and geopolitical) from integrated and stable financial markets – which in turn reinforces the case for removing the stalemate on the Capital Markets Union, given the challenge of financing the digital and green transitions.

Second, and most crucially, completing the euro area architecture is necessary to safeguard – and further develop – the most precious asset of European economic integration: the Single Market. Coupling the Single Market with a single currency, within an overall project addressing Europe's growth bottlenecks and equity concerns, was the most prescient intuition and the enduring legacy of Jacques Delors as President of the European Commission in the 1980s and early 1990s.

In the past 25 years, the contribution of 'one money' to 'one market' has not been stellar. In the first decade, in the context of a half-baked architecture, the euro favoured the misallocation of resources and undesirable specialisation patterns; in the second decade, the deficiencies of the macro and financial governance in the area magnified instability and created fragmentation of the economic and political space.

Thanks to a series of fortuitous circumstances, it did not prevent effective coordination in the response to the COVID-19 pandemic, minimising the risk of an economic meltdown, but this response has not raised the appetite for institutional development.

As of today, Europe appears to be facing the risk of an inefficient multiplication of national industrial policies financed via state aid, undermining the very core of the Single Market project. This state of affairs has to be overcome.

The most straightforward and economically sensible way is to step up transnational investment in European public goods in the double green and digital transition, in human capital and in the availability of critical materials – as the core of an industrial policy at European level that can truly relaunch the competitiveness of the EU economy.

This will require, again, crossing difficult political red lines. Kohl, Mitterand and Delors were able to do so after the fall of the Berlin Wall, and Macron, Merkel, and von der Leyen during the pandemic. Due to different circumstances, they all had a low 'political discount rate'. A similar display of leadership will be required to make the euro future-proof. ■

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# Beyond money: the euro's role in Europe's strategic future

To ensure the euro's role in Europe's future Fabio Panetta argues that we need effective macroeconomic stability, a fully-fledged banking and capital market union, and a dynamic payments and market infrastructure



The euro itself was launched 25 years ago, in January 1999, and at the end of that year Latvia, Lithuania, Romania, Slovakia, Bulgaria and Malta were invited to start negotiations to join the European Union (EU)<sup>1</sup>. These events are all part of a single, coherent historical process, driven by the integration project that Europe undertook in the post-war period.

The Economic and Monetary Union (EMU) is one of the most ambitious elements of this project, and the euro is both a key achievement and a powerful symbol of success. Given my role and background, you might expect me to talk about the euro from a purely monetary perspective.

However, I will not do that. Finance is a means to serve society, and the euro is no exception: the single currency has objectives and implications that go far beyond the monetary sphere. Its fate shapes Europe's role in the global economic and financial landscape.

Its function as an international reserve currency affects Europe's strategic autonomy and geopolitical position. From the perspective of 2024, the relevance of these issues can hardly be overstated. My remarks are structured around three broad themes.

First, why we care about the international role of the euro (IRE), second, how this role has evolved over time, and third, what we can do to strengthen it.

## **1. Why do we care about the international role of the euro?**

Before February 2022, most people would have answered this question in purely economic terms. Issuing a currency that is widely used internationally for commercial and financial transactions brings both benefits and risks to an economy.

It is crucial for a central bank to consider these factors in order to achieve its price stability objective and preserve financial stability. Let me summarize them. Before the global financial crisis, the benefits were traditionally considered to be threefold.

First, high seigniorage for the central bank, and ultimately for the taxpayers of the issuing country<sup>2</sup>. Second, a reduction in transaction and hedging costs for users of the currency. Third, the ‘exorbitant privilege’<sup>3</sup>: as long as there is strong global demand for safe assets, an economy issuing a reserve currency enjoys lower funding costs than its peers and hence it earns a positive return on its net foreign asset position<sup>4</sup>.

*A scarce supply of safe euro-denominated assets is perhaps the single most important constraint on the CMU, and hence on the global reach of the euro*

The main risks were associated with higher volatility in monetary aggregates and capital flows due to exogenous shifts in demand and risk appetite. The global financial crisis prompted a re-examination of these issues.

On the one hand, we realized that the ‘exorbitant privilege’ could become an ‘exorbitant duty’ at times of international stress, when the dominant economy unwillingly becomes a global bank and experiences a sharp exchange rate appreciation<sup>5</sup>.

On the other hand, we learned that an international reserve currency reduces the pass-through of exchange rate shocks to domestic inflation, making foreign exchange volatility less of a concern, and that, in a financially integrated world, it can make monetary policy more powerful by generating positive spillovers and spillbacks<sup>6</sup>.

All in all, the macroeconomic benefits of issuing a reserve currency should largely outweigh the risks<sup>7</sup>. The estimates obtained from US data are instructive in this respect. Research shows that the US Treasury historically issued long-term bonds at a discount of 30 to 70 basis points relative to private securities with comparable characteristics, generating seigniorage revenues of the same magnitude as those obtained by the Federal Reserve from the monetary base.

For the euro area, assuming a hypothetical 50 basis points discount, seigniorage could in principle generate a revenue of  $\frac{1}{2}$  percentage point of GDP per year<sup>8</sup>. These numbers are purely indicative, but they may give us an idea of the magnitude of the potential gains<sup>9</sup>.

More importantly, Russia’s aggression against Ukraine was a stark reminder that these monetary benefits only tell (at best) half the story: the other half has more to do with politics than monetary economics. In a politically volatile world, a country that issues an international currency is less exposed to financial pressures from other (possibly hostile) nations.

The reason for this is that its financial and payment flows do not require the use of other currencies. In and of itself, an international currency is a pillar of the issuer's 'strategic autonomy'. It acts as an insurance policy – a function that may seem worthless in normal times but becomes very valuable in bad times.

Europeans are fully appreciating its value today. The issuer of a global currency can use its financial power to influence international developments. This power must be used wisely, however, because international relations are part of a 'repeated game': weaponizing a currency inevitably reduces its attractiveness and encourages the emergence of alternatives.

The case of the renminbi is instructive in this respect. The Chinese authorities are explicitly promoting its role on the global stage and encouraging its use in other countries, including those sanctioned by the international community following the invasion of Ukraine.

Most of Russia's imports from China, as well as some of its oil shipments to China, are now invoiced in renminbi<sup>10</sup>, and the share of Chinese trade settled in renminbi has doubled over the past three years<sup>11</sup>. As a result, at the end of 2023, the renminbi overtook the euro as the second most used currency for trade finance<sup>12</sup> and the yen as the fourth most used currency for global payments<sup>13</sup>.

There is little evidence so far that political fragmentation is *systematically* translating into currency fragmentation<sup>14</sup>, but we should be alert to the possibility that politics will have a greater impact on international currencies in the coming years. And, of course, vice versa.

## **2. The performance of the euro since its launch**

How has the euro performed over its 25-year journey? Between 1999 and 2022, the euro's share in global portfolios fluctuated between 17 and 25 per cent (Figure 1)<sup>15</sup>. The dominance of the US dollar has remained unchallenged. In

terms of foreign exchange reserves, for example, the euro accounts for 20 per cent of the total, while the share of the US dollar is three times as high and has only recently fallen below 60 per cent.

Given the size of the underlying economies, one might think that the euro is ‘punching below its weight’<sup>16</sup>. After all, the US and European economies are about the same size (Figure 2). A closer look at the data sheds light on why the euro failed to gain more ground in global markets.

The share of the euro declined significantly during the financial and sovereign debt crisis, between 2009 and 2015, when the euro area was hit by asymmetric shocks that were met with inadequate policy responses. During this phase, fiscal policies supported the economy for a short time but then turned into procyclical fiscal consolidation. Interventions were uncoordinated and inconsistent with the appropriate fiscal stance at European level.

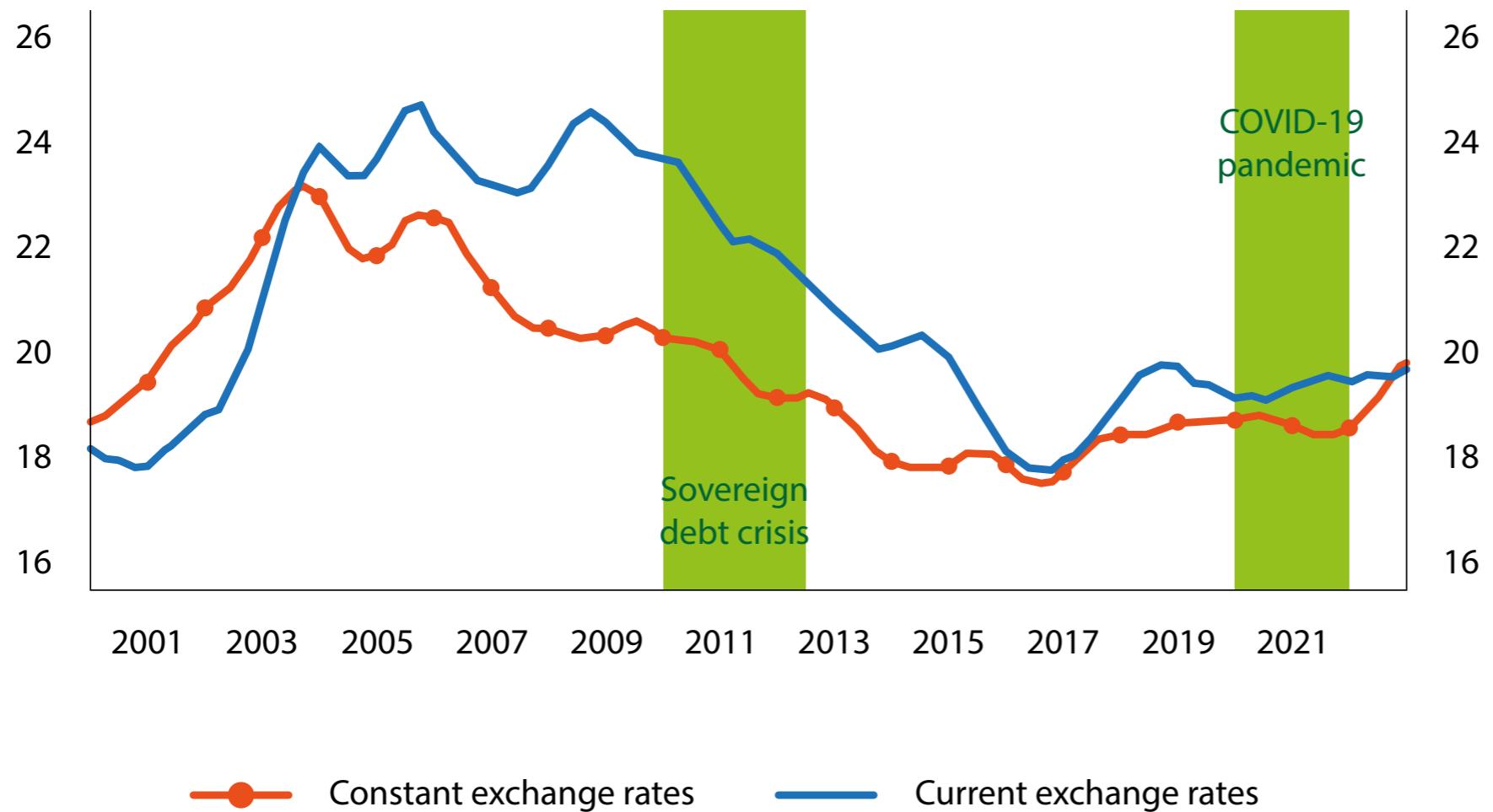
As a result, a fault line emerged between a ‘core’ and a ‘periphery’, leading to deep economic, social and political divisions. Investors believed that the euro area could break up under pressure.

Unsurprisingly, procyclical policies and conflicting messages from policymakers did little to reassure them. It was President Draghi’s ‘whatever it takes’ statement that turned the tide in financial markets, making it clear to everyone that the euro would weather the storm<sup>17</sup>.

Now let’s fast-forward to more recent times. Between 2020 and 2022, Europe was hit by a series of large and persistent supply shocks. The pandemic and the invasion of Ukraine depressed economic activity and caused a rise in uncertainty that was in many ways more significant than that experienced a decade earlier.

**Figure 1. ECB Composite Index of the international role of the euro (1)**

(quarterly data; percentage points)

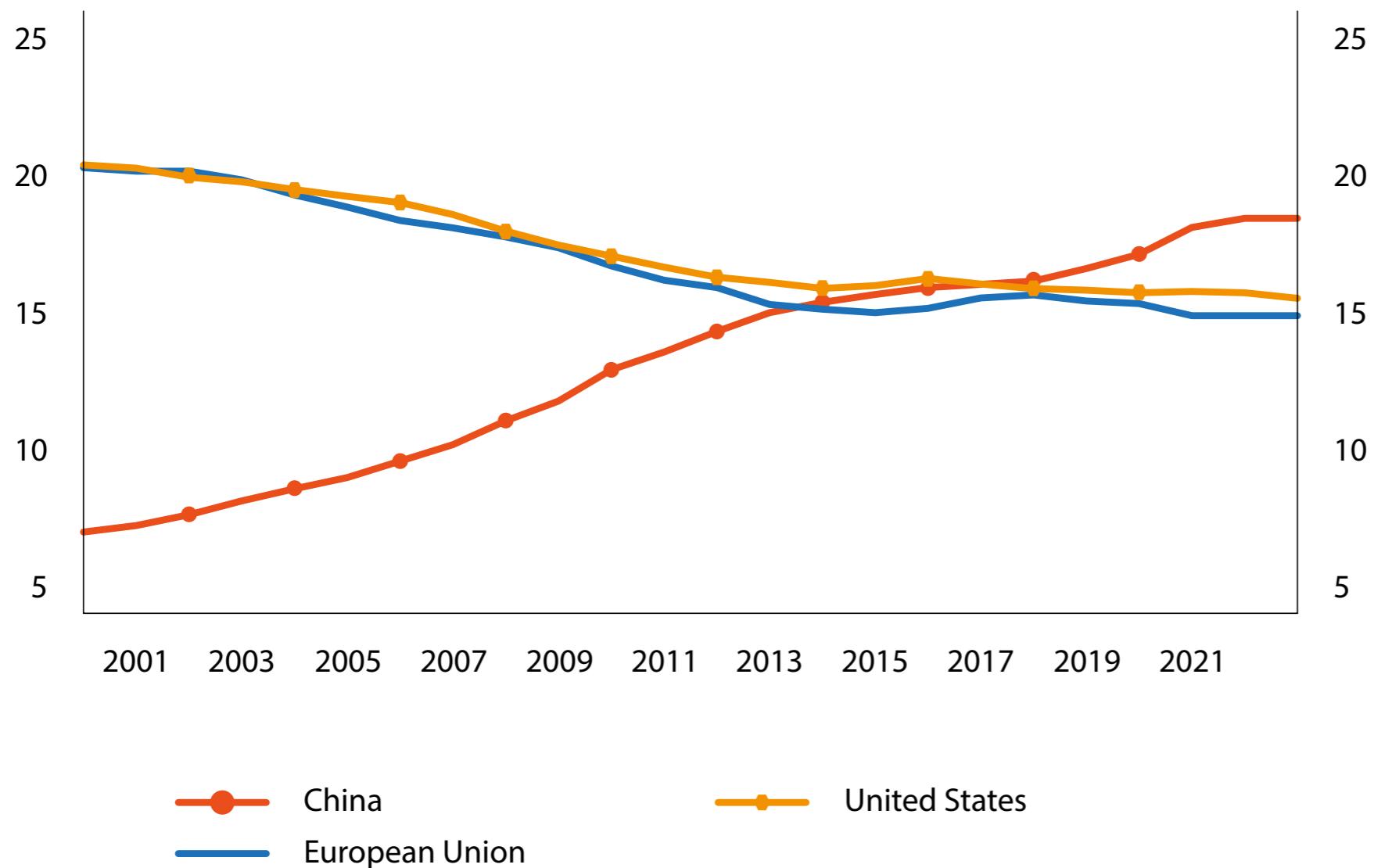


(1) Four-quarter moving average, at current and constant Q4 2022 exchange rates. Arithmetic average of the shares of the euro in stocks of international bonds, loans by banks outside the euro area to borrowers outside the euro area, deposits with banks outside the euro area from creditors outside the euro area, global foreign exchange settlements, global foreign exchange reserves and global exchange rate regimes. See ECB (2023).

Source: ECB.

**Figure 2. GDP based on purchasing power parity (1)**

(annual data; percentage points)



(1) Share of world GDP.

Source: IMF, World Economic Outlook, October 2023.

These shocks also clogged production lines, and dramatically disrupted trade flows. However, this time round they hit an institutional system that was better equipped to deal with them.

Moreover, they were countered by a mix of strong and coherent policy responses at both European and national level. As a result, they had no impact on the IRE: the euro held its ground, and by some measures even strengthened during this period.

It is risky to draw general conclusions from a few observations. However, it seems clear to me that both the nature of the shocks and the policy responses were crucial in these episodes. The euro area is vulnerable to shocks that fragment its economy and financial markets along national lines; the problems are exacerbated when coordination problems hamper or even impede an effective policy response.

Yet Europe can easily withstand large shocks, as long as it sticks together and responds quickly and decisively with appropriate policies. While it may still be true that Europe ‘will be forged in crises’, as Jean Monnet famously declared<sup>18</sup>, it is also true that not all crises are equal and not all responses are the same.

### **3. Enhancing the international role of the euro**

So, how can we promote the IRE? The creation of a global currency is a complex phenomenon that requires many ingredients. Economic size is certainly essential, but not sufficient. Three other factors come to mind.

#### **3.1 The policy mix**

The first and most obvious ingredient is macroeconomic stability. When foreign investors buy euro-denominated assets, they are effectively buying a stake in our economy. The dividend they expect is economic growth and low and stable inflation, and the only way to guarantee this dividend is to implement credible, effective and countercyclical macroeconomic policies.

Even a structurally sound country would struggle to maintain its global role if it lurched from one recession to the next, or experienced frequent bouts of inflation or deflation. This means that getting the ‘policy mix’ right is of paramount importance.

The Great Moderation is now a fading memory, and there is a good chance that Europe will again face situations that require a joint European monetary and fiscal response. The pandemic provides a template for how these situations should be managed; the sovereign debt crisis arguably provides a template for how they should not be managed.

### 3.2 Capital markets

The second key ingredient is a better meeting place for savers and borrowers. To retain domestic investment and attract resources from abroad, Europe needs liquid and integrated capital markets.

This was the idea behind the Capital Markets Union (CMU) initiative launched by the European Commission in 2015, as well as the Commission’s Action Plan of 2020. The CMU could play a key role in diversifying the financing of EU companies, in strengthening private risk sharing and in providing better investment opportunities for domestic and foreign savers.

However, capital markets in Europe are still underdeveloped compared with those in other major advanced economies. Despite efforts to harmonize rules and integrate national markets through the implementation of European legislation, progress towards a single European market has been limited.

Over the past 25 years, financial integration has followed roughly the same path as the IRE (Figure 3). After rising steadily in the early 2000s, it fell to a minimum in the sovereign debt crisis. The positive trend resumed in 2012, following the announcements of the establishment of the Banking Union and the ECB’s Outright Monetary

Transactions and, apart from a temporary dip in 2020, integration maintained its momentum throughout the COVID pandemic.

This is no coincidence: it indicates that the global relevance of the euro goes hand in hand with the degree of financial integration within the EMU. The data also show that, after these ups and downs, European markets are about as integrated today as they were in 2003-2004. I dare say that this result falls short of the European Commission's initial aspirations<sup>19</sup>.

How can we do better? I will not bore you with a detailed review of the CMU, but I would like to mention two issues that I consider critical from the perspective of a 'global euro'. The first problem is the lack of a European safe asset. The availability of a common risk-free benchmark is necessary for critical financial activities.

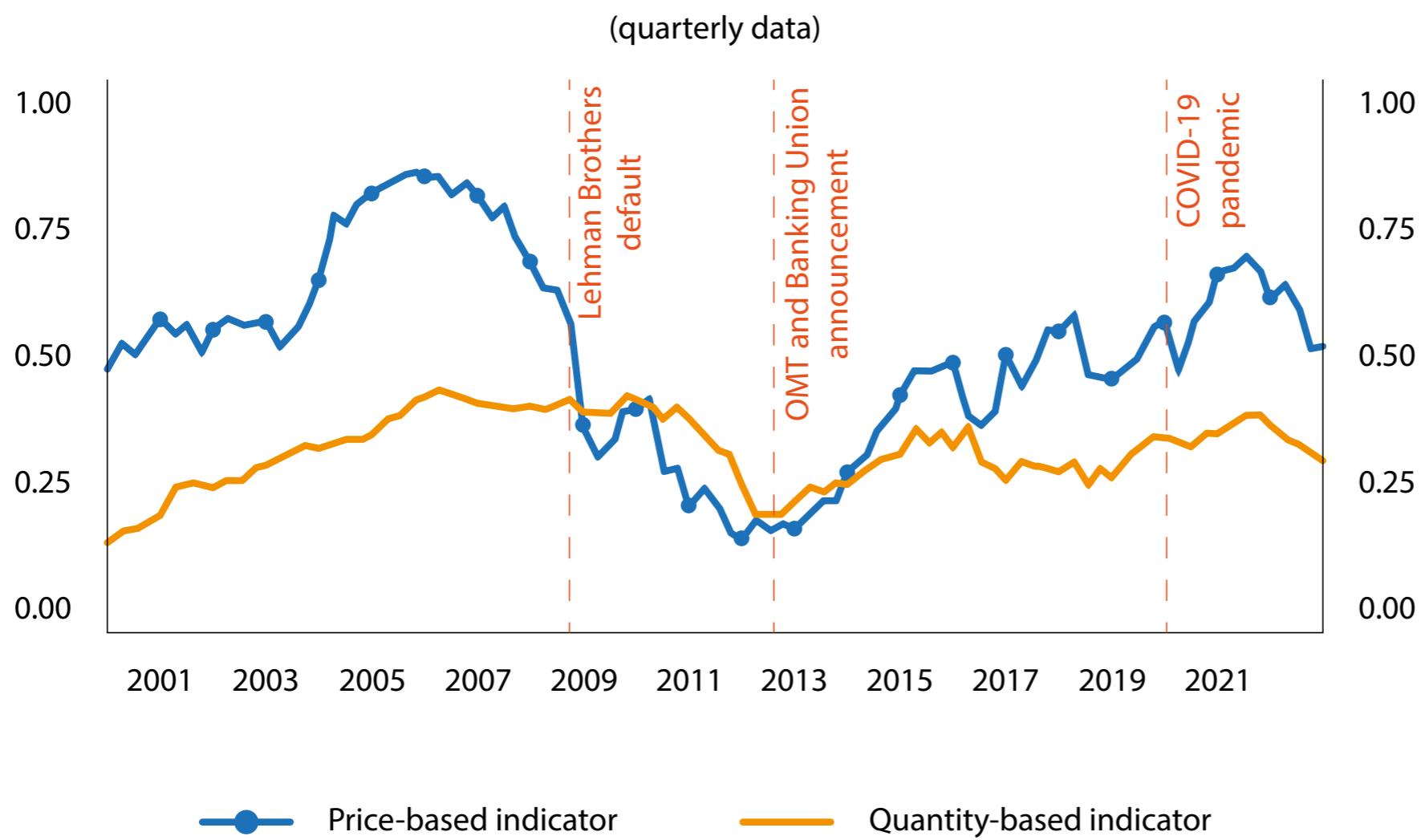
It would facilitate the pricing of risky financial products such as corporate bonds or derivatives, thereby stimulating their development. It would provide a common form of collateral for use in centralized clearing activities and crossborder collateralized trading in interbank markets.

It would help diversify the exposures of both banks and non-banks. It would form the basis of the euro-denominated reserves held by foreign central banks. And the list goes on.

A scarce supply of safe euro-denominated assets is perhaps the single most important constraint on the CMU, and hence on the global reach of the euro<sup>20</sup>.

The issuance of the Next Generation EU bonds is a first and welcome step in this direction, but a one-off programme is not a game changer: to stimulate the development of the CMU and strengthen the IRE, we would need a steady, predictable supply of 'safe assets'.

**Figure 3. Financial integration composite indicators (1)**



(1) The price-based composite indicator aggregates ten indicators for money, bond, equity and retail banking markets; the quantity-based composite indicator aggregates five indicators for the same market segments except retail banking. Both indicators measure integration on a scale from zero (no integration) to one (perfect integration). See *Financial Integration and Structure in the Euro Area*, ECB Committee on Financial Integration, April 2022.

Source: ECB.

The second problem is that we do not have a fully-fledged banking union (yet). The creation of a Single Supervisory Mechanism and a Single Resolution Mechanism after the financial crisis was a quantum leap in this respect, but it was not sufficient to create a single banking market.

The European banking sector remains largely segmented along national lines: in 2021, banks held domestic assets worth more than four times the value of their non-domestic euro-area assets<sup>21</sup>. This poses a problem for the creation of a genuine CMU, as banks play a central role in all the major financial centres.

They operate – and often lead – in key segments such as asset management, bond underwriting and initial public offerings, they provide financial advice and they trade actively in securities markets, often providing critical market-making services. It is therefore difficult to imagine a genuine CMU without banks that are able to operate smoothly throughout the euro area. Improving in these dimensions is as important as ever.

In the coming years, Europe may have to navigate a more challenging global political environment than in the past. It will also have to deliver on its ambitions in areas such as defence and the green and digital transitions. As I have argued elsewhere, a fully functioning CMU would greatly enhance its chances of success<sup>22</sup>.

### 3.3 Payment systems and market infrastructure

The third component is payment and market infrastructures fit for the 21<sup>st</sup> century. These are an essential part of the ‘plumbing’ of the financial system.

Digitalization is clearly the defining challenge of our time: it is a profoundly transformative process that is already having a vast and complex impact on society. Payments are no exception to this trend: demand for digital payment services has grown markedly around the world, especially in the aftermath of the COVID pandemic<sup>23</sup>.

In this landscape, a central bank digital currency (CBDC) can play an important role<sup>24</sup>. The good news is that Europe is in many ways at the forefront of the progress in this area. Many will be familiar with the digital euro, the retail CBDC that is being considered by the Eurosystem.

In addition to making life easier for European citizens, a digital euro would offer great opportunities at international level if it could be made available outside the euro area or used for cross-currency payments<sup>25</sup>.

The same applies to a wholesale CBDC. Unlike the retail version, this is already a reality: the TARGET infrastructure operated by the Eurosystem, which allows banks to settle euro-denominated digital transactions in central bank money via a central ledger, has been operating successfully for decades<sup>26</sup>.

Building on this experience, the Eurosystem is now exploring new solutions based on distributed ledger technology (DLT), and how these could interact with the existing TARGET infrastructure<sup>27</sup>. Digital central bank money is not the only game in town: many other initiatives have been launched to modernize and enhance the EU's infrastructures.

These include, for instance: (i) promoting the linking of TIPS (the euro area's Target Instant Payment Settlement mechanism) with fast payment systems in other countries<sup>28</sup>; (ii) developing the Eurosystem Collateral Management System<sup>29</sup>; (iii) adopting the new EU Regulation on Markets in Crypto Assets (MiCA) to regulate the cryptoasset ecosystem<sup>30</sup>; (iv) adopting the Eurosystem's Cyber-resilience strategy for Financial Market Infrastructures<sup>31</sup>; and (v) revising the European Market Infrastructure Regulation (EMIR) to support the growth and resilience of European clearing services and reduce reliance on third-country central counterparties<sup>32</sup>.

As well as supporting the IRE, these developments will give a much-needed boost to global crossborder payments, which are currently expensive, sluggish and not very inclusive<sup>33</sup>.

#### **4. Conclusions**

Before I conclude, let me step back from the technicalities and take a look at the big picture. The rise and fall of global currencies is often seen as a structural process that unfolds slowly and smoothly over time.

History tells us otherwise: in the last century, the dollar overtook sterling as the main invoicing currency in the immediate aftermath of the First World War and equalled its share of global bond issuance around 1929.

However, its rise reversed sharply with the Great Depression, and the two currencies coexisted at the apex of a bipolar monetary system until the 1950s. In short, the making – or unmaking – of an international currency is not only complex, but also volatile, non-linear and less predictable than most people think.

This means that the IRE is not set in stone. Over the next decades, the euro could maintain its role, be relegated to the periphery of the global monetary system, or gain a stronger position at its centre. A combination of factors is needed to strengthen its role.

We need effective macroeconomic policies that deliver macroeconomic stability; a fully-fledged banking and capital market union; and dynamic, future-proof payments and market infrastructures.

The common thread behind these initiatives is that they all reinforce the integration process; they would allow us to build on our past achievements and take the EMU a step closer to a truly integrated monetary, fiscal and political union.

The recipe may seem difficult to implement, but it is what Europe's citizens expect of their governing institutions: the IRE is just another good reason not to let them down. The stakes are high, because the euro is the keystone of

the EMU, and the EMU is much more than just an economic arrangement: it reflects the dedication of its members to European unification.

In times of geopolitical tensions, it also functions as a collective defence clause: any attack against a member affects the single currency, a crucial aspect of our shared sovereignty, and is consequently an attack against the entire Union<sup>34</sup>.

The EMU is the vehicle that generations of Europeans have built to pursue peace, freedom and prosperity together. It embodies their desire to walk and work together on the world stage. As such, it deserves our unwavering support. ■

### **Fabio Panetta is Governor of the Bank of Italy**

## Endnotes

1. At the Helsinki summit in December 1999, the European Council decided to convene bilateral conferences to begin negotiations with Latvia, Lithuania, Romania, Slovakia, Bulgaria and Malta.
2. Seigniorage is the profit made by a central bank (and hence by a government) by issuing currency. This profit can be very significant when a currency is widely used internationally.
3. The expression ‘exorbitant privilege’ was created by Valéry Giscard d’Estaing in the 1960s with reference to the advantages that the United States has due to the US dollar’s role as the global reserve currency.
4. ECB, 2019, *The international role of the euro*; Gourinchas, Rey and Sauzet, 2019, *The international monetary and financial system*, Annual Review of Economics 11, 859-893.
5. Rey, 2019, *International monetary systems and global financial cycles*, Bank of Italy Baffi Lecture on Money and Finance.
6. ECB, 2019, cited.
7. See eg. Cova P, Pagano P and Pisani M (2016), ‘Foreign exchange reserve diversification and the “exorbitant privilege”: global macroeconomic effects’, Journal of International Money and Finance, 67, 82-101.
8. The estimate for the US is taken from Krishnamurthy A, and Annette Vissing-Jorgensen, A (2012), ‘The aggregate demand for Treasury debt’, Journal of Political Economy, 120 (2), 233-267. The paper shows that the discount depends on the debt-to-GDP ratio and is lower when debt is high (implying an ample supply of government bonds). Based on an average debt-to-GDP ratio of about 44 per cent in the pre-2008 data, the authors estimate an average discount of 53 basis points and a seigniorage revenue of 0.23 per cent of GDP. The euro area calculation reported in the text assumes similar debt demand curves for the US and a hypothetical euro area debt issuer, which is clearly a simplification. We apply the discount to the euro area debt-to-GDP ratio observed at the end of 2022, which was 91 per cent.
9. Financial markets provide another perspective on this issue. Bond purchases by central banks, finance ministries and sovereign wealth funds have a large impact on yields: a \$100 billion purchase can reduce the 10-year Treasury yield by 50 basis points over a one-year horizon (see Ahmed, R, and Rebucci, A, 2022, ‘Dollar reserves and US yields: Identifying the

price impact of official flows,' National Bureau of Economic Research Working Paper no. 30476). At the end of 2022, global foreign exchange reserves amounted to €11.4 trillion, of which 80 per cent (around 9.1 trillion) were in currencies other than the euro. Based on the above estimate, and assuming euro- and dollar-denominated bond markets to behave in the same way, a shift of 1% of these reserves (0.9 trillion euros) into euro-denominated bonds could reduce European yields by 45 basis points.

10. *Wall Street Journal*, 'How China manages its currency, and why that matters', 2 January 2024. The share increased from 13 per cent to about 25 per cent between 2020 and 2023.

11. *Wall Street Journal*, 'China's Yuan is quietly gaining ground', 27 December 2023.

12. After the dollar. See *Financial Times*, 'China's renminbi pips Japanese yen to rank fourth in global payments', 21 December 2023. The ranking is based on the currencies' shares in the payments settled through the Swift platform.

13. After the dollar, euro and sterling.

14. See eg. ECB, 2023, *The international role of the euro*.

15. The figures are based on the composite indicator employed in the ECB (2023). The indicator is the arithmetic average of the shares of the euro in stocks of international bonds, loans by banks outside the euro area to borrowers outside the euro area, deposits with banks outside the euro area from creditors outside the euro area, global foreign exchange settlements, global foreign exchange reserves and global exchange rate regimes.

16. Ilzetzki, E, Reinhart, CM and Rogoff, KS (2020), 'Why is the euro punching below its weight?', *Economic Policy*, 35(103), 405-460.

17 Panetta F, 'Europe's shared destiny, economics and the law', *Lectio Magistralis* on the occasion of the conferral of an honorary degree in Law by the University of Cassino and Southern Lazio, 6 April 2022.

18. Monnet, J (1978), *Memoirs*, Collins, London.

19. Medium-term trends show that access to market-based finance for companies has deteriorated, the amount of loans transformed into market instruments such as securitization has fallen significantly, intra-EU integration has deteriorated slightly, while the amount of household wealth in the form of securities has shown little progress, AFME, 'Capital Markets Union. Key Performance Indicators – Sixth Edition', November 2023.

20. Ilzetzki et al (2020), cited.
21. Enria (2021), 'How can we make the most of an incomplete banking union?' Speech at the Eurofi Financial Forum, Ljubljana, 9 September 2021.
22. See Panetta F (2023), 'Europe needs to think bigger to build its capital markets union', Politico, 30 August 2023, and Panetta F (2023), 'United we stand: European integration as a response to global fragmentation', speech delivered at a Bruegel meeting on 'Integration, multilateralism and sovereignty', Brussels.
23. Glowka, M, Kosse, A and Szemere, R, (2023) 'Digital payments make gains but cash remains', CPMI Brief No 1.
24. Panetta, F and Dombrovskis, V (2023), 'Why Europe needs a digital euro', ECB Blog, 28 June 2023.
25. The ECB and the euro area National Central Banks are exploring options for using CBDCs to make cross-currency payments faster, cheaper, more transparent and more inclusive. See CPMI, BISIH, IMF, WB (2022), Options for access to and interoperability of CBDCs for crossborder payments.
26. Panetta, F (2022), 'Demystifying wholesale central bank digital currency', speech at the Symposium on 'Payments and Securities Settlement in Europe – today and tomorrow', hosted by the Deutsche Bundesbank, 26 September 2022.
27. The exploration involves trials and experiments to create a 'technological bridge' between the central bank's currency settlement system and the external private DLT platforms that manage tokenized digital assets. The tests have been conducted independently so far by Banca d'Italia, Banque de France and the Bundesbank. See H Neuhaus and M Plooij, 'Central bank money settlement of wholesale transactions in the face of technological innovation', published as part of the ECB Economic Bulletin, Issue 8/2023.
28. Tests have been successfully carried out on the connection of the instant payment systems of the Eurosystem, Malaysia, and Singapore, using the Bank for International Settlements Project Nexus model. A Proof of Concept was successfully executed between TIPS and Buna, the crossborder and multi-currency payment platform for the Arab region.
29. The Eurosystem Collateral Management System (ECMS) is a unified system for managing assets used as collateral in Eurosystem credit operations. Together with the other TARGET Services offered by the Eurosystem, the ECMS will ensure that cash, securities and collateral flow freely across Europe.

30. MiCA aims to regulate the issuance, offer to the public, admission to trading and provision of services relating to digital representations of rights and value based on DLTs, defined as cryptoassets.
31. The strategy is based on three pillars: (i) fostering the readiness of financial entities by providing a range of tools to assess euro-area payment systems and financial infrastructures; (ii) strengthening the resilience of the financial sector as a whole, by implementing market-wide business continuity exercises; and (iii) enhancing cooperation and information sharing on cyber threats among the major financial entities through the establishment of the Euro Cyber Resilience Board for Pan-European Financial Infrastructures.
32. One of the main measures proposed by the European Commission is that all the relevant market participants would be required to hold active accounts with European CCPs. Other proposed measures are meant to strengthen the existing supervisory framework for EU CCPs. See EUR-Lex - 52022PC0697 - EN - EUR-Lex ([europa.eu](http://europa.eu)).
33. Panetta F (2023), 'The world needs a better crossborder payments network', *Financial Times*, 31 October 2023.
34. Article 42(7) of the Treaty on European Union states that 'If a member state is the victim of armed aggression on its territory, the other member states shall have towards it an obligation of aid and assistance by all the means in their power, in accordance with Article 51 of the United Nations Charter'. This principle was recalled by the EU Heads of State and Government in the Versailles Declaration of 10 and 11 March 2022.

*This article is based on an [address](#) delivered at the Conference Ten years with the euro, Riga, 26 January 2024.*

# Demystifying fears about bank disintermediation

The ECB's Governing Council has decided to proceed with the 'preparation phase'. Ulrich Bindseil, Piero Cipollone and Jürgen Schaaf focus on the debate around the impact of a digital euro on bank funding



**C**entral banks explained early on and in great detail the reasons why they are working on central bank digital currencies (eg. ECB 2020). Despite strong support by consumer organisations (BEUC 2023) and merchants (EuroCommerce 2023), and an overall positive reception by academic economists (eg. Brunnermeier and Landau 2022), there are still critical voices.

Some doubt the usefulness of CBDCs (eg. Waller 2021, Bofinger 2022, *Financial Times* 2023; *The Economist* 2023), while others worry about their potential negative side effects and risks (eg. bank disintermediation). Central bankers have taken these concerns seriously<sup>1</sup> and have not only explained further the rationale for CBDCs but also addressed them through CBDC design choices (ECB 2023c).

In this column, we focus on the debate around the impact of a digital euro on bank funding since the ECB announced the likely design features and the European Commission published its draft regulation on a digital euro. We argue that earlier concerns should be reassessed now that they have been effectively addressed by design choices which need to be incorporated into the analysis.

### **Key design features of a digital euro as of October 2023**

On 18 October 2023, following the conclusion of the investigation phase of the digital euro project, the ECB's Governing Council announced a specification of the functional scope and key features of a digital euro (see ECB 2023c, which aggregates and completes the findings from ECB 2022a, 2022b, 2023a and 2023b).

The Governing Council also decided to proceed with the 'preparation phase' of the project. The preparation phase focuses on additional experiments, selecting service providers, prototyping, and aligning with the ongoing efforts of relevant European co-legislators preparing the legal framework for a digital euro (Cipollone 2023).

The actual decision on whether to issue a digital euro will be taken at a later stage, but not before the legal framework is in place and all functional features have been specified.

Based on ECB (2023c) and European Commission (2023), one can expect the digital euro's features to include pan-European reach, legal tender status, and a high level of privacy. A digital euro would combine all the features of a modern digital payment solution, offering convenience and safety to its users. Just like cash in the physical world, a digital euro would allow citizens to pay with central bank money in the digital world.

*It is now widely accepted that a pan-European digital retail payment instrument is needed to secure Europe's strategic autonomy and to lead the monetary union into the digital age in an integrated manner*

It would fill the gap left by the absence of a European electronic payment solution that is available and accepted free of charge throughout Europe, thereby strengthening the monetary sovereignty and resilience of the currency union (Schaaf and Bindseil 2023).

To avoid an increase in the footprint of the central bank and preserve the economic function of commercial banks, individual digital euro holdings would be limited<sup>2</sup>. Merchants would be able to receive and process digital euro, but not hold them. Moreover, digital euro holdings would not accrue interest.

Last but not least, users would be able to seamlessly link their digital euro account to a payment account with their bank, enabling a ‘reverse waterfall’ mechanism. This eliminates the need to pre-fund the digital euro account for online payments, as any shortfall would be covered instantly from the linked commercial bank account, provided it has sufficient funds available<sup>3</sup>.

### **Earlier concerns have been addressed by the design blueprint**

In the debate about CBDCs, questions concerning their necessity and the risk to bank funding were at the centre of the discussion from the outset. It is now widely accepted that a pan-European digital retail payment instrument is needed to secure Europe’s strategic autonomy and to lead the monetary union into the digital age in an integrated manner.

The continued availability of both central bank money and commercial bank money to citizens anchors the monetary system (as private money is in essence defined by a promise of convertibility into central bank money) and preserves the established competition between the two forms of money for the benefit of citizens<sup>4</sup>.

The debate about the risk of bank disintermediation has evolved differently. In theory, CBDCs could affect financial institutions, as depositors might choose to move money from commercial bank deposits into CBDCs. This could in turn reduce the ability of the traditional banking system to provide credit.

However, central banks (Sveriges Riksbank 2017, ECB 2020, Bank of England 2020) and other public institutions (BIS 2020, CPMI 2018, Mancini-Griffoli *et al* 2018) have analysed the issue in an objective way to prepare for and find ways to tackle such risks, including through modelling and granular empirical research (Adalid *et al* 2022, Meller and Soons 2023). The possible implications for monetary policy implementation and central bank liquidity provision have also been studied in detail (Bindseil 2020, Caccia *et al* 2024).

Banking associations, bank-sponsored think tanks, roundtables (Thomadakis *et al* 2023), and scholars (Bofinger and Haas 2023) have published multiple studies and analyses emphasising the risks of bank disintermediation in the context of the potential issuance of CBDCs in general and of a digital euro in particular. But these analyses – including the most recent bank-sponsored studies (Næss-Schmidt *et al* 2023, Tenner *et al* 2023) – disregard the predictable effects of the intended design of a digital euro.

The combination of the reverse waterfall, a holding limit, and no remuneration will strongly reduce incentives to keep money in a digital euro wallet. Users would rely on digital euro as means of payments rather than of investment – particularly in view of the tendency of money holders to consolidate their liquidity pool. Moreover, banks could always offer higher remuneration to retain deposits (Cipollone 2024).

The digital euro is designed to act as the next level in the development of cash as a means of payment – stepping in to compensate for the declining role of paper money. Moreover, the decision to exclude merchants (and any

other firms) from storing digital euro and to require them to transfer any digital euro position instantly to their bank account will help protect the corporate deposit base of the banking system.

### Revisiting the main concerns

Critics continue to argue that demand for a digital euro would be so high that there would be a large flow of deposits from banks to the ECB. Such an outflow could be problematic in three ways.

First, it is argued that, if a *single* bank is in trouble, it would be very easy to withdraw funds deposited with that bank and move them to the deposit facility offered by the central bank (Kumhof and Noone 2018). However, it is already the case today that retail customers can transfer deposits to another private bank with a single click or tap, sometimes even in real time, or they can invest in a money market fund or government bond. Moreover, there is no limit on such transfers, while holdings of digital euro would be subject to limits.

Second, critics say that, in an acute *economy-wide banking crisis*, a digital euro could lead to accelerated bank runs, which could exacerbate the crisis (EBF 2021, Angeloni 2023a). This is, however, not very plausible, for the following reasons:

- If a limit is applied to digital euro holdings, the ability of customers to withdraw *unlimited* amounts of cash, would be much more relevant from the perspective of banks. Indeed, the disadvantage of cash as a short-term store of value because of safety concerns would be relatively unimportant at such an order of magnitude.
- Even in severe banking crises, many banks are still considered safe (particularly as central banks act as a system-wide lender of last resort). For example, in 2008, during the great financial crisis, but also in the recent

US regional banks crisis, such banks benefited from inflows.

- In recent decades, bank runs have generally not been triggered by large numbers of retail customers withdrawing small deposits, but by incidents in the wholesale market<sup>5</sup> or the withdrawal of very large individual amounts above the thresholds covered by deposit guarantee schemes<sup>6</sup>.

Third, the attractiveness of safe central bank money could lead to *banks losing deposits as a source of refinancing in the long term*. This could put a strain on lending to companies and private households. According to the Association of German Banks, substantial quantities of central bank money could be withdrawn from the banking system, which would restrict the ability of commercial banks to refinance against customer deposits (Tenner *et al* 2023).

However, the combination of a holding limit, zero remuneration, the reverse waterfall, and the absence of corporate holdings of digital euro would imply rather low overall levels of digital euro holdings.

### **Analysis must include banknotes**

What matters is the total amount of central bank money in circulation (Cipollone 2024). Focusing on digital euro alone ignores banknotes in circulation, which would be misleading as both are identical in how they affect the financial accounts of the economy.

Banks experienced elevated demand for euro banknotes during the period of financial stress and low interest rates, but they never raised this as an issue. Between 2007 and 2021, euro banknotes in circulation increased from €628 billion to €1,572 billion, an increase of almost one trillion euros, which is far more than can be expected to be issued in the form of digital euro, given the current blueprint.

The declining use of banknotes for daily transactions will eventually also reduce the structural demand for banknotes. By definition, the purpose of a ‘store of value’ is that it should eventually be spent.

Therefore, the store of value function also relies on the ease at which money can ultimately be spent, so the decline in the use of banknotes also risks reducing their attractiveness as a store of value in the long term.

Indeed, in 2023 the value of euro banknotes in circulation declined for the first time in nominal terms since 2002, by around €5 billion. Even though only 20% of the demand for banknotes can be attributed to domestic payment functions<sup>7</sup> and this trend reversal is probably mainly a reflection of higher interest rates, the digitalisation of payments is also a factor.

Digitalisation in general, even when factoring in the issuance of a digital euro as outlined in ECB (2023c), may well lead to lower real growth in central bank money in circulation than in the past, or even to a decline.

From this perspective, the persistent complaints regarding future volumes of digital euro in studies sponsored by the banking system are not looking at the right variable (which is central bank money in circulation) and outdated (by ignoring the digital euro blueprint).

### **Conclusion**

As the ECB progresses in developing a digital euro, it will continue to refine design choices, address potential risks, and optimise benefits. The investigation phase of the project has yielded innovative design features that would contain the circulation of digital euro while offering benefits to users.

The concerns regarding bank funding have thus been taken seriously. Moreover, the eventual holding limits will be calibrated on the basis of a comprehensive analysis considering all relevant factors (Cipollone 2024).

What really matters for banks in this context is the total volume of central bank money in circulation. Amid the declining use of banknotes, it is likely that nominal growth in banknotes in circulation will diminish or even turn negative.

This suggests a possible scenario of a decline of central bank money in circulation relative to GDP. It is often overlooked that the introduction of CBDCs by central banks is a reaction to the declining role of paper money in payments.

Moreover, new players, like stablecoins, e-money institutions and other narrow bank constructs, some sponsored by Big Tech companies with huge customer bases, do not care about banks and their role in the economy and pose a greater risk to bank funding than CBDCs. Non-banks have no obvious incentive to limit the use of their stablecoins or the services they offer (Panetta 2023), and the use of stablecoins could become significant.

This would hold particularly true if it was accepted that central bank money does not follow digitalisation but stays exclusively in paper form. It seems important that such firms should not be allowed to hold significant customer funds on the balance sheet of the central bank (Bindseil and Senner 2024).

It would be absurd for central banks to limit holdings of CBDCs while allowing unlimited deposits with the central bank from non-bank payment service providers issuing what might be called a 'synthetic CBDC' (ie. a stablecoin backed by central bank deposits).

Banks are barking up the wrong tree when they rely on studies that overlook the outlined design features of the digital euro: in doing so, they ignore the many other challenges they need to address to ensure stable funding through deposits.

Banks have to offer attractive products and services to incentivise customers to hold their deposits at banks rather than migrate to new and powerful private competitors.

And the digital euro is also a unique opportunity for banks, as it will allow them to launch new and innovative products, address new use cases, and extend their scope beyond domestic markets. ■

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## Endnotes

1. Some more radical economists have indeed advocated CBDCs to disintermediate the banking system and have suggested combining the introduction of CBDCs with a prohibition on banks issuing sight deposits. These economists argue that this would improve financial stability, as it would prevent bank runs and, by implication, banking crises. At the same time, it would save taxpayers' money, as banks would no longer need to be rescued and more seigniorage income would be earned by the central banks and passed on to government (Huber 2017, Dyson et al 2016). Central banks and legislators (at least in the EU) have not endorsed these views but instead defended the role of banks and have designed CBDCs accordingly.
2. While the limit will be set based on further in-depth analysis before a possible issuance of a digital euro, an order of magnitude of €3,000 per resident has been mentioned (Bindseil et al 2021).
3. The envisaged offline function of the digital euro would require sufficient prefunding. Moreover, a holding limit and zero remuneration would still apply.
4. As the European Banking Federation (EBF) states: "The banking industry supports a long-term vision of European strategic autonomy in payments and sees that new forms of digital currencies and payment methods will be needed to support the multi-faceted digitalisation of the economy. We envision a future digital economy where Europe has a strong, resilient, innovative and competitive payments and digital asset ecosystem, with enhanced European strategic autonomy" (EBF 2023).
5. Deutsche Bank cut a €67 million trading line to a mid-sized bank, IKB Deutsche Industriebank, on 27 July 2007, during the subprime crisis. IKB's then CEO, Stefan Ortseifen, told a court that Deutsche Bank's decision to cut credit lines had caused immeasurable reputational damage to IKB, crimping its ability to function normally in turbulent markets. Deutsche Bank denied the allegations. IKB became a high-profile casualty of the credit crisis and required several bailouts.
6. For example, the run on Silicon Valley Bank (SVB) in March 2023 started amid rumours about its solvency. According to the Californian supervisory authority, on 9 March alone customers tried to withdraw \$42 billion – a quarter of the bank's total deposits. Individual deposits in the US are guaranteed up to \$250,000. However, more than 90% of SVB's customers had deposits that were significantly higher.

7. Cash used as a means of payment in the euro area accounts for around 20% of the value of euro banknotes in circulation, while the majority of cash holdings relate to its store-of-value function and its use abroad (Zamora-Pérez 2021).

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# The economic outlook and monetary policy in the euro area

Luis de Guindos provides an overview of the latest economic developments and discusses the outlook for the euro area economy for the coming months



**O**ver the past two years, economic developments in the euro area have been shaped by the easing of pandemic-related supply constraints and by the energy price shock in the wake of the Russian invasion of Ukraine. Before that, inflation had been low and monetary policy accommodative, but the surge in inflation to unprecedented levels in 2022 prompted the ECB to normalise and tighten monetary policy.

In December 2021 we announced a gradual reduction in our asset portfolio and in July 2022 we increased our key interest rates for the first time in 11 years. This was followed by nine consecutive hikes that raised interest rates by a total of 450 basis points by September last year.

In 2023 a lot of progress was made in curbing inflation. However, more needs to be done to ensure a timely and sustainable return of inflation to our 2% medium-term target.

In my remarks I will provide an overview of the latest economic developments and the rationale behind the monetary policy decisions that we took in December. I will then discuss the outlook for the euro area economy for the coming months.

### **Inflation**

2023 ended with an inflation rate of just below 3% in December, which was good news. The uptick from November was widely expected, reflecting base effects and the withdrawal of energy support measures. Euro area inflation had been above 10% in October 2022 and at 8.6% at the start of 2023. The decline in 2023 affected all the main components of headline inflation, confirming a broad-based disinflationary process that gained momentum in the second half of the year.

Food inflation has declined substantially from its peak of over 15% in March 2023, but remained high at just above 6% in December. Energy inflation remained deep in negative territory in December, recording the eighth consecutive decline since May 2023.

*Sustainable and investment-oriented fiscal policies aimed at promoting the energy transition, strengthening the resilience of supply chains and increasing euro area productivity are supportive of our price stability goal*

Another important aspect is that core inflation entered a clear downward trajectory, continuing to decline to 3.4% in December. Services prices have been slower to recede, but they fell sharply in November and remained stable in December.

Taken together, these trends reflect the indirect effect of falling energy prices, the easing of supply bottlenecks and the increasing pass-through of our monetary policy tightening to demand. However, high wage pressures, the outcome of upcoming wage negotiations and intensifying geopolitical tensions add on uncertainty around the future path of inflation.

The rapid pace of disinflation that we observed in 2023 is likely to slow down in 2024, and to pause temporarily at the beginning of the year, as was the case in December 2023. Positive energy base effects will kick in and energy-related compensatory measures are set to expire, leading to a transitory pick-up in inflation, similar to what has happened with Spanish headline inflation in recent months.

Inflation in Spain peaked in July 2022, reaching 10.7%, and disinflation set in earlier than in other euro area countries, with the rate coming down to 1.6% in June 2023. Since then, the large drop in energy prices has fallen out of the calculation and inflation increased by an average of 3% between July and December.

### **Economic activity**

By contrast, growth developments are more disappointing. Economic activity in the euro area slowed slightly in the third quarter of 2023. Soft indicators point to an economic contraction in December too, confirming the possibility of a technical recession in the second half of 2023 and weak prospects for the near term.

The slowdown in activity appears to be broad-based, with construction and manufacturing being particularly affected. Services are also set to soften in the coming months as a result of weaker activity in the rest of the economy.

The labour market continues to be particularly resilient to the current slowdown. The euro area unemployment rate stood at 6.4% in November, broadly unchanged from October and close to its historical low.

However, we are seeing the first signs of a correction taking place in the labour market. The latest data on total hours worked show a slight decline in the third quarter, the first since the end of 2020. This is mainly driven by the reduction in the average hours worked offsetting the increase from the rise in employment.

The continuous decline in job vacancy rates, which marginally decreased again in the third quarter, suggests that the ongoing labour market adjustment may also weigh on the number of jobs.

### **Financial and monetary conditions**

With regard to financial and monetary conditions, our past interest rate increases continue to be transmitted strongly to financing conditions, with lending rates for business loans essentially unchanged in November, at over 5%, and mortgage rates increasing to 4%. The tight financing conditions are propagating through the economy, dampening demand and helping to push down inflation.

Before taking its December decisions, the Governing Council closely considered their implications in terms of fragmentation risk and financial stability. Government bond markets are stable, sovereign yield spreads have been resilient to the normalisation of the Eurosystem's balance sheet, and investors have been able to absorb the extra securities released by the reduction in the asset purchase programmes.

Euro area banks have proven resilient, boasting comfortable levels of capital and strong profitability which make them well equipped to withstand adverse shocks. Despite these strong fundamentals, bank valuations remain compressed, pointing to concerns about the long-term sustainability of bank earnings amid weak growth prospects, increased downside risks from deteriorating asset quality, lower lending volumes and higher funding costs.

Direct and indirect links between banks and the lightly regulated non-bank financial sector also pose risks to the financial system as a whole and highlight the need to boost non-bank resilience going forward. The overall outlook thus calls for vigilance and macroprudential policy remains the first line of defence against the build-up of financial vulnerabilities.

### **Monetary policy**

At its December meeting the Governing Council decided to keep the three key ECB interest rates unchanged. This decision was based on the overall assessment of the economic and inflation outlook, as well as the effects of our monetary policy. We believe that the current level of interest rates, maintained for a sufficiently long duration, will make a substantial contribution to the timely return of inflation to our target.

At the last meeting we also decided to advance the normalisation of our balance sheet. We intend to continue to reinvest in full the principal payments from maturing securities purchased under the pandemic emergency purchase programme (PEPP) during the first half of 2024.

Over the second half of 2024, the PEPP portfolio will decline by €7.5 billion per month on average. We discontinued asset purchase programme reinvestment of redemptions in July 2023 and we expect to discontinue the reinvestments under the PEPP from 2025.

The key ECB interest rates are our primary tool for setting the monetary policy stance. Our future decisions will continue to follow a data-dependent approach to determining the appropriate level and duration of restriction.

## Conclusion

The events of the last two years have significantly shaped economic developments in the euro area, pushing up inflation to levels not seen since the introduction of the euro. In response, we started a gradual reduction in our asset portfolio and we increased our policy rates by a total of 450 basis points.

Our strong reaction was key to prevent a de-anchoring of expectations and to curb inflation. In terms of economic activity, the slowdown has so far been contained and gradual. However, the incoming data indicate that the future remains uncertain, and the prospects tilted to the downside.

The inflationary shock that we were confronted with following the energy crisis has been particularly challenging: it occurred in an already difficult environment, with the world economy recovering from the pandemic and global supply chains still disrupted.

Furthermore, supply side shocks are particularly difficult to manage using monetary policy instruments. In this context, sustainable and investment-oriented fiscal policies aimed at promoting the energy transition, strengthening the resilience of supply chains and increasing euro area productivity are supportive of our price stability goal. Structural reforms and investments to enhance the euro area's supply capacity can help reduce price pressures in the medium term.

In this regard, we very much welcome the agreement on the EU's economic governance framework reached a few weeks ago. It is a powerful signal to markets as it reduces uncertainty about fiscal rules in the EU.

The reformed framework will help strike a balance between sustainable public finances and sufficient debt reduction on the one hand and room for reforms and investment on the other, while supporting countercyclicality of fiscal policies.

Achieving this balance turned out to be less straightforward than we might have hoped. It is now crucial that the new fiscal framework is implemented properly and without delay. ■

**Luis de Guindos is Vice-President of the European Central Bank**

*This article is based on a [speech](#) delivered at the 14<sup>th</sup> edition of Spain Investors Day, Madrid, 10 January 2024.*

# Aim far, act now



Growth in the euro area needs to be revitalised.  
Reinhard Felke, Mirko Licchetta, Nicolas Philipponnet  
and Maarten Verwey argue that it is essential to boost  
investment and foster innovation

**H**igh energy prices and rising unit labour costs continue to put euro area export competitiveness under pressure and call for policy attention. Despite the decline in headline inflation in 2023, careful policy coordination is needed to support smooth disinflation and maintain conditions for a gradual recovery.

Given the green and digital transitions and rising risks of geo-economic fragmentation, more investment, innovation and deepening of the Single Market and the Capital Markets Union are required.

The euro area economy is slated for a soft landing, but it is not out of the danger zone. Since its peak in autumn 2022, headline inflation has declined steadily on the back of falling energy inflation, the rapid rise of interest rates, and the orderly tightening of financial conditions (IMF 2023).

At 2.2%, euro area inflation is projected to be back close to target by 2025, according to the European Commission's Autumn Forecast<sup>1</sup> (European Commission 2023a). At the same time, employment remains strong, and financial markets absorbed the reversal of interest rates without much disruption. So far, so good!

Yet, the growth momentum weakened at the turn of the year, core inflation is still elevated, and inflation differentials remain across euro area member states. It is therefore too early to claim victory. In particular, higher energy prices and rising unit labour costs continue to put export competitiveness under pressure and call for policy attention.

Furthermore, old and new structural forces weigh on competitiveness and productivity growth going forward. In addition to demographic change and a high level of legacy debt, weak investment and innovation, the imperative green transition, and a fragmenting geopolitical landscape are posing threats to productivity and potential growth.

In line with the latest recommendations to the euro area (European Commission 2023b), we argue that, in the short term, careful policy coordination is needed to support the smooth disinflation under way and to keep in place the conditions for a gradual recovery of the euro area economy.

*Greater use of the Single Market's potential and more coordinated industrial strategies offer possibilities to accelerate economic growth and bolster competitiveness in the euro area*

At the same time, more investment and innovation are essential to spur long-term growth and enhance productivity and competitiveness in the ongoing green transition. Substantial supply-side reforms and deeper euro area integration are critical in that respect. In particular, a deeper Single Market and progress towards a Capital Market Union hold huge potential for the euro area economy.

Careful policy coordination to ensure continued disinflation and recovery of competitiveness in the short term Ensuring the return of inflation to the European Central Bank's target remains an immediate priority. Continuing to ensure a consistent monetary and fiscal policy mix is critical. Consistent with the new set of fiscal rules agreed by EU economy and finance ministers on 20 December 2023, public debt should be kept at prudent levels or put on a downward trend.

At the same time, fiscal policy should contribute to disinflation. In this vein, delivery on the overall restrictive fiscal stance as envisaged in the 2024 budget plans will be important. Phasing out energy support measures adopted in light of the energy price shock of 2022 will support fiscal consolidation efforts.

To avoid lasting divergences across the euro area, these efforts should be more ambitious in countries that face higher risks of entrenched inflationary pressures.

Differences in inflation across euro area countries declined but remain sizeable (Figure 1), contributing to concerns about cost competitiveness vis-à-vis intra- and extra-euro area trading partners. Differences in the energy intensity of the economies explain most of the country-specific impact of the 2022 common energy price shock on inflation (Coutinho and Licchetta 2023).

Although energy prices receded, divergences in core inflation and unit labour costs remain a concern. Unit labour cost accelerated strongly in 2023, especially in the Baltics and Slovakia, on the back of significant nominal wage increases and stagnant or falling productivity growth.

At the other end of the spectrum, unit labour cost growth was contained in Greece, Italy, and Spain, where it helped re-balance pre-existing weaknesses in cost competitiveness.

Going forward, the relative evolution of unit labour costs will become increasingly important to ensure that today's relative cost disadvantages do not become entrenched. In accordance with national practices and respecting the role of social partners, it is therefore important that further wage increases continue to restore lost purchasing power, especially for low-income earners, taking account of the underlying competitiveness dynamics.

### **More investment and innovation are needed to strengthen competitiveness**

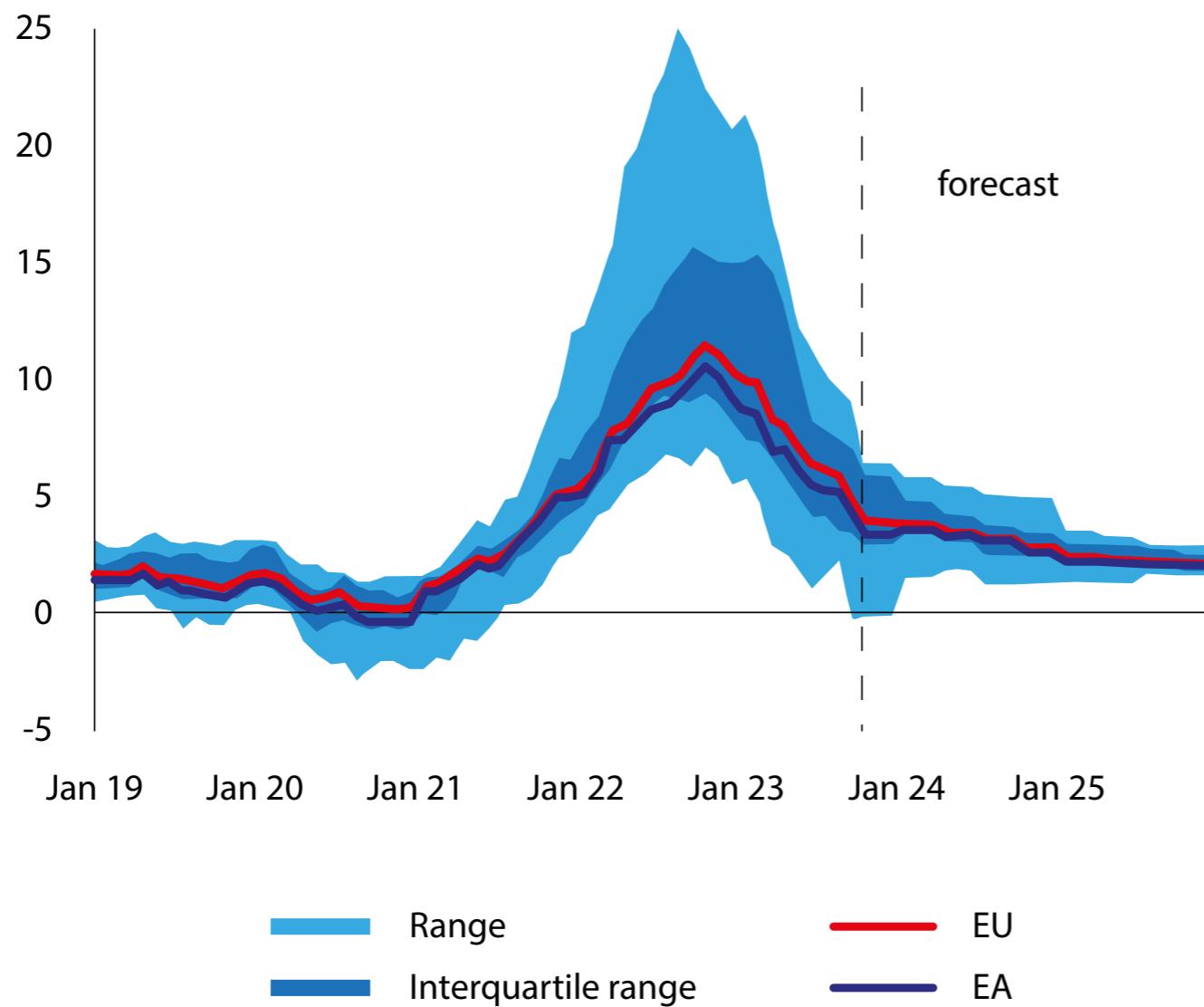
Addressing the structural impediments to competitiveness and growth in a durable way requires a broad set of supply-side policies. Let's start with energy.

Energy prices have come down considerably compared to their peak but are expected to stay structurally higher than before Russia invaded Ukraine. Until major progress is made in renewables, energy will remain considerably more expensive in the euro area than in the US and many other trading partners.

The relative depreciation of the euro in 2021 and 2022 provided only a temporary respite. It is therefore not surprising that energy-intensive sectors, such as chemicals, have seen their trade performance deteriorate (Figure 2) and euro area companies more broadly rate their competitiveness at an all-time low (European Commission 2023c).

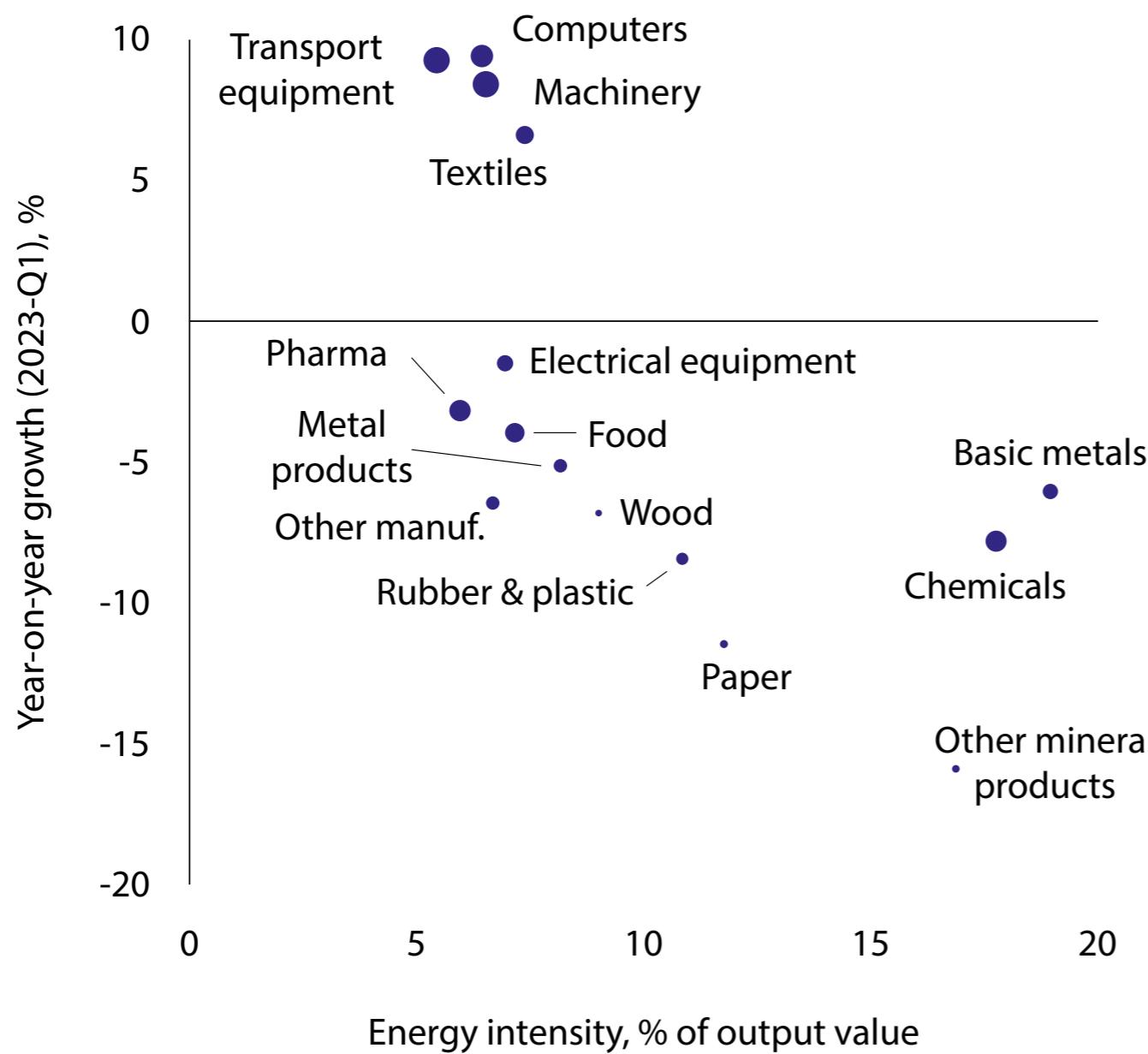
**Figure 1. Range of annual harmonised index of consumer price inflation rates among EU member states**

y-o-y % change



Source: Eurostat.

**Figure 2. Energy intensity and euro area export growth by sector**



Source: Eurostat.

Beyond the recent increase in energy prices, the euro area suffers from a protracted weakening of productivity growth and lack of innovation. Total factor productivity in the euro area has been trailing that of the US economy for many years. More concerning, productivity has been floundering in sectors that are driving aggregate growth, including most notably in the ICT sector (manufacturing of computers and electronics, IT services).

While the decline of the euro area's active population makes labour-augmenting technological progress all the more important, innovation – measured both through the size of the research efforts or through its output in terms of patents – remains weak.

Amid deep economic transformation due to the green and digital transition, the euro area needs substantially more investment. Greater investment boosts labour productivity and drives innovation, enhancing overall productivity (McMorrow *et al* 2010).

Compared to the euro area, the US has seen a much faster increase in capital intensity per worker over the past 25 years (Figure 3) and contributed to strong potential growth in the US.

Since 2019, investment spending on equipment and infrastructure in the euro area has held up, supported by solid corporate balance sheets. Still, major challenges to investment persist, including a shortage of skilled labour and increasing energy costs (Figure 4).

Administrative hurdles, linked in particular to permitting, also undermine investment in the green transition. Going forward, the higher interest rates are set to weigh on investment, particularly on projects with a long time horizon such as research and development. This calls for proactive policies to further support investment, both public and private, in the euro area.

Public investment received a significant boost from the EU through the Recovery and Resilience Facility (RRF), REPowerEU, and cohesion policy funds. The RRF, which is at the heart of the NextGenerationEU recovery instrument, makes available €723 billion in grants and loans to member states until 2026 to support investment and reforms.

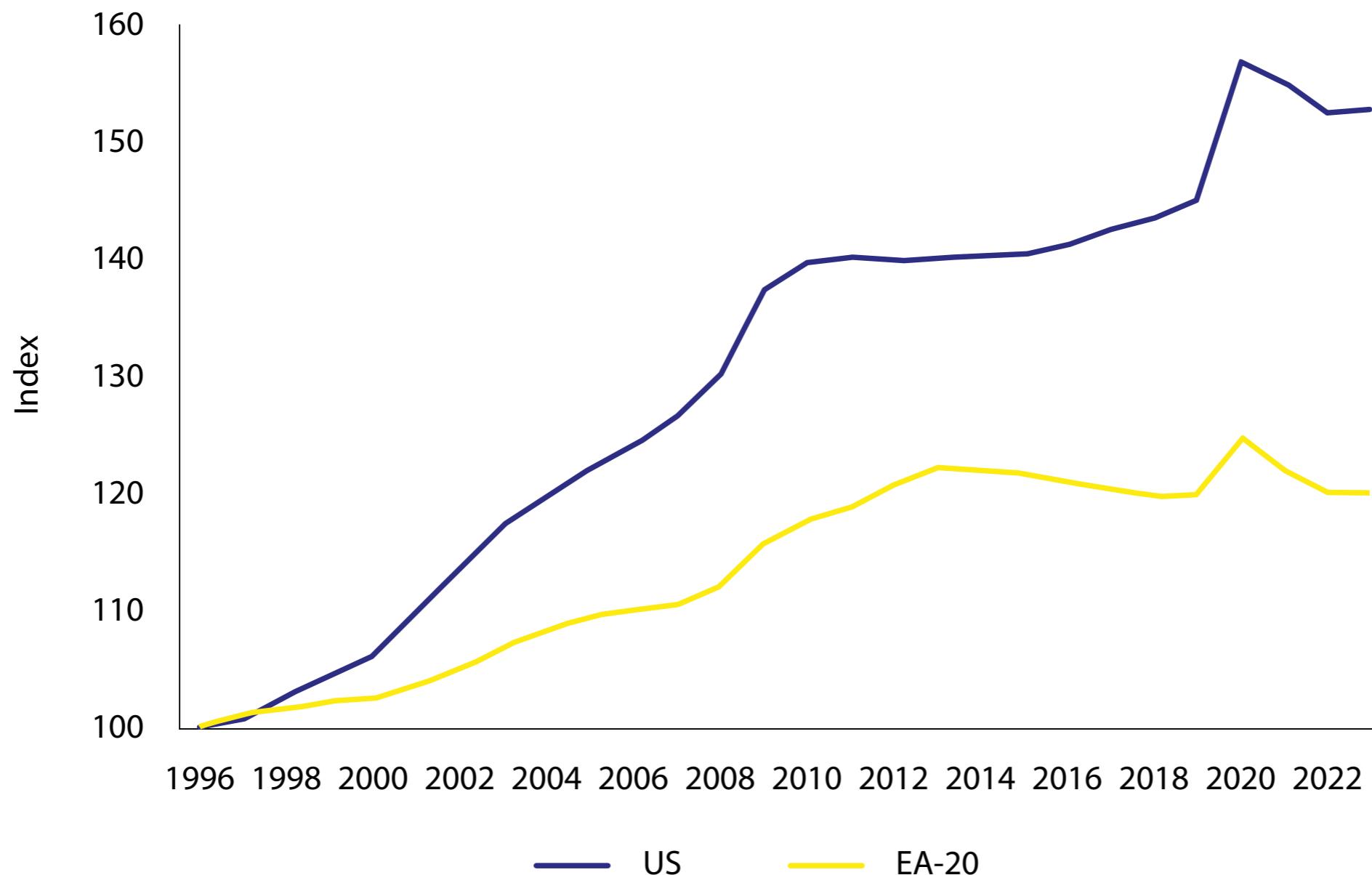
It helps reconcile fiscal consolidation and public investment needs across the euro area. Two years into implementation, the RRF has contributed to the recovery in public investment (Figure 5), including deployment of green technologies, modern digital infrastructures, and green and digital skills development. About €220 billion have been disbursed under the RRF to euro area member states until now. The RRF is also expected to crowd in more private investment (Pfeiffer *et al* 2023).

Cohesion policy funds are a more lasting form of EU support that provides member states with an additional €392 billion to invest in the green and digital transitions over 2021–2027. Along with investment in physical capital, national recovery and resilience plans also support human capital accumulation. Some plans support up- and re-skilling workers that can boost productivity and support the green and digital transition while reducing skills shortages and mismatches.

Concrete progress towards a true Capital Markets Union would help boost private investment and finance innovation. The lingering fragmentation of European capital markets along national lines hinders access to finance and, in turn, innovation and competitiveness (European Commission 2023d).

Fragmented capital markets imply lower competition among financial institutions, high liquidity premia, and eventually a higher cost of funding. There is a strong correlation between greater access to capital markets and lower cost of funding.

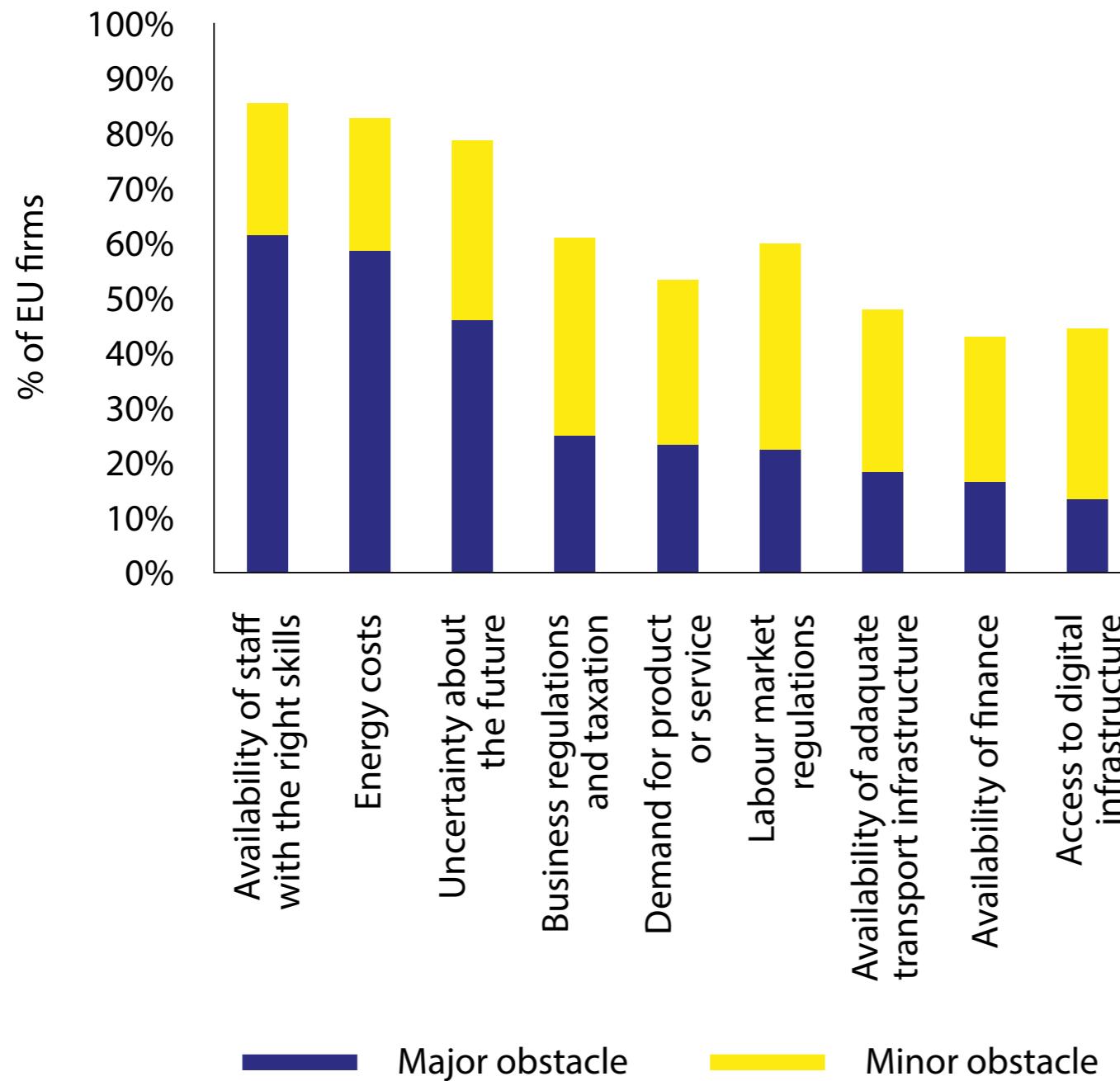
**Figure 3. Capital intensity in the euro area and the US**



Note: Net capital stock at 2015 prices per person employed; total economy.

Source: AMECO.

**Figure 4. Perception of long-term barriers to investment (% of EU firms)**



Notes: (1) Survey answers for question: 'Thinking about your investment activities, to what extent is each of the following an obstacle? Is a major obstacle, a minor obstacle, or not an obstacle at all?' (2) Data for all surveyed firms from all sectors; data for answers for 'no obstacle' and 'don't know/refused' are not shown.  
Source: European Investment Bank Investment Survey (2022).

Robust and liquid capital markets can provide alternatives to bank financing, in particular for innovative companies and start-ups. A deeper Capital Markets Union would thus support private investment while minimising the need for government support.

More generally, deepening the Single Market would provide opportunities to unlock growth and strengthen competitiveness. More than 30 years after the creation of the Single Market, the EU still needs to take full advantage of its sheer size – 450 million citizens, larger than the US population of 330 million – and its potential to increase private investment and innovation (European Commission, 2023e).

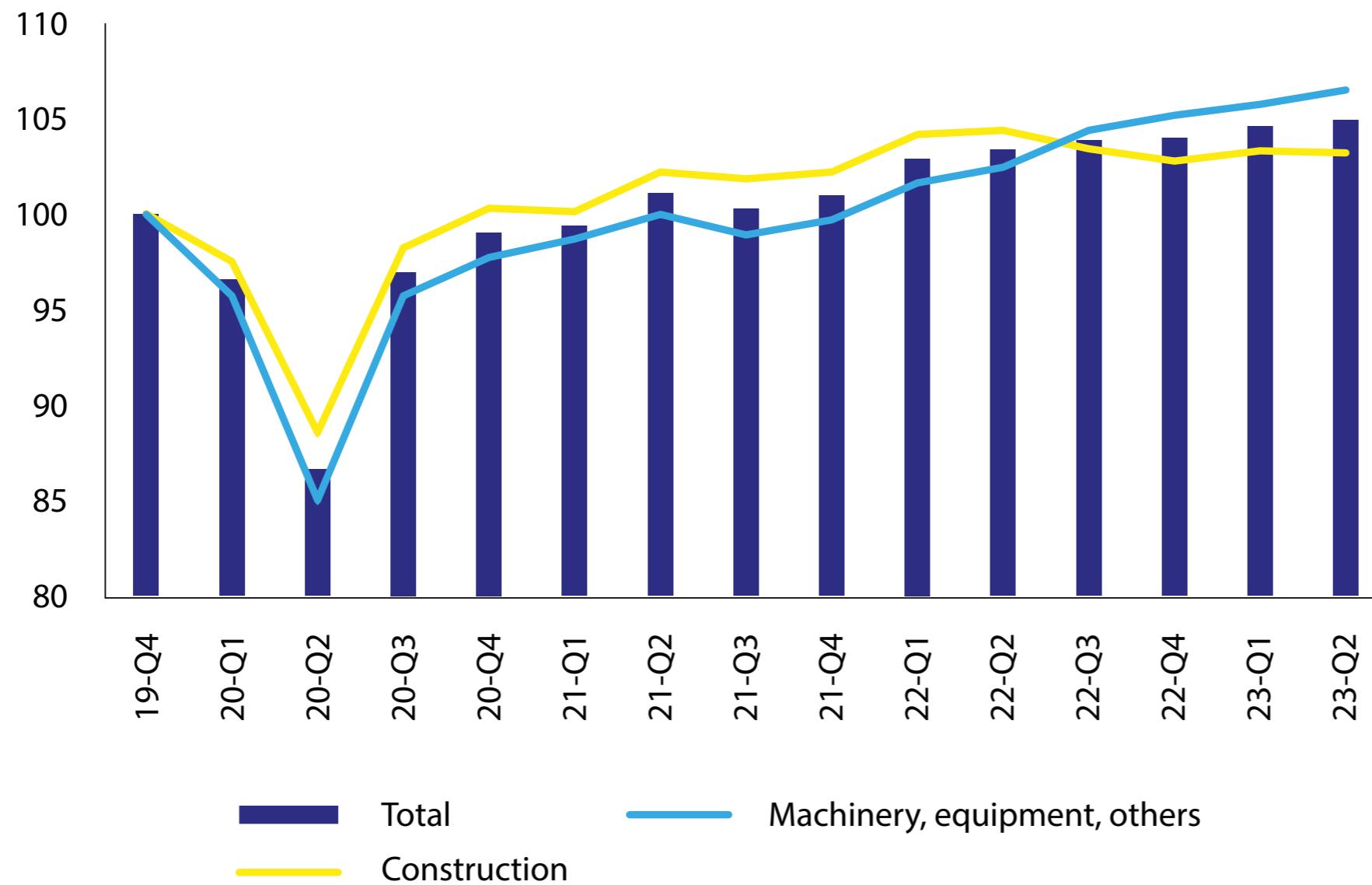
Intensifying EU integration and reducing remaining barriers within the internal market would lead to substantial welfare gains for the euro area and the EU (Baba *et al* 2023). As risks of geopolitical fragmentation increase (Gaal *et al* 2023), deepening the Single Market would also increase the euro area's resilience.

Given its greater trade openness, the euro area has much to lose from a reversal of the global integration of the past decades. In that context, the EU's large and diverse membership, including advanced and emerging market economies, provides the scope and scale to build European-based supply chains.

Greater coordination of member states' industrial policies, building on EU instruments, would help companies reap the benefit of the Single Market. In response to the COVID-19 and energy crises, member states have stepped up support to companies, including in the form of state aid.

However, the proliferation of national schemes runs the risk of destabilising the level playing field within the Single Market. Absent some coordination in industrial strategy, larger member states or those with greater fiscal

**Figure 5. Investment sectoral breakdown, euro area (volumes, 2019 = 100)**



Notes: (1) Public and private investment volumes are calculated based on total investment deflator. (2) Public investment includes aggregates of general government gross fixed capital formation (GFCF) and GFCF financed with RRF grants.

Source: European Commission.

space may have greater scope to support companies, to the partial detriment of other euro area countries and the integrity of the Single Market (Gopinath 2023).

Not fully exploiting the economies of scale at the EU level is also a missed opportunity. Coordinating EU-wide financial support for business investment, as through the Commission's proposed Strategic Technologies for Europe Platform (STEP), would allow a more consistent industrial policy across the euro area.

### **Conclusion**

In the short term, careful policy coordination is crucial to continue supporting the smooth disinflation process and to keep in place the conditions for a gradual recovery of the euro area economy. At the same time, in a year of elections for the EU and as the euro celebrates its 25<sup>th</sup> anniversary, an ambitious economic agenda is called for to restore the euro area's competitiveness and spur long-term growth.

Boosting investment and fostering innovation are essential to support productivity and achieve the ongoing green transition. Greater use of the Single Market's potential and more coordinated industrial strategies offer possibilities to accelerate economic growth and bolster competitiveness in the euro area. ■

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## *Endnote*

1. According to the European Central Bank Macroeconomic Projection (December 2023), headline harmonised index of consumer prices (HICP) inflation is expected to decrease from 5.4% in 2023 to an average of 2.7% in 2024, 2.1% in 2025, and 1.9% in 2026.

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# Heads I win, tails you lose



Unremunerated reserves in the Eurosystem. Robert McCauley and Julien Pinter argue that turning huge remunerated excess bank reserves into zero-yielding required reserves is a tax on banks

**C**entral banks in the euro area are losing money hand over fist. Some economists support a policy that, they contend, would make banks shoulder the losses. In no fewer than four Vox columns last year, De Grauwe and Ji (2023a, 2023b, 2023c, 2023e) propose to turn a large part of the €3.6 trillion in excess reserves<sup>1</sup>, currently paid at the ECB's deposit interest rate of 4%, into unremunerated, required reserves.

They assert that reserve remuneration, at a time of large excess liquidity following the ECB's massive bond purchase programmes, amounts to a 'subsidy to banks' and is 'non-sensical'. They further argue that requiring large unremunerated reserves would not prejudice the ECB's mission (De Grauwe and Ji 2023a)<sup>2</sup>.

With a base of reservable deposits of €15 trillion<sup>3</sup>, each percentage point rise in unremunerated required reserves would seemingly boost the net income of Eurosystem central banks by €6 billion at the current 4% rate. De Grauwe (2023) engaged with Bundesbank President Joachim Nagel as an Invited Speaker at the Bundesbank in September as the ECB (2023) ceased remunerating the 1% required reserve.

In this first column in two-part series, we provide an alternative reading of the proposal to require large unremunerated reserves. We argue that reserve remuneration is not a subsidy to banks. Rather, requiring large unremunerated reserves amounts to a tax on banks, as it is commonly considered (Reinhart and Reinhart 1999, Bindseil 2014).

The policy change ('tails you lose') would not be considered had interest rates stayed low and large-scale bond-buying had produced gains for central banks ('heads I win').

In the second column, we will set out the unintended consequences for the locus of euro bank intermediation of unremunerated reserves.

## **Reserve remuneration is not a subsidy**

De Grauwe and Ji (2023a) charge that remunerating central bank reserves amounts to ‘subsidising commercial banks’. We disagree with this characterisation, especially at a time of abundant reserves. We set out our stall in two sections.

First, we recall how the Eurosystem arrived at remunerated required reserves in a world of scarce reserves. Second, we discuss the ramifications of reserve remuneration in a world of abundant reserves after massive Eurosystem bond purchases.

*When a central bank unexpectedly halts interest payments on reserves after trading them for long-term bonds, it levies a new tax on banks to boost its profit*

## **Genesis: scarce reserves and remunerated required reserves**

In the old, normal times in the euro area, banks demanded reserves from their national central bank to meet reserve requirements, which were by design set above normal clearing and settlement needs.

Formerly, banks obtained these reserves by borrowing at the ECB's refinancing rate against acceptable collateral. Thus, banks paid an interest equivalent to the refinancing rate to secure required reserves.

In the initial negotiations to establish the euro, participating central banks agreed to pay a market-based rate of interest on required reserves, so that banks would not pay much to hold required reserves. The Eurosystem opted for required reserves to establish a deficit in the euro money market, forcing banks to depend on ECB refinancing. And with averaging provisions, required reserves also stabilised short-term rates.

The negotiations rejected the monetarist notion of creating a sharp discontinuity in the returns from holding reserves to tighten the link between reserves and money. Negotiators also rejected requiring unremunerated reserves to boost central bank profits.

This agreement was by no means the only plausible outcome of the euro negotiations in the 1990s. This is the message of an immensely useful 2011 book, *The Concrete Euro*, edited by two clear-headed practitioners who were present at the creation, Paul Mercier and Francesco Papadia.

In negotiations that included the eventual 'outs' as well as the eventual 'ins', seemingly important central banks objected to required reserves and not even a handful of central banks had any experience in remunerating reserves (Galvenius and Mercier 2011, Table 2.2)<sup>4</sup>.

While required reserves were a customary tool of central banks<sup>5</sup>, they contradicted the business model of two European financial centres. Neither the Bank of England, the Riksbank, the Danmarks Nationalbank, nor the Benelux central banks operated with required reserves.

The Bank of England argued that “*a reserve requirement system was inconsistent with market principles*” and the Luxembourg delegation was “*particularly concerned that the application of a reserve requirement system would lead to a relocation of banking business to financial centres outside the euro area*” (Galvenius and Mercier 2011)<sup>6</sup>.

By 1990, when the Fed lowered reserve requirements on non-transaction accounts to zero, this custom was becoming more honoured in the breach than the observance.

The decision to require reserves and to remunerate them at market rates came late, only after it became clear who would be ‘in’ and ‘out’. Still, the weight of the Bank of England and Riksbank in the negotiations arguably tipped the Governing Council to opt to remunerate required reserves as a compromise.

Required reserves were originally set at 2% of specified liabilities, and their remuneration was set originally at the ECB’s refinancing rate, and then at the lower deposit rate in October 2022 (ECB 2023).

### **Today: abundant reserves and unremunerated required reserves?**

Nowadays when abundant reserves more than fully satisfy the needs for clearing balances, the remuneration of reserves is much more consequential. Recall that the Eurosystem loaded commercial banks with excess reserves through its large-scale bond purchase programmes. These are the same excess reserves that De Grauwe and Ji (2023a) would cease remunerating.

When a central bank buys domestic bonds, the seller can be a domestic bank or a domestic or foreign institutional investor. Figure 1 labels the purchase from a domestic bank as A; the purchase from a domestic institutional investor as B (where ‘Insurance’ is a particular case of an aggregate including pension funds and investment funds); and the purchase from a foreign institutional investor as C. A and C are empirically important cases (ECB 2017), as indicated in the figure with the thickness of the bond arrows in black<sup>7</sup>.

Here we focus on purchases from domestic banks, A, to make the case that remunerating reserves is not subsidising banks. But the reasoning only strengthens when the other two other cases are considered<sup>8</sup>.

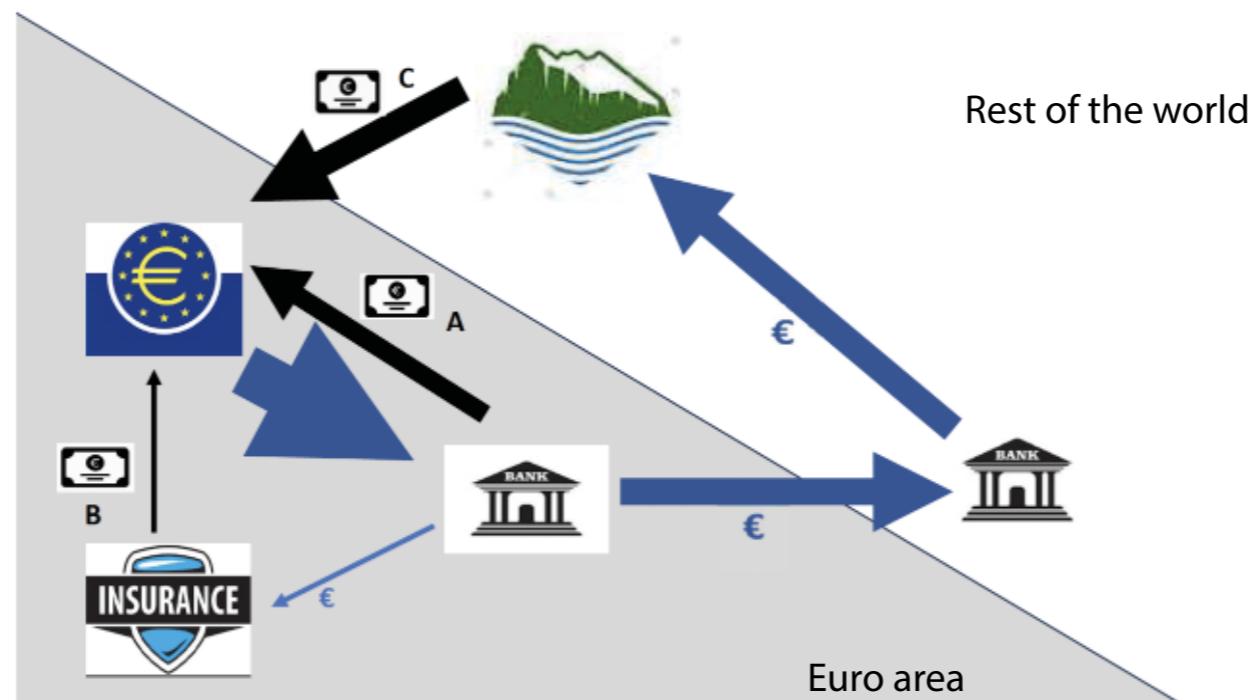
In this case, the central bank exchanged freshly created ‘central bank reserves’ for a bond held by a commercial bank. Banks only agreed to this exchange if they deemed it beneficial. Consider the case in which a commercial bank intended to hold a bond to maturity and considered selling it and holding the asset obtained in exchange for the same period.

The bank would be willing to sell the bond if the present value of the central bank reserves, including remuneration in the event that short-term interest rates again turned positive, is equal to or exceeds the price of the bond<sup>9</sup>.

This stylised representative (bank) agent case assuming a ‘sell and hold’ strategy<sup>10</sup>, highlights a crucial point: banks factored in reserve remuneration in the states of the world with positive interest rates when selling bonds to the ECB during QE.

Moreover, banks set loan and deposit interest rates based on anticipated reserve remuneration. Recall that the ECB had from its inception remunerated reserves at its policy rate, so only the most imaginative bankers would have factored in the possibility of the ECB’s requiring large unremunerated reserves.

**Figure 1. ECB bond buying (quantitative easing): flow of funds**



Note: Width of arrows is proportional to the size of the flow in ECB, 2017, not including 'other sectors' residual. Insurance represents insurance companies, pension funds and investment funds.

Source: Avdjiev et al (2019); authors' adaptations.

From the bank's point of view, the imposition of large unremunerated reserves amounts to an unforeseen income loss owing to a central bank's unilateral decision. Unlike a government treasury opting to forgo coupon payments on its bonds, the imposition of large unremunerated reserves is perfectly legal. This unexpected income loss of the bank amounts to an unexpected tax levied by the central bank.

Instead of regarding the act of remunerating central bank reserves as a subsidy, one should thus see the act of ceasing to remunerate central bank reserves as the imposition of an unexpected tax on euro area banks, consistent with Bindseil (2014, Chapter 8).

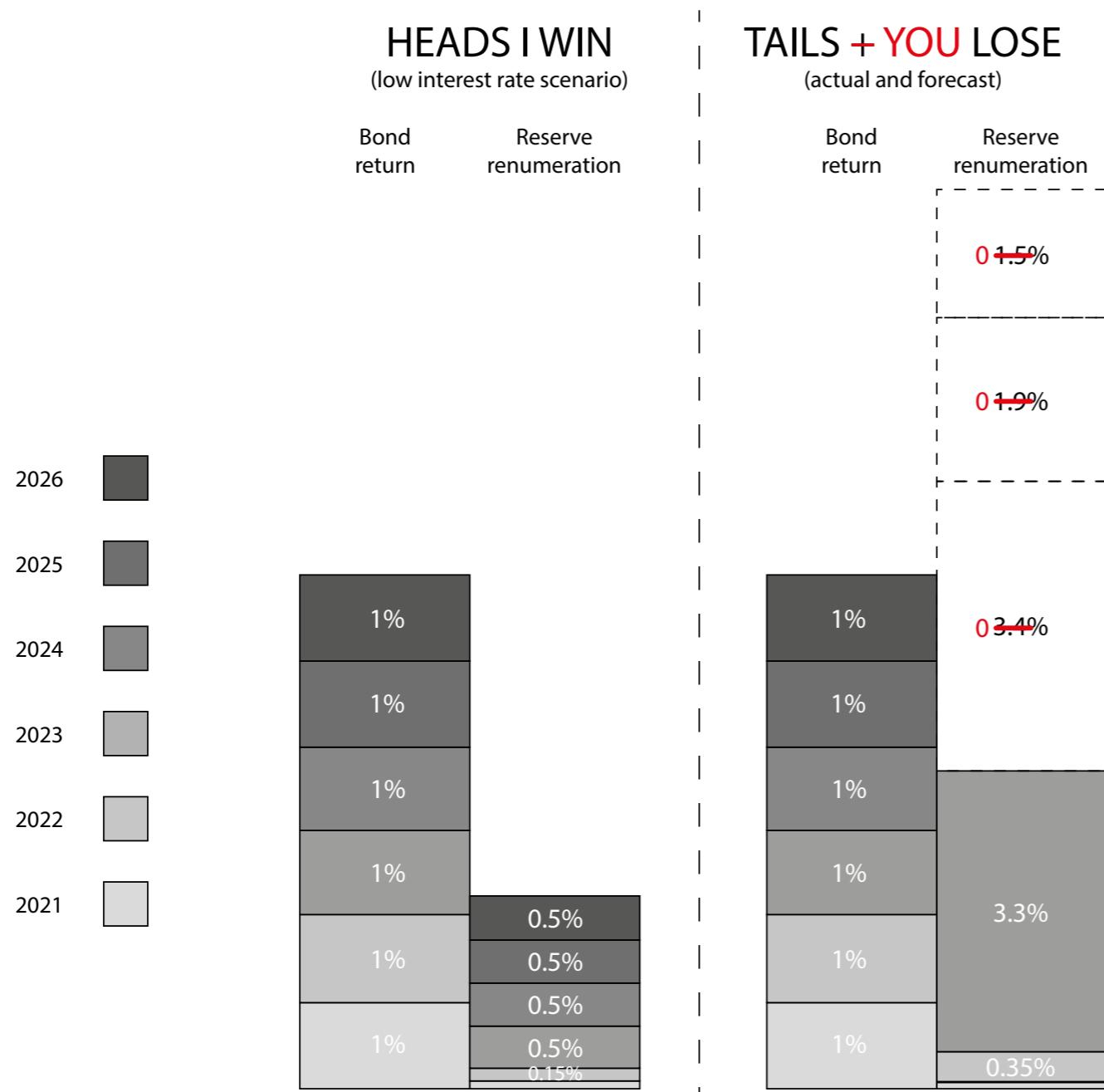
Let us review the bidding. In the case considered, central banks exchanged their floating rate IOUs for a fixed-rate bond held by the banks. Interest rates subsequently increased much more than anyone expected at the time of the purchases. As a result, commercial banks benefitted from the exchange, holding floating-rate central bank reserves instead of the fixed-rate bonds. The interest rate rise has also led to financial losses for the central bank, making quantitative easing (QE) seem ex-post disadvantageous, from a narrow viewpoint of the central bank finances<sup>11</sup>. If interest rates had remained very low or even negative, the situation would have differed: central banks might have profited from the exchange over the entire bond holding period while still remunerating reserves.

Essentially, De Grauwe and Ji's (2023a) proposal arrives when an unfavourable outcome for central banks' finances has materialised and suggests that central banks change their means of payment from something akin to a floating-rate note into something resembling a banknote that pays no interest. This is all very legal, but perhaps not well advised.

Figure 2 illustrates this 'heads I win, tails you lose' approach with the case of the Eurosystem's buying a six-year bond yielding 1% a year in 2021 from a representative bank. The left panel considers a counterfactual scenario in which the ECB deposit rate remains at low levels.

## Figure 2. Heads I win, tails you lose

Returns to the ECB and commercial bank from purchase of a 6-year bond at the start of 2021



Note: Both panels profile on the left the returns of a 6-year bond yielding 1% per year bought by the central bank at the beginning of 2021, and on the right the remuneration of bank reserves that served as the means of payment. Each rectangle in a column represents the return in a given year, with its height proportional to the return. The left panel profiles the returns in a counterfactual scenario in which the ECB deposit facility rate was 0% in 2021 (as it was for reserves exempted from the negative deposit interest rate), 0.15% in 2022 (as it was on average), and then remained at 0.5% in 2023-2026. Over the entire holding period, the bond return (6%) exceeds reserve remuneration (2.15%): the ECB wins, the bank loses. The right panel profiles the actual returns through 2023 and then forecasts from the ECB's Survey of Professional Forecasters for 2024-2026, allowing the deposit facility rate gradually to decline to 1.5% in 2026. Over the entire holding period, reserve remuneration (10.45%) exceeds the bond return (6%): the ECB loses, the bank wins. Zeroing reserve remuneration lops off the right bar at 2023: the bank loses, the ECB wins.

The right panel considers the actual ECB deposit rate through 2023 and then plots forecasts for it in 2024 through 2026 from the ECB's Survey of Professional Forecasters (SPF)<sup>12</sup>. Red edits in the right panel indicate the effect of a decision to stop remunerating reserves from 2024 on: the policy lops off the return received by the banks at the end of 2023. In both panels the ECB wins, and the banks lose, in the right panel because of the decision to cease remunerating reserves.

Banks would remember such a 'heads I win, tails you lose' approach. Governor Pierre Wunsch of the National Bank of Belgium has warned: "*We need to be very cautious... Next time we need to use QE, I wouldn't like to see banks having to run the probabilities of this leading to losses for central banks and speculating whether they need to boost buffers as we might tax them later*" (Kaminska 2023).

### **Conclusion**

In conclusion, the remuneration of reserves does not suffer from a 'lack of economic foundations', especially when reserve demand is sated, and marginal liquidity services are zero. When a central bank unexpectedly halts interest payments on reserves after trading them for long-term bonds, it levies a new tax on banks to boost its profit. Any prospective usefulness of central bank bond buying ('QE') advises caution in taking such a step. In the second column in this series, we question the frequent assumption that bank owners or bank borrowers would pay the tax imposed by large unremunerated reserves. ■

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## Endnotes

1. See Eurosystem consolidated statement | ECB Data Portal ([europa.eu](https://europa.eu)).
2. See also DeGrauwe and Ji (2023d, 2023).
3. For the July 2023 datum, see <https://data.ecb.europa.eu/publications/ecbeurosystem-policy-and-exchange-rates/3030611>.
4. Three central banks had experience with remunerating reserves, perhaps because of their inflation history. The Bank of Portugal paid market rates on required reserves, while the Bank of Italy and the Central Bank of Ireland remunerated required reserves partially.
5. Keynes interpreted the minor expense of low required reserves as a fee for banks' participation in a central bank-managed payment system: "The custom of requiring banks to hold larger reserves than they strictly require for till money and for clearing purposes is a means of making them contribute to the expenses which the central bank incurs for the maintenance of the currency" (Bindseil 2014, p. 107).
6. As financial centres, London and Luxembourg had profited from the relocation of dollar and Deutsche mark deposits, respectively.
7. To anticipate the argument of the next column, it is worth noting that the foreign institutional investors accumulated offshore euro deposits as they sold euro-denominated bonds to the Eurosystem (Avdjiev et al 2019).
8. In all cases, the commercial banks in the euro area are the only entities able to hold central bank reserves, the means of payment of the Eurosystem.
9. We neglect here the liquidity service of reserves, since, with abundant reserves (as quickly became the case after quantitative easing was launched), the value of this liquidity service of reserves is zero (Woodford 2012, p 51).
10. Avdjiev et al (2023) outline that the seller has four options to dispose or not of the proceeds received from the buying central bank, of which the 'sell and hold' is one. Our point extends to all other cases beyond the 'sell and hold', to the extent that the ultimate holder of central bank reserves factors in the remuneration of central bank reserves when exchanging another asset for the reserves.

11. This does not take into account the positive financial effects of quantitative easing on the public finances through its lowering of interest rates on bonds that were not bought by the central bank or through its positive impact on the economy and thus on tax receipts.
12. [https://www.ecb.europa.eu/stats/ecb\\_surveys/survey\\_of\\_professional\\_forecasters/html/index.en.html](https://www.ecb.europa.eu/stats/ecb_surveys/survey_of_professional_forecasters/html/index.en.html). For the periods for which we do not have Survey of Professional Forecasters (SPF) forecasts (second semester of 2025 and 2026), we assume that the deposit facility rate gradually declines to 1.5% and remains at this level for 2026.

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# Tax incidence and deposit relocation risks



Unremunerated reserves in the Eurosystem. Robert McCauley and Julien Pinter argue that imposing unremunerated reserves on euro area banks would likely push bank intermediation offshore out of the euro area

In the first of this pair of Vox columns, we argued that the Eurosystem's payment of 4% on €3.6 trillion in excess reserves held by banks in the euro area is not a subsidy. Rather, requiring large unremunerated reserves would amount to a tax on intermediation.

Discussion of this proposal often assumes that bank shareholders would pay the tax (De Grauwe 2023, De Grauwe and Ji 2023a, 2023b, 2023c, 2023d, 2023e, 2023f). That is, banks would repurchase fewer shares, banks would pay smaller dividends, or bank share prices would appreciate less.

This is the obverse of the contention that remunerating excess reserves has transferred profits from central banks to commercial banks, profits that arise from the monopoly of money creation (De Grauwe and Ji 2023c).

Bank analysts at Standard and Poor's, a major rating agency, agree that bank profits would suffer (Charnay and Hollegien 2023). Kwapil (2023), for example, is not sure whether bank shareholders, borrowers, or depositors would pay.

Many participants involved in the debate consider that making bank owners pay is fair. After all, the authorities supported euro area banks in 2008, 2012, and 2020. Banks took then and should now receive less. This would buttress the income of euro area central banks, which are losing money hand over fist holding low yielding bonds. Turnabout is fair play.

This column weighs in on the debate over who would pay: bank shareholders, bank borrowers, or bank depositors. We argue that the evidence of the eurodollar market from the 1970s to 1990 points to the depositor of euros in euro area banks as the likely taxpayer, thanks to bank arbitrage between offshore and onshore deposits.

We further argue that businesses and households could shift trillions of euro deposits to London and other offshore centres. Smaller and less wealthy depositors would pay the tax. Since not all depositors would sit still for the tax, it would raise less revenue than its proponents suggest.

*Trillions in euro deposits would relocate to London, leaving smaller, less wealthy depositors to pay the tax. As a result, the projected improvement of euro area central bank income from large unremunerated reserves is likely overstated*

We also argue that the imposition of large unremunerated reserves would result in a substantial increase in the share of domestic intermediation by unregulated shadow banks. Ultimately, a further increase in unremunerated reserve requirements must be assessed in terms of its likely impact on the euro area's bank-dominated financial system and its implications for financial stability.

### **Immobile domestic depositors would likely pay the tax**

As De Grauwe and Ji (2023a, 2023d) point out, ceasing to remunerate bank reserves will result in an immediate reduction in bank income. They note that, in the limit, this could imply that "*12% of the balance sheet of these credit institutions would be tied up in non-interest-bearing assets*" (De Grauwe and Ji 2023d).

Lead European bank analysts at Standard and Poor's, a major rating firm, conclude: "*For eurozone banks in aggregate, and all else being equal, we estimate that a one percentage point increase in MRR [(unremunerated) minimum required reserves] could lead to an immediate gross reduction in profit before tax by 3.3%*" (Charnay and Hollegien 2023).

A ten percentage point hike in required reserves would thus presumably cut euro area commercial bank profits by a third. But the story would not end there.

Banks would then seek to restore their overall interest rate spread and retain their profitability relative to capital. To do so, banks might either increase the rate at which they lend or decrease the rate at which they remunerate deposits. De Grauwe and Ji (2023a, 2023d) mention the first possibility, but not the second. On the one hand, the former would align with the ECB's strategy to fight inflation<sup>1</sup>.

The latter, on the other hand, would run counter to that strategy. Lower deposit rates would discourage saving and encourage consumption (Kwapil 2023).

The general right answer to the question of whether bank depositors, bank borrowers, or bank shareholders would pay the tax is that it depends on the elasticity of deposit versus loan demand (Reinhart and Reinhart 1999). In this case, however, the experience of the eurodollar market over a generation suggests a clear answer to the question of who would pay the tax.

Aliber (1980: 513), in an article which has aged as well as its author, put it this way:

*A major concern is whether the major beneficiaries of the reduced costs of providing banking services in the offshore market [arising inter alia from the absence of unremunerated reserves] are the depositors, the borrowers, or the intermediaries. In general, the additional interest payment to the depositors is equivalent to the interest-equivalent of the cost of the reserve requirements.*

The evidence of the eurodollar market from the 1970s until the Fed lowered the reserve requirement on large domestic certificates of deposit to zero in 1990 strongly points to the conclusion that the domestic depositor pays<sup>2</sup>. That is, immobile domestic depositors paid the tax imposed by required reserves, not shareholders or bank borrowers.

Consistent with Aliber (1980), US and foreign banks responded to the Fed's unremunerated reserves on time deposits by arbitraging the London and New York dollar markets to equalise the all-in costs of eurodollar deposits and large domestic certificates of deposit.

As a result, the benchmark three-month dollar Libor typically exceeded domestic US certificate of deposit yields by the cost of the reserve requirement plus the cost of deposit insurance (Kreicher 1982, McCauley and Seth 1992).

Depositors who insisted on depositing in a bank in the US rather than in London or the Caribbean paid for the privilege.

### **Offshoring euro deposits to London**

Would euro area bank depositors sit still for large, unremunerated required reserves? Or would they shift euro deposits to banks outside the euro area? What would prevent ING, Ltd, in London from marketing euro-denominated deposits over the internet to households and firms in the euro area?

Recall that such a deposit is not part of the aggregate of deposits in the euro area that is subject to the now unremunerated required reserve (ECB 2002), and that a very large offshore deposit market in euros already exists and does not need to be created<sup>3</sup>.

Depositors could command a higher yield without taking any foreign exchange risk and while taking only negligible country risk<sup>4</sup>. At an interest rate of 4% and with a 15% (or 10%) unremunerated reserve, ING could likely offer its internet customers up to 60 (or 40) basis points more on a UK euro deposit than on the same deposit booked in the euro area<sup>5</sup>.

Europeans may not have taken to electronic banking as much as the Californians that staged lightning bank runs last March, but they could learn fast with large enough incentives. In addition to such direct marketing of offshore deposits, what would prevent euro SICAVs in France and euro money market funds in Luxembourg from losing their home bias, as did US ‘prime’ money market mutual funds a generation or two ago (Baba *et al* 2009)?

Sixty or 40 basis points is not small change. After the post-crisis Dodd-Frank Act widened the base for the Federal Deposit Insurance Corporation charge of just eight to ten basis points, a half a trillion dollars of US deposits moved from offshore to onshore within months in 2011-12 (Kreicher *et al* 2014, McCauley and McGuire 2014).

A similar response to the larger tax wedge from a 15% or 10% unremunerated required reserve in the euro area could induce €3-4 trillion of the €15 trillion in reservable deposits in the euro area to shift to London or other centres.

As a result, the boost to euro area central banks' net income – the tax collected – would fall short of projections that presume that euro area depositors would sit still.

The comprehensiveness and timeliness of euro area money and credit statistics would suffer, but greater damage could be done to financial stability. A 60 or 40 basis point wedge would favour not only offshore euro deposits but also onshore nonbank financial intermediation.

Banks would lose business to shadow bank competitors with inadequate capital, fair-weather liquidity, and no lender of last resort. While large unremunerated required reserves may be intended to stick it to the banks, bank depositors and the public interest in financial stability could prove to be the big losers.

### **Conclusion**

Depositors of euros in euro area banks would likely bear the cost of large unremunerated reserve requirements. Businesses and upper-income households could easily relocate their euro deposits to jurisdictions at the edge of the euro area that do not pose much legal or country risk.

Trillions in euro deposits would relocate to London, leaving smaller, less wealthy depositors to pay the tax. As a result, the projected improvement of euro area central bank income from large unremunerated reserves is likely overstated.

A welfare-optimising level may exist for a positive unremunerated reserve requirement. This level should consider not just the central bank's profit but also the tax's effects on the euro area banking system's structure and competitiveness. De Grauwe and Ji's (2023d) analysis sidesteps these issues. Further study is warranted on the welfare-optimising level of (un)remunerated reserve requirements. ■

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## Endnotes

1. Fricke et al (2023) show that banks with larger holdings of excess reserves supply more loans, suggesting that the ECB's tightening has had less effect owing to the large excess reserves. More generally, the effect of monetary tightening is attenuated by either public sector debt at floating interest rates (which rose with QE) or private sector debt at fixed interest rates (BIS, 1995).
2. This section draws on McCauley (2023a) and the next on McCauley (2023b).
3. Putting aside the crossborder deposits within the euro area, London is a larger international banking centre than all the euro area centres combined (Demski et al 2022). Banks in London report €1.7 trillion in euro-denominated liabilities, mostly to non-banks.
4. If ING UK holds the counterpart asset as a deposit in ING Amsterdam bank, the latter's liability would be reservable (ECB 2002). Similarly, in the US case, from 1970 until 1990, net due to positions of US chartered banks to their foreign affiliates were reservable typically at the same rate as large-denomination certificates of deposit (CDs). However, ING could simply rebook loans from Amsterdam to London. If such assets were extraordinarily included in the reserve base, as they were by the Fed, then ING could simply book freshly originated loans in London. In the US case, the eurodollar reserve requirement also included loans made by US-chartered banks' foreign branches to US residents. But this extraterritorial reach of the reserve requirement was not applied to banks without a US charter, giving foreign-headquartered banks a competitive edge in the US corporate loan market (McCauley and Seth 1992).
5. That is,  $.04 \times .15 = .006$  or  $.04 \times .10 = .004$

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# Fighting inflation fairly and effectively

A two-tier system of reserve requirements is needed to reduce the size of transfers to banks. Paul De Grauwe and Yuemei Ji answer their critics



**A**s part of its policy of fighting inflation, the ECB and the central banks of the Eurosystem transfer large amounts of money to banks. At this moment this transfer amounts to €140 billion a year. This is almost as much as total yearly spending by the EU which amounts to €168 billion.

The latter is the result of an elaborate political decision process; the former has been decided 'in smoke-filled rooms' without any political debate. In addition, EU spending is loaded with conditions that recipients have to satisfy, whereas the transfers to banks have no strings attached. Similarly large transfers also exist in the US and the UK.

Such a large transfer of money to bankers raises issues of fairness. We have proposed to introduce a two-tier system of minimum reserve requirements (MRRs) that would allow policymakers to reduce the size of these transfers while at the same time enhancing the effectiveness of its monetary policies in reducing inflation (eg. De Grauwe and Ji 2023, 2024).

Our proposal has been subject to criticism by several observers, which we believe reflects popular views in the financial sector and may concern policymakers. Four points of criticism have been raised: (1) imposing unremunerated minimum reserves is an unfair tax on banks; (2) this tax will lead to large displacements of bank activities; (3) due to the heterogeneity of banking sectors, our proposal will be felt very differently in different countries; and (4) minimum reserve requirements affect the transmission of monetary policies and may weaken its effectiveness in fighting inflation. In this column, we intend to answer these criticisms.

### **Imposing minimum reserve requirements is an unfair tax on banks**

Bofinger (2023) and McCauley and Pinter (2024a) claim that imposing unremunerated minimum reserve requirements is an unfair tax on banks. The essence of the argument runs as follows.

In the context of quantitative easing (QE), banks sold government bonds to the central banks because they expected future increases in the interest rate on bank reserves that they accepted to hold in exchange for the bonds. Thus, if today the central banks were to decide to stop remunerating these bank reserves, they would unfairly ‘tax’ the banks.

*The EU struggles to find funding for Ukraine, for the energy transition, and for compensating farmers who are hit by the need to change farming to reduce global warming*

The fact that these transfers now take vast proportions is perfectly all right to these authors because this large increase in the interest rate since 2022 was expected by the bankers during 2015-19 when quantitative easing was at its height and conditioned their willingness to sell the bond to the central banks at that time. It would be unfair to the bankers to deprive them of this €140 billion, even if this deprivation were only partial, as we proposed in our contributions.

The problem with this argument is that there is no evidence that, during the periods of quantitative easing (2015-19) and (2020-2021), bankers, or anybody else, were expecting dramatic increases in the interest rate that we have seen since 2022.

In Table 1, we notice that, during 2015-2021, yields of the long-term government bonds for most euro area countries were below 1%. For example, the average German government bond yield was 0.03%. This implies that from 2015 to 2021 the forecasts in financial markets of the short-term interest rates for the next ten years were close to zero.

Bankers sold the bonds to central banks freely because the central banks offered a high price for these bonds, making these transactions profitable for the banks even under the prevailing expectations that the interest rates would remain low during the duration of these bonds.

The unexpected increase in the interest rate since 2022 therefore created a large windfall profit of €140 billion for banks (on a yearly basis), at the expense of the taxpayers. It is therefore quite misplaced to suggest, as McCauley and Pinter do, that the central banks won twice ('heads I win, tails you lose'), while the bankers lost in both cases.

**Table 1. Ten-year government bond yields 2015-2021 (%)**

Country	2015	2016	2017	2018	2019	2020	2021	Average
Belgium	0.84	0.48	0.72	0.79	0.19	-0.15	-0.01	0.41
Germany	0.50	0.09	0.32	0.40	-0.25	-0.51	-0.37	0.03
Ireland	1.18	0.74	0.80	0.95	0.33	-0.06	0.06	0.57
Spain	1.73	1.39	1.56	1.42	0.66	0.38	0.35	1.07
France	0.84	0.47	0.81	0.78	0.13	-0.15	0.01	0.41
Italy	1.71	1.49	2.11	2.61	1.95	1.17	0.81	1.69
Netherlands	0.69	0.29	0.52	0.58	-0.07	-0.38	-0.33	0.19
Austria	0.75	0.38	0.58	0.69	0.06	-0.22	-0.09	0.31
Portugal	2.42	3.17	3.05	1.84	0.76	0.41	0.3	1.71
Finland	0.72	0.37	0.55	0.66	0.07	-0.22	-0.09	0.29

*Note: Greece is not included as it was not qualified for the QE programme (2015-2019)*

*Source: Eurostat*

The bankers sold the bonds to the central banks and made a profit doing so, otherwise they would not have engaged in such a transaction. When the interest rates increased unexpectedly, bankers collected the manna that fell from heaven and won a second time.

To argue the opposite without providing any empirical evidence, like the authors do, is surprising. It leads to the equally surprising conclusion that a ‘tax’ on banks would be unfair to the bankers and their shareholders.

But let us accept that our proposal of only remunerating part of the bank reserves is an unfair tax imposed on the banks. Banks routinely do not remunerate the demand deposits held by their customers (except for big holders of these demand deposits).

If the non-remuneration of the deposits held by commercial banks at the central bank is an unfair tax, then the non-remuneration of demand deposits issued by banks and held by the non-banking sector is an equally unfair tax. And a larger tax because the size of these demand deposits is larger than the bank reserves.

Why is it unacceptable that central banks ‘tax’ the banks by not remunerating their deposits and is it acceptable that banks ‘tax’ their customers by not paying interest on their demand deposits? In both cases, the services provided are the same. The central banks provide a highly liquid asset to the banks, and the latter provide a highly liquid asset to the non-banking sector.

There is a difference, though. The liquid asset provided by the central bank is not only the ultimate liquid asset but also the safest possible one; safer than the demand deposits provided by the banks to the non-banking sector. If anything, the demand deposits should be remunerated more than the bank reserves because they are riskier than bank reserves. Today this is not the case in the euro area.

### **Minimum reserve requirements and footloose banks**

Bofinger (2023) and McCauley and Pinter (2024b) argue that the imposition of unremunerated MRRs would lead to large-scale displacements of banking activities.

In particular, euro area banks that would face larger unremunerated MRRs would move the deposits held by their customers to countries with no, or lower, MRRs and perform their lending activities from these countries. This would have dramatic effects on the banking sectors in the euro area.

First, some empirical perspectives. There is a long tradition of the use of MRRs in Europe. Prior to the creation of the euro area, several countries like Germany, France, and Italy used MRRs, sometimes exceeding 10% of deposits. No such terrible displacements of banking activities took place. Today, Switzerland uses a 2.5% MRR (in contrast to the 1% used in the euro area) and one is still waiting for the large displacement effects.

Second, every regulation leads to attempts to evade these. Is this a reason not to impose the regulation? Take the example of minimum capital ratios. Most economists agree that minimum capital ratios are essential for maintaining a stable banking system. But, bankers dislike minimum capital ratios, and therefore also try to evade this regulation.

That does not mean that we should abstain from imposing minimum capital ratios. What we should do instead is to design a regulatory system that minimises the evasion. Here is how to do this.

If these displacement effects following the imposition of a two-tier system of MRRs were to occur, the ECB could easily counter these by using an asset-based system of reserve requirements (Schobert and Yu 2014). This would consist in computing minimum reserves as a percent of total bank reserves.

Thus, if bank A has total bank reserves of 100 and bank B of 200, the ECB could tell these banks that, say, 20% of these bank reserves are unremunerated MRRs. For bank A this would mean that 20 of their 100 of bank reserves would be MRR and unremunerated, and for bank B this would be 40. No amount of displacement of deposits to London, or elsewhere, would help these banks in reducing their unremunerated MRRs.

### **Heterogeneity of the banking sector**

It has been noted by some observers (Deuber and Zobl 2023, Kwapił 2023, and Standard & Poors 2023) that the use

of a two-tier system of reserve requirements in an environment of heterogeneity of the banking sector could create liquidity problems for some banks that have relatively few bank reserves.

These would be forced to borrow funds in the interbank market to satisfy the minimum reserves. In this connection, these observers have pointed at Italian banks that could face liquidity difficulties.

We do not think there would be a systemic problem under reasonable MRRs. We show the evidence in Table 2. This presents the minimum required reserves (that today are 1% of outstanding deposits) as a percent of the total reserves of the euro area banks. We observe indeed heterogeneity in the distribution of bank reserves across countries in the euro area.

If the MRR were to be raised from 1% to 10% (quite a large increase) all euro area countries (except Malta) should have enough reserves to satisfy the MRR while maintaining some excess reserves.

Take the case of Italy. In 2022, these minimum reserves represented 9.2% of total bank reserves of Italian banks. If the MRRs of outstanding deposits were raised to, say 5%, this would imply that these minimum reserves would represent 46% of the total reserves of Italian banks. The Italian banks would still have 54% of their bank reserves as excess reserves.

Hence, we can conclude that as long as the MRRs remain below 10% of outstanding deposits Italian banks would have enough reserves to satisfy these minimum requirements. As long as there are excess reserves in the system as a whole, borrowing liquidity by a few banks to satisfy MRRs does not create a systemic issue.

But if it turned out that significant numbers of banks (in Italy or elsewhere) were to experience serious liquidity problems to satisfy MRRs, the ECB could define these MRRs on an asset base as defined in the previous section.

**Table 2. Minimum required reserves as percent of total reserves (at 2022 level)**

Country	(MRR=1%)	(MRR=5%)	(MRR=10%)
Austria	5.6%	28.0%	56.0%
Belgium	3.3%	16.5%	33.0%
Cyprus	2.9%	14.5%	29.0%
Germany	5.6%	28.0%	56.0%
Estonia	6.6%	33.0%	66.0%
Spain	7.5%	37.5%	75.0%
Finland	3.4%	17.0%	34.0%
France	4.7%	23.5%	47.0%
Greece	5.7%	28.5%	57.0%
Ireland	5.5%	27.5%	55.0%
Italy	9.2%	46.0%	92.0%
Lithuania	8.8%	44.0%	88.0%
Luxembourg	6.1%	30.5%	61.0%
Latvia	6.6%	33.0%	66.0%
Malta	14.9%	74.5%	149.0%
Netherlands	5.0%	25.0%	50.0%
Portugal	7.4%	37.0%	74.0%
Slovenia	5.3%	26.5%	53.0%
Slovakia	4.8%	24.0%	48.0%

Note: MRR is defined as the percent of deposits issued by banks that have to be held as required reserves at the respective central banks.

Source: ECB, Disaggregated financial statement of the Eurosystem. We use the reserve level of each national banking system in 2022 as the total reserve base.

In such an asset-based system, banks would be told to keep a given percent of their total bank reserves in the form of unremunerated minimum reserves. All banks would be able to satisfy such a requirement without encountering liquidity problems. An asset-based system would solve both the foot-loose and the heterogeneity problems.

### **Minimum reserve requirements and the transmission of monetary policies**

Clearly, the use of unremunerated minimum reserve requirements will influence the transmission of monetary policies. The question is in which direction this influence goes.

Prima facie, one would expect that adding an increase of unremunerated MRRs to an interest rate hike to fight inflation would strengthen the effectiveness of such a policy compared to a policy of just increasing the interest rate. But that is not how some observers see this (eg. Kwapil 2023).

These observers note that an increase in unremunerated MRRs (now 1% in the Eurosystem) could weaken the transmission of monetary policies. The reasoning is as follows. A higher unremunerated MRR raises the margin between loan and deposit rates, leading banks to raise the loan rates and to lower the deposit rates.

The former strengthens the monetary transmission towards a reduction of inflation; the latter does the opposite as it leads agents to save less. If the latter effect is larger than the former, unremunerated MRRs may reduce the effectiveness of monetary policy in the fight against inflation.

This analysis has led to a perception that the use of the unremunerated MRRs has ambiguous effects on the transmission of monetary policies, which in turn has led policymakers to be cautious about the use of unremunerated MRRs.

In a letter to the European Parliament, Christine Lagarde, President of the ECB, cautioned the parliamentarians against the use of unremunerated MRRs (Lagarde 2023) and wrote: "*Limiting the remuneration on reserves held in the deposit facility could thus affect the effective transmission of the monetary policy stance*," without specifying whether the monetary policy stance would be reinforced or weakened by the use of unremunerated MRRs. The president of the ECB promised to study the issue.

In fact, there is little ambiguity about how unremunerated MMRs affects the transmission of monetary policies, for at least two reasons. First, if a raise in the unremunerated MRR leads to a decline in the deposit rate, its (positive) effect on aggregate demand is likely to be small compared to the (negative) aggregate demand effect of an increase in the loan rate.

Low-liquidity households, typically borrowers, suffer from two effects following an increase in the loan rate. The first is a direct (substitution) effect: a higher interest rate leads them to borrow less. The second is a debt burden effect: an interest rate increase raises their debt burden, which also leads them to reduce their borrowing.

Both effects reinforce themselves and lead to a negative effect on aggregate demand. The situation is different on the deposit side. For high-liquidity households, typically creditors, there are also two effects.

The decline in the deposit rate leads to a direct (substitution) effect, inducing these creditors to reduce their deposit holdings and to spend more. But at the same time there is an income effect working in the other direction: these creditors experience a decline in disposable income leading them to consume less.

Both effects work in opposite direction, weakening the potential positive aggregate demand effect of the deposit channel (Holm *et al* 2021) who analyse this more formally). We conclude that the increase in the loan rate and the decline in the deposit rate induced by an increase in unremunerated MRRs is likely to reduce aggregate demand.

Second, when the central banks raise the interest rate while remunerating bank reserves, they increase the transfers to banks, thereby increasing bank profits and improving the banks' equity position. With a higher equity ratio, banks will be more willing to supply loans to households and firms. (For an analysis of this 'equity effect' on bank loans see Shin 2015, Gambacorta and Shin 2016, Vanden Heuvel 2002).

As a result, the expected negative effect of a rate hike on loans is (partly) offset by the positive equity effect on bank loans when bank reserves are remunerated. The transmission mechanism is made less effective, ie. increases in the policy rate have a lower effect on the loan supply and ultimately on inflation.

Conversely, by not remunerating bank reserves, this 'perverse' equity effect is eliminated, and the monetary transmission mechanism is made more effective. This theory has been confirmed empirically by Frick *et al* (2023) and De Grauwe and Ji (2024), leading to the conclusion that the use of unremunerated MRRs increases the effectiveness of monetary policies to fight inflation.

### **Conclusion**

The EU struggles to find funding for Ukraine, for the energy transition, and for compensating farmers who are hit by the need to change farming to reduce global warming. The EU spends about €50 billion on Ukraine (2024-27) and €50 billion a year on the farmers. Lots of conditionality is imposed on recipients of these funds.

In the meantime, the bankers in the euro area now receive €140 billion in one year, no strings attached. It is surprising that this extraordinary priority given to bankers over farmers and Ukraine remains relatively unnoticed both in political circles and in the media.

It is equally surprising to find economists who defend the large transfers to bankers with the argument that the bankers are entitled to these transfers, and that taking away, even only a fraction, would be unfair.

A two-tier system of reserve requirements proposed in De Grauwe and Ji (2023, 2024) reduces these transfers and makes the fight against inflation both fairer and more effective. We have addressed the different points of criticism regarding this proposal in this column.

Some of these criticisms make more sense than others, but all can be overcome relatively easily. The obstacles to implementing our proposal, or other proposals that aim at fighting inflation more fairly, are not technical. They have to do with vested interests and the political power these exert. ■

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# Unresolved business



Lucio Vinhas de Souza examines the institutional and financial implications of past and future EU enlargements and argues that the progress made towards Ukrainian accession has direct implications for the other candidate countries of Moldova and Georgia

**O**n 1 February 2024 the EU finished another Summit that had Ukraine, and its future relations with the EU, as one of its main topics. This meeting was in effect a continuation of the enlargement-related discussions of the previous Summit in December 2023, and had implications for other countries aiming for EU membership amidst the geopolitical storms battering the European continent, namely, on the financing side of this complex process.

Moldova and Ukraine applied for EU membership in February 2022. After a favourable opinion by the European Commission, and approval by the European Council, they were granted EU candidate status in June 2022 and, in December 2023, the European Council decided to open negotiations for EU accession with both.

Georgia, on the other hand, applied for EU membership in March 2022 and was granted candidate status in December 2023, on the understanding that it takes the relevant steps as set out in a Commission recommendation (therefore, accession negotiations have not yet been opened with that country)<sup>1</sup>.

For both Moldova and Ukraine, the process so far has been speedy (by EU enlargement standards), and historically unique as it involves one country that is under an open military conflict with a belligerent Russia and has part of its territory occupied by military forces of that country (Kappner *et al* 2022), and another that is under severe and continued pressure (albeit short of open military conflict) from that same belligerent power.

Therefore, beyond the traditional promise of economic development normally associated with EU membership (often referred to as an economic ‘convergence machine’; see Ridao-Cano and Bodewig 2018), it also carries for those countries the promise of shelter from those pressures, and even of national survival (given the ‘mutual defence’ clause in Article 42(7) of the Treaty on European Union, which states that if an EU member state is the victim of armed aggression on its territory, the other member states have an obligation to aid and assist it by all means in their power).

## Previous enlargements

'Enlargement' is the expression used for the situation in which new countries 'accede' to the EU, ie. become an EU member state. The EU has so far had seven enlargements: the first took place in 1973, and led to the accession of Denmark, Ireland, and the UK (the UK would leave the EU in 2020); in 1981 Greece became a member; in 1986 it was Portugal and Spain's turn; in 1995 Austria, Finland, and Sweden entered the EU; the fifth enlargement happened in 2004 and saw ten countries – Cyprus, Czechia, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia, and Slovenia – join the EU at the same time; in 2007 Bulgaria and Romania became members; and Croatia joined in 2013.

*The journey ahead for these countries is likely to be complex and long, with inevitable broader discussions about the governance of an eventually even larger and more heterogeneous EU at some point in the near future*

The scale of each of these enlargements as a share of the GDP and of the population of the EU is shown in Figure 1 (the shares are a ratio of the EU totals for the year before accession), as is the potential accession of Georgia, Moldova, and Ukraine. Importantly, the EU as a whole and its Member States – old and new – benefit from all those enlargements (eg. European Commission 2009).

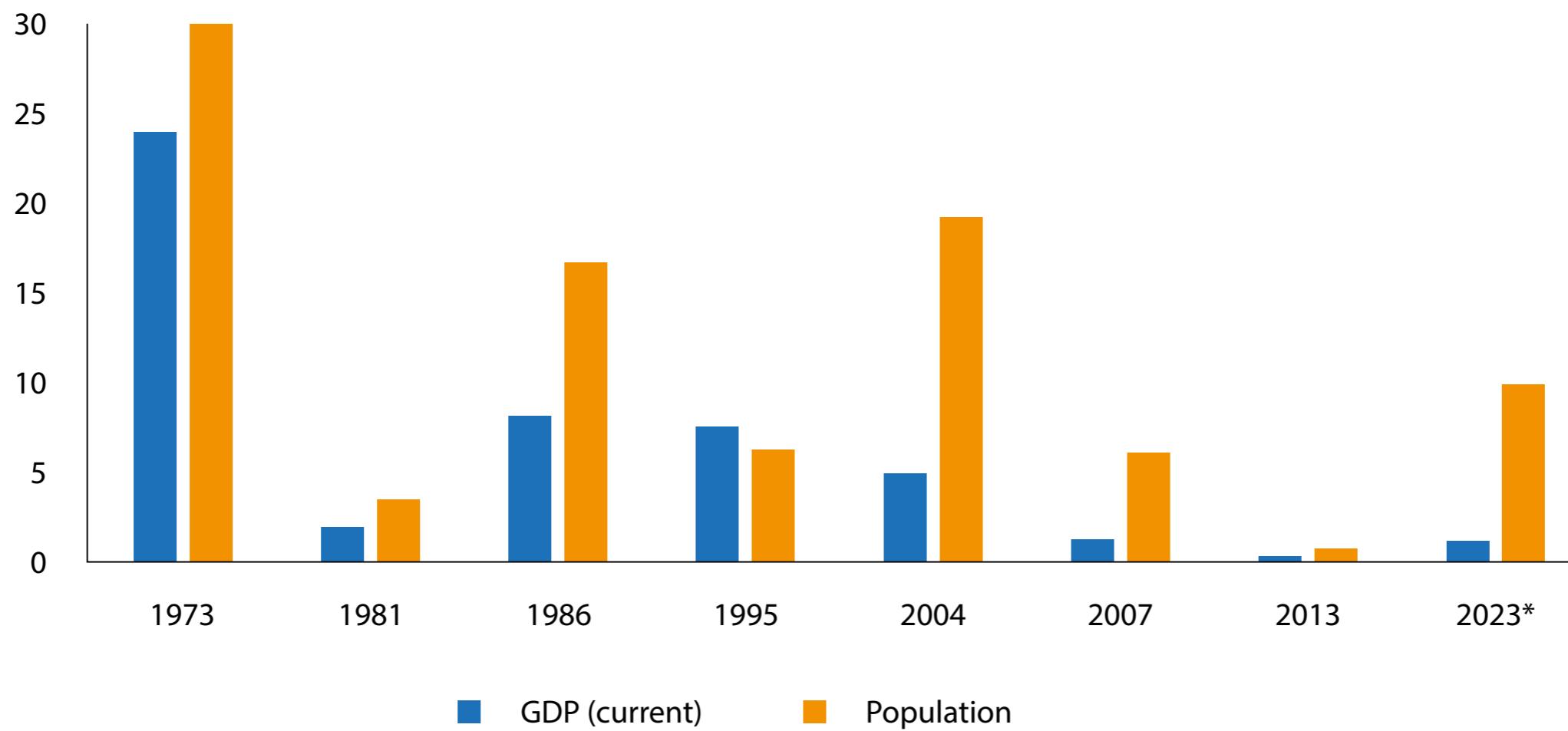
As one can see in Figure 1, the largest enlargement both as a share of the EU's GDP and population was actually the first one in 1973, which reflects the small number of initial EU member states and the large relative importance of the UK: the EU's population increased by almost quarter, and its GDP by 30%.

The second largest, GDP-wise, was the joint Iberian accession of Portugal and Spain in 1986, which increased the EU's previous GDP by around 8%; in terms of population, the 2004 'big bang' enlargement towards Central Europe, which increased the EU's population by around 19%, was the second largest. An enlargement to Georgia, Moldova, and Ukraine would be the fourth largest in terms of population, and the sixth largest in terms of GDP.

Enlargements directly affect the governance mechanisms of the EU, as around 20% of the votes on the European Council (the main decision-making body of the EU) follow an unanimity process, where any single member state can block decisions. Unanimity is used in some key policy areas, from security and defence to taxation and EU finances, and enlargement itself.

However, the population size of new EU member states also matters for EU governance in two ways: via voting on the European Council and via representation in the European Parliament (which shares with the European Council the power to adopt and amend legislative proposals, and also approves the EU budget).

**Figure 1. How large where enlargements in relation to the EU?**



Note: \*Data for 2023 uses the IMF estimated GDPs for 2023 and the 2022 populations.

Source: Author, using IMF and World Bank data.

About 80% of votes in the European Council use a ‘qualified majority voting’ (QMV) process, where a qualified majority is reached if two conditions are simultaneously met: (1) 55% of member states vote in favour, and (2) the proposal is supported by member states representing at least 65% of the total EU population.

As for the European Parliament, its seats (capped at a maximum of 750) are allocated using as a reference the population of the EU member state, but under a ‘degressive proportionality’ scheme that gives more seats per capita go to less populous member states<sup>2</sup>.

The GDP of new EU member states also matters, not necessarily or only in and of itself, but rather in terms of the EU’s financing and redistribution mechanisms: the EU has many and significant mechanisms of unilateral transfers, of a sectoral nature (think of the Common Agricultural Policy) and of a ‘cohesion’ nature (which is EU lingo for transfers to member states and regions with, roughly, a GDP per capita<sup>3</sup> below the EU average, to help them converge to this average).

Those transfers are mainly financed by a subset of EU member states that are *net payers* to the EU budget (as all EU member states do pay towards the common EU budget). The upshot of this is that of the enlargement waves, only the first and the fourth ones – in 1973 and 1995 – involved *net payers*<sup>4</sup>, while all the other enlargements involved *net recipient* countries.

As the numerical balance now favours net recipient member states, the transfers component of the EU budget has increased. Also, enlargement towards member states with lower GDP per capita than *existing* EU member states effectively implies that current net recipients will either receive relatively less transfers or even become net payers<sup>5</sup>; this outcome is enhanced if the new member state has a relatively large agricultural sector.

There are several *indicative* estimates of the potential financial costs of a next enlargement wave, mostly concentrating on Ukraine (eg. Emerson 2023, Lindner *et al* 2023). These estimates, fluctuating between €10–20 billion *net per year*<sup>6</sup> (with CAP-related costs for Ukraine being a major item), are highly uncertain, but suggest seemingly manageable figures, even before any considerations about likely adjustments to those policies.

However, these estimates abstain from including the amounts that will be necessary for the prolonged post-war reconstruction needs of Ukraine, which, although also highly uncertainty, are likely to be very significant (World Bank *et al* 2023), which is acknowledged by the proposed 'Ukraine Facility'.

This country-specific facility would pool the EU's reconstruction and accession-related budget support for Ukraine into one single instrument, and would be structured into three pillars:

**Pillar I:** The government of Ukraine will prepare a 'Ukraine Plan', setting out its intentions for the recovery, reconstruction, and modernisation of the country and the reforms it plans to undertake as part of its EU accession process. Financial support in the form of grants and loans to the state of Ukraine would be provided based on the implementation of the Ukraine Plan, which would be underpinned by a set of conditionalities and a timeline for disbursements.

**Pillar II:** Under the Ukraine Investment Framework, the EU will provide support in the form of budgetary guarantees and a blend of grants and loans from public and private institutions to cover the risks of loans and other forms of funding.

**Pillar III:** Technical assistance and other supporting measures helping Ukraine align with EU laws and carrying out accession-related structural reforms.

The initial European Commission proposal was for a €50 billion facility, €17 billion in grants, and €33 billion in loans, and that was the main leftover from the December 2023 Summit. Beyond aiming to a medium-term stable funding mechanism to Ukraine, it also aims to partially separate the funding of Ukraine-related expenditures from those related to other EU accession countries. This was the ‘unresolved business’ from December 2023.

### **So, onwards to the next enlargements?**

The period elapsed since the last enlargements in 2013 is the longest one since enlargements began in 1973. The underlying process is in itself usually a long one, with lags between application and accession easily a decade long (for instant, Portugal applied for EU membership in 1977, while the ten Central European countries that acceded to the EU between 2004 and 2007 lodged their applications between 1994 and 1996).

That is because the process is rather complex. The accession negotiations prepare the candidate for eventual membership, focusing on the adoption of the whole body of EU laws and regulations (the *Acquis communautaire*, currently estimated at 110,000 pages) and the related implementation of all the needed judicial, administrative, and economic reforms<sup>7</sup>.

Only when negotiations on all policy areas are completed, and the EU itself is prepared for enlargement in terms of ‘absorption capacity’ (an ill-defined concept), is an accession treaty prepared. This document still needs the European Parliament’s consent and the European Council’s *unanimous approval* before all EU member states and the candidate country can sign it. Only then doe the candidate become an EU member state.

So, the journey ahead for these countries is likely to be complex and long (for how long it has already been, see Vinhas de Souza *et al* 2006), with inevitable broader discussions about the governance of an eventually even larger and more heterogenous EU at some point in the near future.

That said, the immediate hurdle left from the EU Council Summit of December 2023 was addressed by the decisions of the Special Summit of 1 February 2024 (European Council 2024), namely, the 2024–2027 financing of the (pre-accession) reconstruction of Ukraine via the Ukraine Facility, integrated into discussions of the mid-term review of the EU budget (known as the Multiannual Financial Framework, or MFF).

This outcome has direct – and positive – implications for the other candidate countries. And the geostrategic imperative for another EU enlargement could not be clearer. So, this journey will continue. Fare thee well. ■

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## Endnotes

1. This column will not address the situation of the Western Balkans countries that are applying for EU membership, nor that of Türkiye.
2. Poland, a country with a similar population to Ukraine, will have 52 seats in the European Parliament in the 2024 elections; Croatia, a country with a population similar to Georgia, has 12 seats; and Lithuania, a country with a similar population to Moldova, will have 11 seats.
3. More precisely, a per capita gross national income (GNI), which is GDP plus income from abroad, below 90% of the EU's average to qualify to receive 'cohesion' funds.
4. Ireland is now also a net payer to the EU budget.
5. As the 'cohesion' inherent logic implies supporting the economic development of a member state, that is the eventual end state in any case.
6. The upper figure also includes the costs of integrating the Western Balkans countries into the EU.
7. In early 2020 the EU approved a "revised enlargement methodology", with a stronger focus on fundamental reforms and political steering, incorporating positive and negative conditionalities and the possibility of reversibility of the process in case of backsliding or non-satisfactory performance by the acceding country.

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*Author’s note: This column does not necessarily reflect the view of any organisation to which the author is or was linked. This article was originally published on VoxEU.org.*

# To become a geopolitical player the EU needs treaty change

Marek Dabrowski argues that the European Union will never become a serious geopolitical player without reducing national veto power

**T**he European Union's goal of being more 'geopolitical', first declared by then European Commission President-elect Ursula von der Leyen in [November 2019](#) and repeated several times since, remains [far from being fulfilled](#). EU support for Ukraine is the best, though not the only, example of this failure.

Russia's aggression in Ukraine has become the most serious challenge to European security and stability since the Second World War. Initially, there was a robust consensus among European Union countries that the victim of aggression should be supported, though countries offered different magnitudes and forms of support.

Unfortunately, this consensus began to erode in 2023 under the pressure of various business lobbies. It started with disputes around [imports of Ukrainian grain](#) to EU frontier states. From mid-November 2023, Polish transportation firms started [blockading](#) the Polish-Ukrainian border, demanding the reintroduction of licences for Ukrainian truckers.

However, these were relatively minor conflicts compared to the failure of EU member-state governments to approve inclusion of a €50 billion [Ukrainian Facility package](#) in the EU's 2021-2027 budget, the Multiannual Financial Framework (MFF). The proposed package was seen as the continuation of the [EU financial support](#) for Ukraine granted in 2022-2023.

Hungary's prime minister, Victor Orban, blocked the plan, which required unanimity of member-state governments. A parallel decision to open EU accession negotiations with Ukraine could be adopted only after Orban abstained (for not blocking the decision, he managed to extract a [substantial financial concession](#) from the European Commission).

On 1 February 2024, EU countries will try again to approve MFF changes. There are two possible plan Bs to overcome the Hungarian veto. First, a dedicated aid fund could be created by the other 26 member states via an intergovernmental treaty. A second solution, suggested by the Hungarian government, would be splitting of the €50 billion package into **four annual tranches**. Releasing each tranche would require a unanimous decision of member states.

*The requirement for unanimity should be replaced, at least partly, by qualified majority voting at least in three policy areas*

Both variants are worse than the initial proposal. Establishing a separate, formally off-EU, fund will require financial contributions from member states and ratification procedures in national parliaments. Splitting a package into tranches will provide Hungary and potentially other EU countries with opportunities for political bargaining over releasing each portion of financial aid. Both options would signal the EU's decision-making difficulties in supporting Ukraine.

Difficulties in providing EU financial aid to Ukraine come at a critical moment in its almost two-year struggle against aggression. The war has exhausted the country's material and human resources; the damage toll increases every day. The EU's failure to approve the aid package coincides with similar difficulties in the US Congress.

As a result, the support from the two critical Ukrainian allies has become bogged down. On the other hand, the financial aid provided in the second half of 2022 and 2023 [helped ensure](#) the Ukrainian economy's relative macroeconomic stability and moderate recovery.

What should EU countries do to deliver on the aid promise for Ukraine and avoid similar failures in the future? In the short term, the only way is an intra-EU diplomatic effort, even at the cost of bad compromises.

However, in the long term, this and other similar past experiences (for example, the failure for almost 15 years to open EU accession negotiations with North Macedonia) underline the necessity of changing the EU's decision-making mechanism.

The requirement for unanimity should be replaced, at least partly, by qualified majority voting at least in three policy areas: common foreign and security policy, EU enlargement and the MFF.

There are two ways to achieve this goal: activating the passerelle (bridging) clauses in the EU Treaties – which allow qualified majority voting in certain policy areas on the basis of a unanimous decision of the European Council – or changing the Treaties.

The first is politically and legally more accessible but limited in scope. For example, it [cannot apply](#) to enlargement decisions. Regarding the second avenue, the [resolution](#) of the European Parliament of 22 November 2023, containing 245 proposed Treaty amendments, many of them reducing national veto powers, should serve as the starting point for negotiating Treaty change.

Moving away from unanimity, though politically challenging, would be a critical step to strengthen the role of the EU as a geopolitical actor and to [enable future EU enlargement](#). ■

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# Decisions ahead and takeaways for the EU

Alicia García-Herrero argues the EU should try to attract more business from Taiwan, though Taiwan's January 2024 election hasn't made the job easier



**T**aiwan's economy has transformed since 2016 under the leadership of the Democratic Progressive Party (DPP). In particular, the Taiwanese economy has diversified away from mainland China, while reliance on semiconductors is now even more acute than eight years ago.

In elections in January, the DPP won the presidency for a third term but lost overall control of Taiwan's parliament, the Legislative Yuan. In contrast to the previous two terms, the DPP therefore needs to agree policy, including economic policy, with other parties. This could signal a softer approach in relation to the continuation of diversification away from the mainland.

### **Ongoing diversification**

Mainland China remains Taiwan's biggest export and investment destination, despite the share of Taiwan's exports that go to China reducing from 40 percent on average between 2016 and 2019 to 35 percent in 2023 (Figure 1).

This has happened even though Taiwan signed a free trade agreement with mainland China in 2010 – the Economic Cooperation Framework Agreement (ECFA) – which at the time led to an increase in Taiwanese exports to the mainland. The COVID-19 pandemic in 2020 also triggered a sharp increase as the rest of the world entered a deep recession, but the trend has not lasted.

Since 2021, the share of Taiwanese exports going to the mainland has dropped significantly, influenced by US export controls on high-end semiconductors, with a clear knock-on effect on Taiwanese exporters.

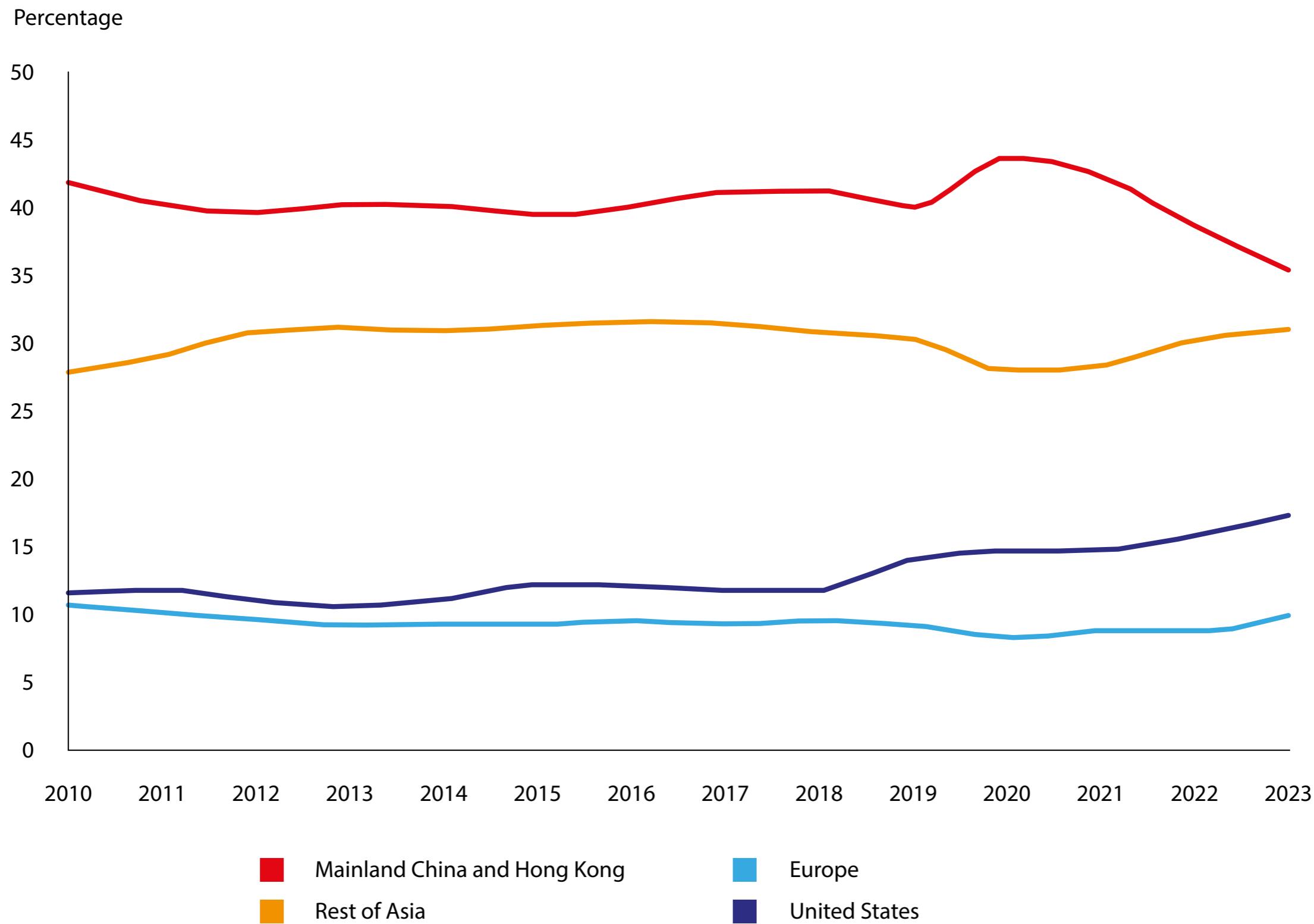
Taiwanese FDI into mainland China has also shrunk rapidly, from 65 percent of total Taiwanese FDI on average from 2008-2016 to 34 percent on average from 2017-2023 (Figure 2). The difference between these periods is that in the

former, Taiwan was governed by the Kuomintang (KMT, Chinese Nationalist Party), which favours closer relations with the mainland, while in the latter period the DPP was in charge.

There are both geopolitical and economic reasons for mainland China's falling share of Taiwanese FDI. First, the ECFA trade and investment agreement, reached under the first term of KMT President Ma Ying-jeou, was not extended when a new round of negotiations started in 2012, to include technological cooperation, finance and people-to-people exchanges.

*Working with business associations and chambers should be a key driving force to improve business relations between Taiwan and the EU, especially considering that the EU is the largest foreign direct investor in Taiwan*

## Figure 1. Taiwan's exports – destinations by % of value



Source: Bruegel based on Taiwan Ministry of Finance, CEIC.

EQ Europe Quarterly ■ Spring 2024

A broader economic agreement between Taiwan and the mainland, mostly focusing on services – the Cross-Strait Service Trade Agreement (CSSTA) – fell victim to lack of consensus among Taiwan’s main political parties, increased tensions in the Taiwan Straits and student protests in Taiwan (the so-called Sunflower movement) in 2014<sup>1</sup>.

Second, with the DPP victory in 2016, the new Southbound Policy<sup>2</sup> was launched, offering incentives for Taiwanese companies investing in 18 Asian countries, including ASEAN<sup>3</sup>, India and other South Asian and Australasian nations.

In addition, rising labour costs in mainland China, the ongoing trade war between the US and China, an increased regulatory burden in the mainland and political tensions between the two sides of the Taiwan Strait also pushed Taiwanese businesses to look elsewhere to invest.

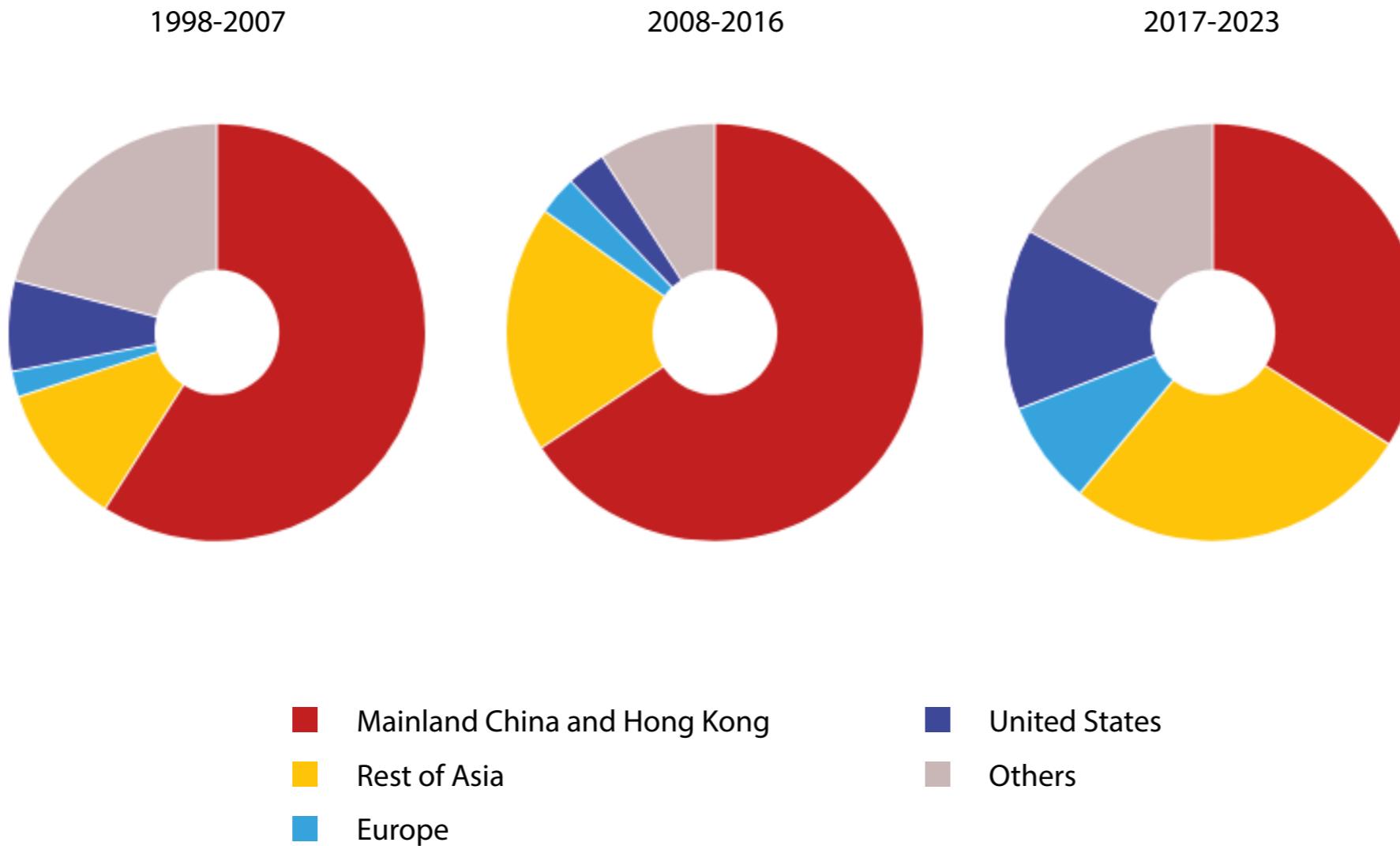
### **The new political reality and geographical diversification**

While the election winning DPP wants to see further diversification away from the mainland, the more pro-China party, the KMT, wants reinforced economic relations with China<sup>4</sup>. Because of the now-hung parliament, the DPP will need to take some of the KMT’s wishes into account it wants pass new rules, including those related to geographical diversification.

Beyond the two parties’ preferences, two other important issues also need to be factored in. First, geographical diversification requires open markets but Taiwan is increasingly unable to open any market through trade or investment deals.

Taiwan has spent the last eight years negotiating bilateral deals with its closest allies, Japan and the US, but the DPP administration has not even been able to complete these. Incoming President Lai has said that Taiwan should

**Figure 2. Taiwanese outward direct investment, destinations by % of value**



Source: Bruegel based on Taiwan Ministry of Economic Affairs, CEIC.

continue to push to be part of the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP), to which it applied in September 2021, but the reality is that Taiwan's application has little hope of success.

China officially applied to be a member of the CPTPP only a couple of days before Taiwan. Since then, the United Kingdom has become a member of CPTPP, but the negotiation processes with Taiwan and mainland China have not started. Australian's prime minister, Anthony Albanese, has expressed severe doubts about Taiwan's ability to become member of CPTPP because of lack of international recognition of it as a nation-state<sup>5</sup>.

Second, while the DPP is likely to continue to offer more fiscal incentives to promote diversification in Southeast Asia and India (under the Southbound Policy), the fastest-growing destination for both exports and foreign direct investment from Taiwan is the United States, followed by Japan.

This can be explained by the ongoing artificial intelligence revolution, which needs semiconductors, and the decisions of some key Taiwanese chip companies (especially TSCM) to open factories overseas for chip production, with the US and Japan as the most important destinations.

In other words, the DPP's push for geographical diversification might not be the main reason why diversification has happened; rather, it has been driven by market forces and business opportunities. This also means that the KMT push to maintain – if not deepen – economic ties with mainland China might not succeed unless China's currently underwhelming economic performance turns around.

### **Implications for the European Union**

So far, the EU has benefitted little from Taiwan's trade and investment diversification, at least when compared to the US and the rest of Asia. The EU's export share into Taiwan has remained practically stagnant (while the US has

doubled its share), notwithstanding a large increase in exports from the Netherlands for a single item – ASML’s lithography machines for chip production.

The EU lacks a trade or investment deal with Taiwan, but so do some of Taiwan’s other trading partners, including the US. Considering that the EU is the largest foreign direct investor in Taiwan, the question arises of whether the EU should do more to foster more bilateral economic relations.

The gains could be substantial, especially from inbound FDI as Taiwanese investment focuses on high-end manufacturing. There has been some movement. A €5 billion investment in France by a Taiwanese company (ProLogium) was announced in May 2023 to build a battery factory<sup>6</sup>. TSMC announced in August 2023 a €4.5 billion investment in a semiconductor factory in Germany<sup>7</sup>.

But for the EU to catch up with Japan and the US as a recipient of outbound FDI from Taiwan, the result of Taiwan’s elections could be an obstacle. This is because the DPP will have less control of the economic agenda because it does not control the Legislative Yuan.

The close-to-impossible negotiation of a trade and investment deal between the EU and Taiwan – as shown by Taiwan’s difficulties in relation to Japan, the US and the CPTTP – does not point to any improvement in the institutional framework for economic relations to improve.

The question, then, is what can the EU offer to attract high-end foreign direct investment from Taiwan? Subsidies to attract semiconductor factories cannot be the only answer, given the very large amounts needed and the pressure such subsidies put on EU member states’ already stretched finances (Legarda and Vasselier, 2023).

Working with business associations and chambers should be a key driving force to improve business relations between Taiwan and the EU, especially considering that the EU is the largest foreign direct investor in Taiwan, while Taiwanese companies have been absent from the EU single market until recently.

Overall, the US and the rest of Asia have been the main winners from Taiwan's rapid diversification of its economy away from mainland China. The EU, which is lagging, should work to enhance its economic exchanges with Taiwan. Hopefully the January 2024 election results will facilitate this. Most importantly, the EU should aim to attract more high-tech FDI from Taiwan.

Unfortunately, a better institutional framework through a trade/investment deal seems highly unlikely, for geopolitical reasons. This puts all the burden on chambers of commerce and other forums to improve business relations. ■

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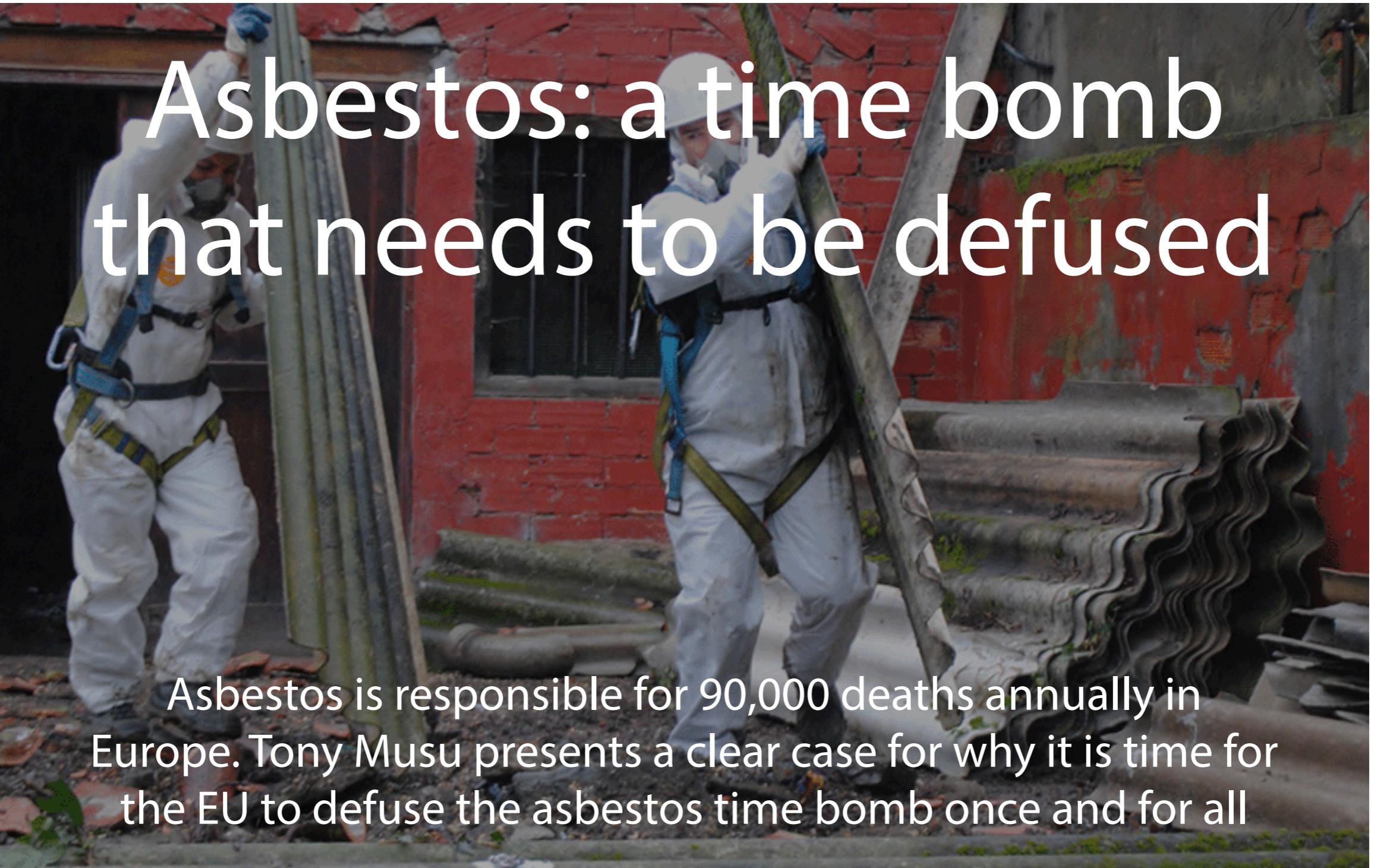
## Endnotes

1. *The Sunflower Movement was a student-led protest that occupied Taiwan's Legislative Yuan to put pressure on the KMT government against signing a second cooperation deal with mainland China. See Ho (2018).*
2. *See the New Southbound Policy portal at <https://nspp.mofa.gov.tw/nsppe/>.*
3. *Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand and Vietnam.*
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Asbestos is responsible for 90,000 deaths annually in Europe. Tony Musu presents a clear case for why it is time for the EU to defuse the asbestos time bomb once and for all

**A**sbestos has been banned in the European Union since 2005, but this carcinogen is still present in millions of buildings across Europe, and it poses a major threat to the health of workers and the population at large. The former are particularly exposed when they work on or in buildings containing asbestos materials, and the risk only increases as these gradually deteriorate.

In the light of the climate crisis, the European Union recently embarked on a huge energy efficiency renovation plan for buildings. If we want to avoid a new wave of victims amongst future generations, the question of asbestos removal must be tackled head-on by European and national authorities.

It has been known for more than 100 years: asbestos is an extremely hazardous substance. Inhalation of asbestos fibres can cause asbestosis and various kinds of cancer, including mesothelioma, lung cancer, cancer of the larynx and ovarian cancer. The risks of contracting these diseases increase with the number of fibres inhaled, and there is no exposure level below which health is not adversely affected.

In most cases, the symptoms develop only after a long period of latency of 20 to 40 years – this is why experts say that asbestos is like a time bomb. The medical community has been aware of the detrimental effects of this substance since the start of the 20<sup>th</sup> century, when the first cases of asbestos-associated mortality were diagnosed and documented.

Despite this knowledge, asbestos continued to be used, largely because of the scandalous efforts made by the pro-asbestos lobby to downplay the risks associated with exposure and to prevent essential information from being published in scientific literature and in the popular press. Dishonest industrialists know very well that, as long as doubts persist, there will be no pressure from public opinion or legislation that could eat into their profits.

Asbestos use reached its peak after the Second World War, when it was employed in ever-increasing quantities in an ever-growing number of products in industry and construction.

Its low production costs and its sought-after chemical and physical properties (high tensile strength, resistance to high temperatures, and electrical insulation) contributed to the rapid growth in its use in extremely varied

*It is estimated that between two and four million people have died in the EU since WWII after being exposed to asbestos, the great majority of whom were asbestos workers*

applications: thermal insulation (for pipes and boilers); in fire barriers and ceilings; for the electrical insulation of cables; in trains and ships; and for the manufacture of piping, gutters, chimney pipes, ventilation ducts, garden furniture, planters, decorative items, and so on, in asbestos cement.

It is estimated that between two and four million people have died in the EU since WWII after being exposed to asbestos, the great majority of whom were asbestos workers<sup>1</sup>.

### **Four waves of victims**

A number of epidemiological ‘waves’ of human exposure to asbestos in Europe can be identified (see Figure 1). The first wave consists of miners and asbestos industry workers. The second wave is made up of carpenters, plumbers, electricians, motor mechanics and other people who have worked with asbestos-containing materials.

The third wave comprises all the workers involved in repairs, renovations and asbestos removal. The EU will experience a fourth wave of people exposed to asbestos deteriorating over time in the buildings where, or close to where, they work or live.

Because of the very long period of latency between exposure and appearance of asbestos-related diseases, these various waves overlap. And as the exposure history of most asbestos victims has not been recorded, it is difficult to estimate the number of deaths associated with each wave.

In practice, asbestos production in Europe ended after 1985 thanks to the introduction of the first restrictions in national and European legislation, and so we can judge that the asbestos-related cancers that we are seeing today are probably mainly the result of the more recent third wave of exposure, in combination with the very end of the first wave and the waning of the second.

**Figure 1. The four waves of asbestos exposure**



Source: Adapted from DOI: 10.3390/ijerph19074031

We are also beginning to see the consequences of the fourth wave of exposure, evidenced by the increasing incidence of mesothelioma (a cancer almost exclusively caused by asbestos exposure) in patients without a history of occupational exposure.

The manufacture, marketing and use of asbestos was completely banned in the EU in 2005, and considerably earlier in some member states, yet the number of deaths from diseases associated with asbestos is not falling. Lung cancer and mesothelioma caused by asbestos continue to kill around 90,000 people each year in the EU (see Table 1), and mortality will go on increasing for at least one or two decades.

As a reminder, up to 78% of occupational cancers recognised in the member states are associated with asbestos. Moreover, occupational cancers are avoidable and their cost in the EU amounts to between €270 and €610 billion a year, or 1.8% to 4.1% of the EU's GDP<sup>2</sup>.

### **The EU Green Deal and asbestos: risk or opportunity?**

More than 220 million building units were constructed in the EU before the total ban on asbestos came into effect, so a large proportion of the current building stock still contains this carcinogen.

As a result of the climate crisis, the EU has committed itself to ambitious policies to reduce its greenhouse gas emissions. With the adoption of the European Green Deal and the Renovation Wave for Europe strategy, millions of buildings are expected to be overhauled, renovated or demolished. The European Commission's objective is to double the annual rate of energy efficiency renovations by 2030.

It must be mentioned, though, that in the construction sector alone, there are already between 4.1 and 7.3 million workers exposed to asbestos. This number is set to increase by 4% a year over the next 10 years<sup>3</sup>.

**Table 1. Occupational cancer deaths due to asbestos, EU27, 2019**

Country	Occupational cancer deaths	Country	Occupational cancer deaths
Austria	1,929	Italy	10,348
Belgium	2,140	Latvia	403
Bulgaria	1,432	Lithuania	611
Croatia	744	Luxemburg	128
Cyprus	184	Malta	112
Czechia	2,349	Netherlands	3,979
Denmark	1,275	Poland	7,292
Estonia	297	Portugal	2,176
Finland	1,163	Romania	3,845
France	12,038	Slovakia	1,114
Germany	18,730	Slovenia	435
Greece	1,733	Spain	8,762
Hungary	1,999	Sweden	2,273
Ireland	1,029	Total	88,520

Source: Institute of Health Metrics and Evaluation, Global Burden of Disease and Injury, IHME/GBD, The Lancet Oct 2020, <https://vizhub.healthdata.org/gbd-compare/>.

The construction sector is the third largest sector in the EU, with 10% of its workers being crossborder workers, of which the self-employed make up a large part. The proportion of workers from low-pay countries on temporary postings is very high.

These workers, who are particularly vulnerable to infringements of health and safety standards, are often unaware of the dangers of this lethal fibre and, in most countries, there are no information campaigns, training or essential safety measures for them.

An entire generation of workers – mainly in the construction sector but in others too, such as firefighters and workers involved in waste processing and recycling – along with the general public, through environmental contamination, will therefore be subjected to an increased risk of exposure to asbestos fibres unless the necessary measures are introduced.

To put an end to the third and fourth waves of human exposure to asbestos and to ensure a fair and socially equitable transition in the construction sector, it is a matter of urgency to put a comprehensive strategy and ambitious legislation in place at EU level for the safe removal and disposal of all asbestos.

### **Amendments to EU legislation**

In September 2022, the European Commission published a Communication entitled *Working towards an asbestos-free future*<sup>4</sup> and a proposal to revise the Directive on the protection of workers from the risks related to exposure to asbestos at work<sup>5</sup>.

The purpose of this revision of the Asbestos at Work Directive is to reduce the occupational exposure limit (OEL), which is a minimum requirement in all member states that has remained unchanged since 2003. It would be reduced from 100,000 fibres/m<sup>3</sup> to 10,000 fibres/m<sup>3</sup>.

This reduction is clearly insufficient to provide proper protection for the health and safety of millions of exposed workers in Europe. The Netherlands adopted a national OEL of 2,000 fibres/m<sup>3</sup> back in 2017<sup>6</sup>, and the European Parliament, in a resolution adopted in 2021 and only recently in its report on the review of the Asbestos at Work Directive<sup>7</sup>, has called for the European limit value for asbestos to be reduced to 1,000 fibres/m<sup>3</sup>, 100 times lower than the current value. This far stricter limit value is also supported by the European trade unions and health professionals.

However, focusing solely on the limit value is far too narrow an approach to address the enormity of the asbestos challenge. The European Parliament has taken the right track. As well as a more protective OEL, it is proposing other improvements to the text of the Directive: minimum training requirements for workers exposed to asbestos, certification of asbestos removal operators, deletion of the concepts of 'sporadic exposure' and 'low-intensity exposure' to asbestos – inappropriate for a carcinogen such as this, which has no threshold for adverse effects – and prioritising the removal of asbestos-containing materials rather than the use of alternative techniques that should be prohibited, such as encapsulation or sealing, and which only postpone the safe removal and disposal of asbestos.

Over and above the provisions of the Asbestos at Work Directive, many member states have already adopted other measures that help towards asbestos exposure prevention, such as mandatory screening for the presence of asbestos in buildings and the establishment of public inventories of buildings that contain it.

In its Communication *Working towards an asbestos-free future*, the European Commission announced a similar legislative initiative at Community level to improve available information on existing buildings still containing asbestos and asked member states to prepare national asbestos removal strategies.

It also anticipated introducing measures for improving the diagnosis and treatment of diseases caused by asbestos and safer management of asbestos waste. Lastly, it proposed major funding for member states to help them carry out all these measures.

The EU has the opportunity to defuse the asbestos time bomb once and for all. If it does not seize this chance now and leverage the potential synergies offered by the Green Deal, the Renovation Wave and the Recovery Plan for Europe (Next Generation EU), the deadly legacy of asbestos will be passed on to the next generations. ■

**Tony Musu is an ETUI Senior Researcher**

## *Endnotes*

1. *ETUI estimates.*
2. <https://www.etui.org/publications/reports/the-cost-of-occupational-cancer-in-the-eu-28>.
3. *Lassen C et al (2021) Study on collecting information on substances with the view to analyse health, socio-economic and environmental impacts in connection with possible amendments of Directive 98/24/EC (Chemical Agents) and Directive 2009/148/EC (Asbestos): final report for asbestos, Publications Office.* <https://data.europa.eu/doi/10.2767/981554>.
4. *EUR-Lex – 52022DC0488 – EN – EUR-Lex (europa.eu).*
5. *COM (2022) 489 final of 28 September 2022.*
6. *See the article by Pien Heuts in this issue.*
7. [https://www.europarl.europa.eu/doceo/document/A-9-2023-0160\\_EN.html](https://www.europarl.europa.eu/doceo/document/A-9-2023-0160_EN.html).

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# From laggard to leader?

Isabel Schnabel emphasises the euro area's strengths in social protection and environmental initiatives, and advocates measures to close the euro area's technology gap

**M**ore than 30 years after its inception, Economic and Monetary Union is widely seen as a success. It has steadily gained support among Europeans. Nearly 80% of euro area citizens support the single currency<sup>1</sup>. This is a strong vote of confidence, which shows that the euro is more than a currency. Our monetary union has become a global leader in social protection, a pioneer in fighting climate change and a guardian of free trade and democracy.

But these values and achievements are being increasingly questioned and challenged in a world that is becoming less open, less stable and less reliable<sup>2</sup>. To assert its role, the euro area needs to remain competitive; it must be capable of creating the sustainable growth that our social and economic fabric depends on.

However, this capability is increasingly under threat. At the turn of the millennium, Europe was operating at the global technological frontier, but today many euro area firms are laggards. Compared with many of their global peers, they invest less in both physical capital and research and development, and they are less productive.

I will explain the factors behind the euro area's competitiveness crisis and propose remedies to address its deeper root causes. I will argue that our most potent weapon for enabling European firms to catch up to the technological frontier is to eliminate the remaining barriers to the free movement of goods, services and capital in the European Union. European firms would then be able to compete and thrive in an environment of disruptive technological change where the 'winner takes most'.

### **Europe's lost IT revolution**

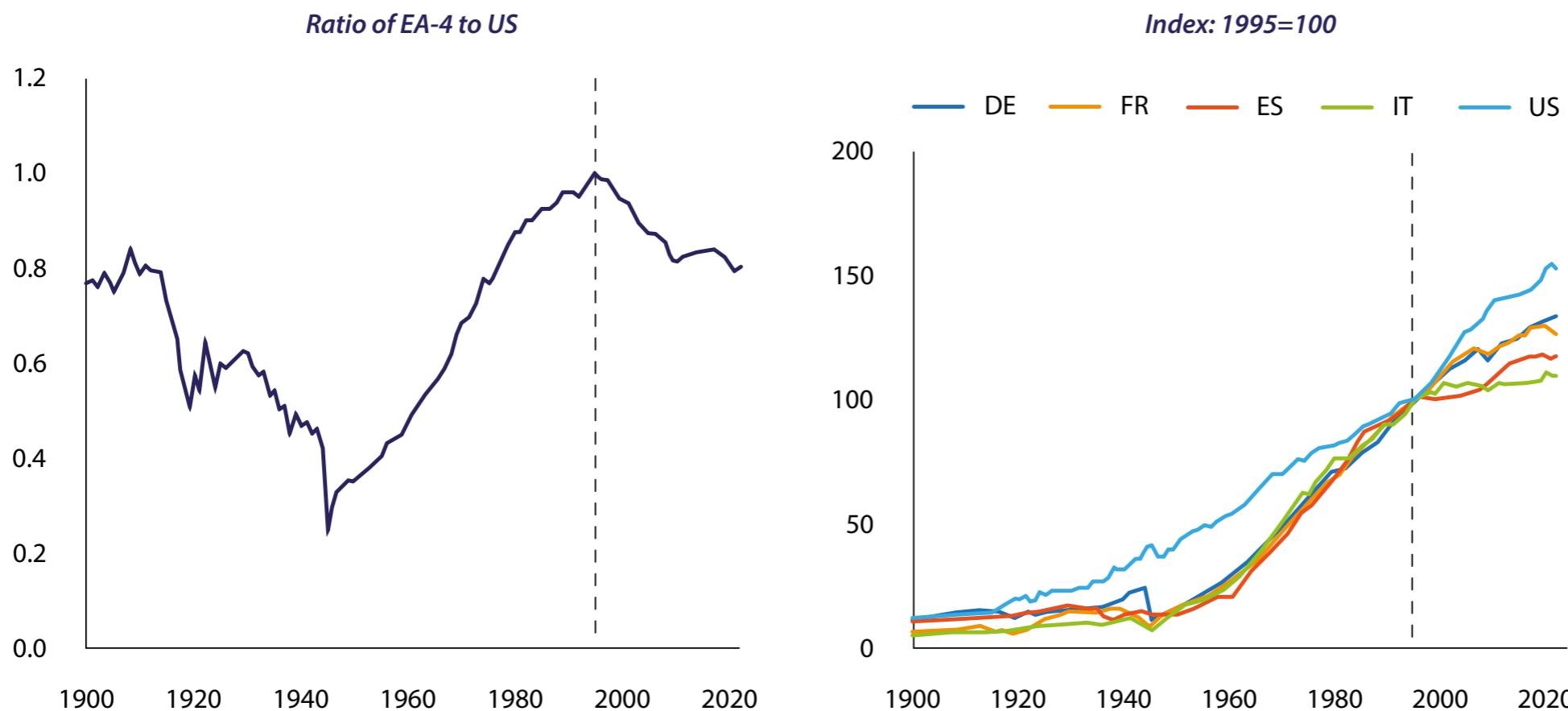
Europe looks back on a long history of innovation and fundamental transformation. In the 16<sup>th</sup> and 17<sup>th</sup> centuries, the discoveries of Nicolaus Copernicus and Isaac Newton marked watershed moments for social and scientific progress. In the 18<sup>th</sup> and 19<sup>th</sup> centuries, the rise of industrial Europe laid the foundations for modern society and the ensuing significant improvements in the standard of living.

After World War II, Europe once again became the world's engine of productivity growth. In the four largest economies in the euro area, the ratio of labour productivity compared with that of the United States increased rapidly, soaring from 25% in 1945 to 100% in 1995 and thereby closing the productivity gap with the United States (Slide 1, left-hand side)<sup>3</sup>.

*Growing economic nationalism, threats to our territorial security and a rising technology gap between ours and other advanced economies make the case for boosting the euro area's competitiveness ever more urgent*

## Slide 1. Euro area started to lose competitiveness at the turn of the millennium

Long-term developments in productivity per hour worked



Notes: EA-4 is a weighted average of productivity developments in Germany, France, Italy and Spain.

Source: Long-Term Productivity Database and ECB calculations.

These gains were widely shared across euro area economies, reflecting the fast integration in trade and finance in the run-up to the establishment of the EU's Single Market, with new technologies spreading rapidly across borders (Slide 1, right-hand side)<sup>4</sup>.

So, going into the 21<sup>st</sup> century, Europe was operating at the global productivity frontier<sup>5</sup>. Productivity growth was slowing over time, but that was to be expected as the distance to the frontier narrowed. But in the following years, the euro area took a different course and fell behind other economies like the United States.

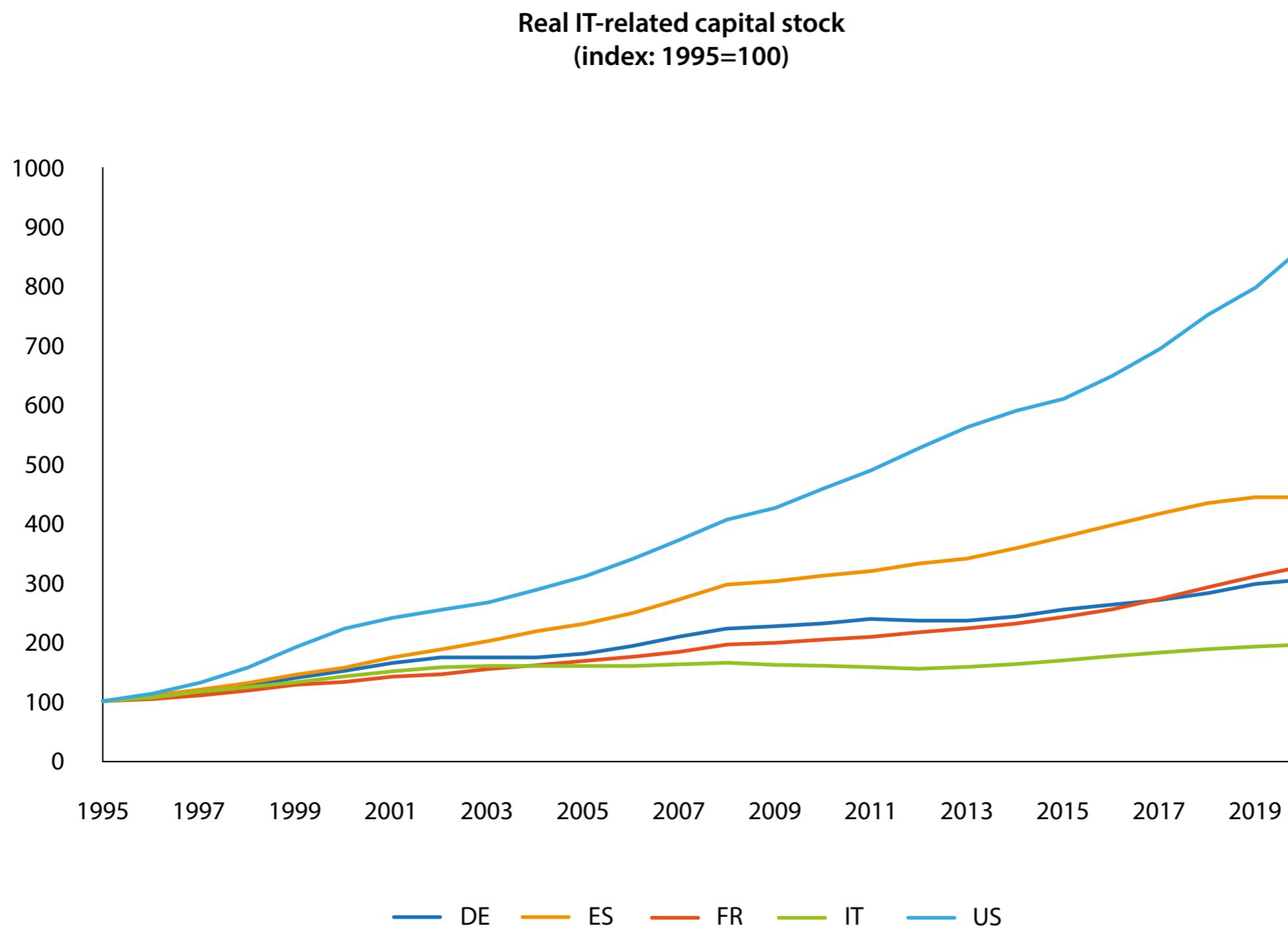
Between 1995 and 2007, annual growth in GDP per hour surged measurably in the United States, whereas it slowed and diverged in the euro area. By the time of the global financial crisis in 2008, euro area economies had accumulated productivity losses of some 20% relative to the United States, with the productivity ratio falling back to 0.8.

The euro area has not been able to recover from this loss of competitiveness. Productivity growth has remained subdued, a development reinforced more recently by the repercussions of the pandemic and the Russian war in Ukraine.

The dismal trajectory of Europe's productivity has been subject to much analysis. Most economists agree that European firms' failure to reap the efficiency gains brought about by information and communication technologies – or ICT for short – is one of the root causes<sup>6</sup>. This shows up in both the capital stock and total factor productivity.

Over the past three decades, a striking gap in the real IT-related capital stock has emerged between the euro area and the United States (Slide 2)<sup>7</sup>. Broad-based investments in ICT fundamentally transformed the US economy, especially the services sector, as ICT became a general purpose technology which radically changed the way many firms operated and served their customers<sup>8</sup>.

## Slide 2. Rising gap in IT-related capital stock between euro area and United States



Note: IT-related capital stock is the sum of computing equipment and computer software & databases for all NACE industries. See Schivardi, F and Schmitz, T (2020), "The IT Revolution and Southern Europe's Two Lost Decades", Journal of the European Economic Association, Vol. 18(5), pp. 2441–2486  
Source: EUKLEMS.

As a result, annual productivity growth in the services sector in the United States increased by 3.2% on average between 1995 and 2005, compared with just 0.9% in Europe<sup>9</sup>.

But even in the United States, the productivity boost driven by the ICT boom proved temporary. Since the global financial crisis, productivity growth has been subdued across advanced economies, despite continued rapid technological change, including the rise of generative artificial intelligence (Slide 3).

The potential causes of this slowdown have been discussed intensively and controversially. Some argue that the most recent technological innovations are simply less revolutionary than earlier inventions, such as the railway, electricity or the telephone<sup>10</sup>.

Others claim that we have yet to see the full benefits of AI and other cutting-edge technologies, as history shows that technology adoption rates can be slow<sup>11</sup>. In 1987 Robert Solow famously remarked that computers were everywhere except in productivity statistics<sup>12</sup>.

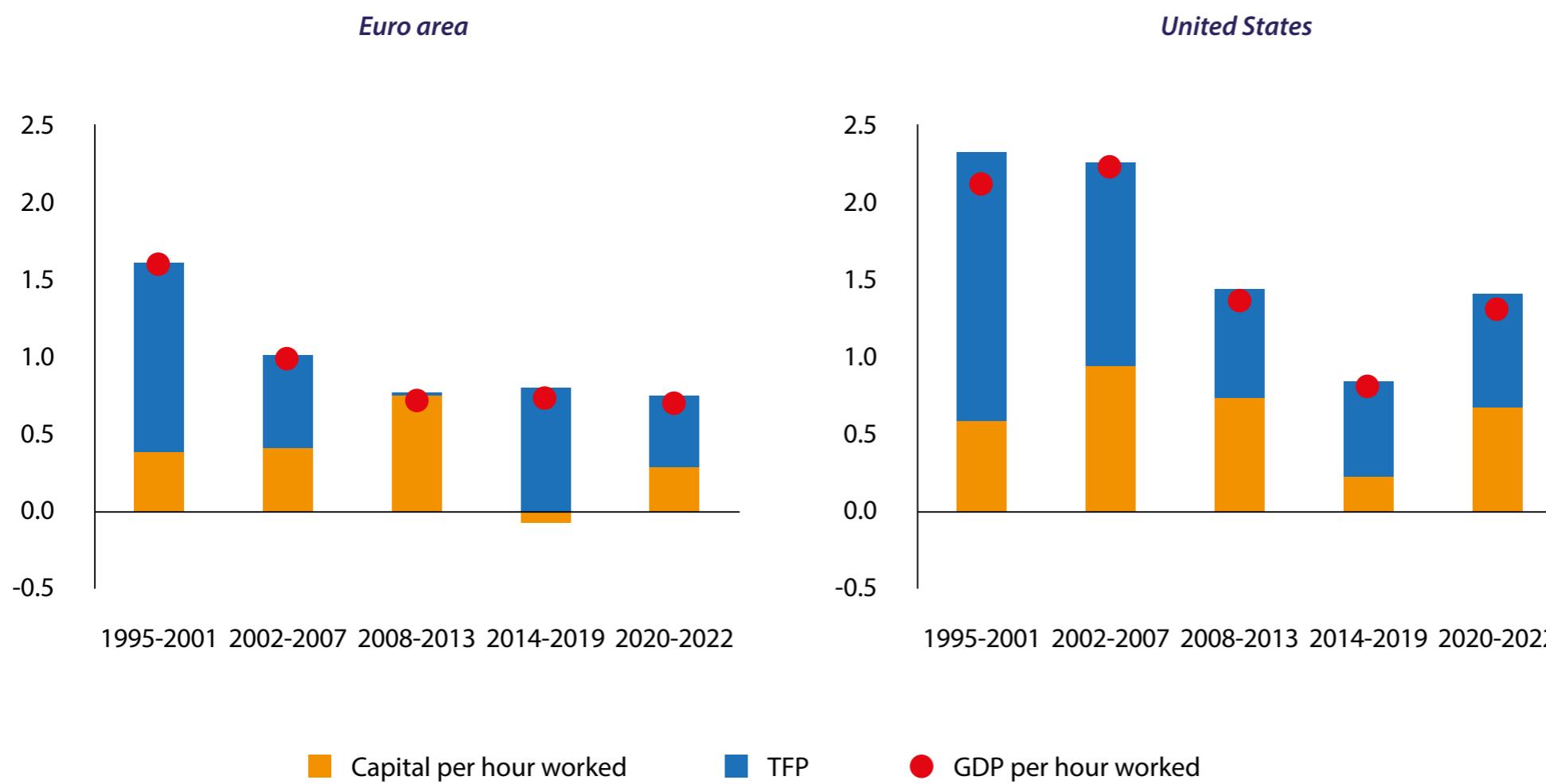
Empirical evidence supports this second hypothesis. It finds that although technologies developed at the global frontier are spreading across countries ever faster, they are spreading to all firms within an economy ever more slowly<sup>13</sup>. Slow technology diffusion is also at the core of why firms in the euro area have failed to benefit from the ICT revolution. Two explanations have been identified in the literature.

### **The role of competition and capital markets**

One is that the business environment in the United States made it easier, or more pressing, for firms to invest in ICT. Despite important progress on reforms in the wake of the sovereign debt crisis, product and labour markets in the euro area often remain heavily regulated<sup>14</sup>. For example, many euro area countries set higher administrative requirements for start-ups than other advanced economies<sup>15</sup>.

## Slide 3. Global productivity growth has been subdued since the global financial crisis

Contributions to growth in GDP per hour worked



Note: Refers to Euro Area 19.

Source: AMECO data and ECB calculations.

High barriers to entry protect the rents of incumbents, reduce technology diffusion and constrain the entry of younger firms, which are more likely to innovate<sup>16</sup>. In the euro area, younger firms that survive are on average almost three times as productive as their older peers (Slide 4, left-hand side)<sup>17</sup>.

Most of this gap can be explained by young ‘superstar’ firms, which increase their productivity on average by around 100% per year. These firms invest more than their competitors, particularly in intangible assets, such as software and databases, and they use fewer and more specialised workers (Slide 4, right-hand side).

The link between firm demography, technology diffusion and productivity growth can be seen in the manufacturing sector in particular. The marked decline in productivity growth of high-tech frontier firms in this sector during the past decade coincided with a measurable slowdown in business dynamism (Slide 5, left-hand side)<sup>18</sup>.

Today, the average age of a high-tech frontier firm in the manufacturing sector is about 50% higher than it was before the global financial crisis, and about twice as high as that of their peers in the services sector (Slide 5, right-hand side). This lack of ‘creative destruction’ is often associated with a lower level of innovation activity<sup>19</sup>.

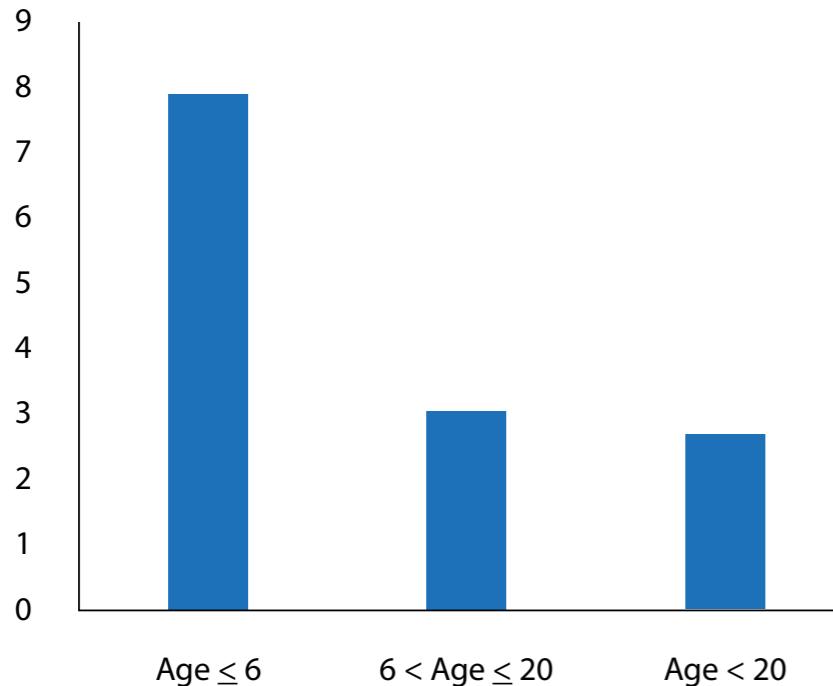
Empirical evidence also shows that firm size is an important factor driving investments in ICT, as the fixed costs related to process reorganisation weigh particularly on small and medium-sized enterprises<sup>20</sup>.

However, higher administrative requirements may prevent younger firms from expanding. In France, for example, several labour laws only become binding when a firm exceeds the 50-employee threshold<sup>21</sup>. Such requirements have made it harder for euro area firms to grow to a sufficient size. In the United States, firms with more than 250 employees account for almost 60% of total employment (Slide 6). In the euro area, the share is between 12 and 37%.

## Slide 4. Lower barriers to entry and higher competition support rise of young superstar firms

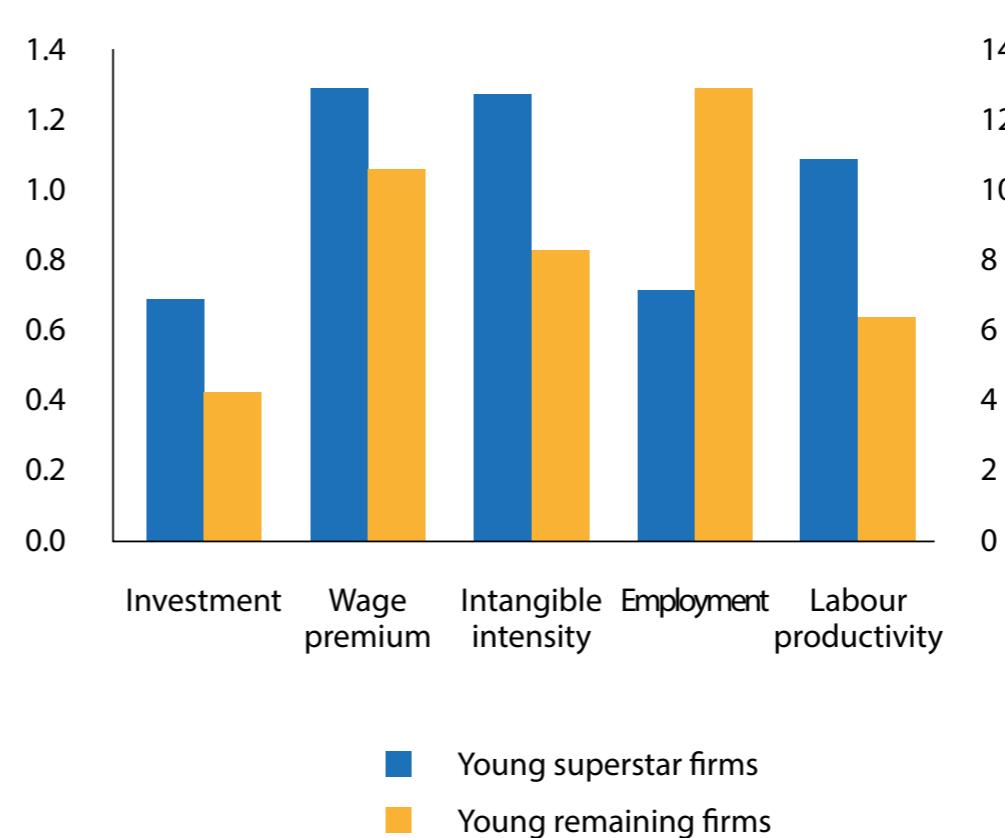
Annual labour productivity growth of surviving firms by age group

(mean, in %)



Average characteristics of young superstar firms and other young firms

(lhs: ratio; rhs: number of employees, intangible intensity in € thousands, labour productivity in € ten-thousands)

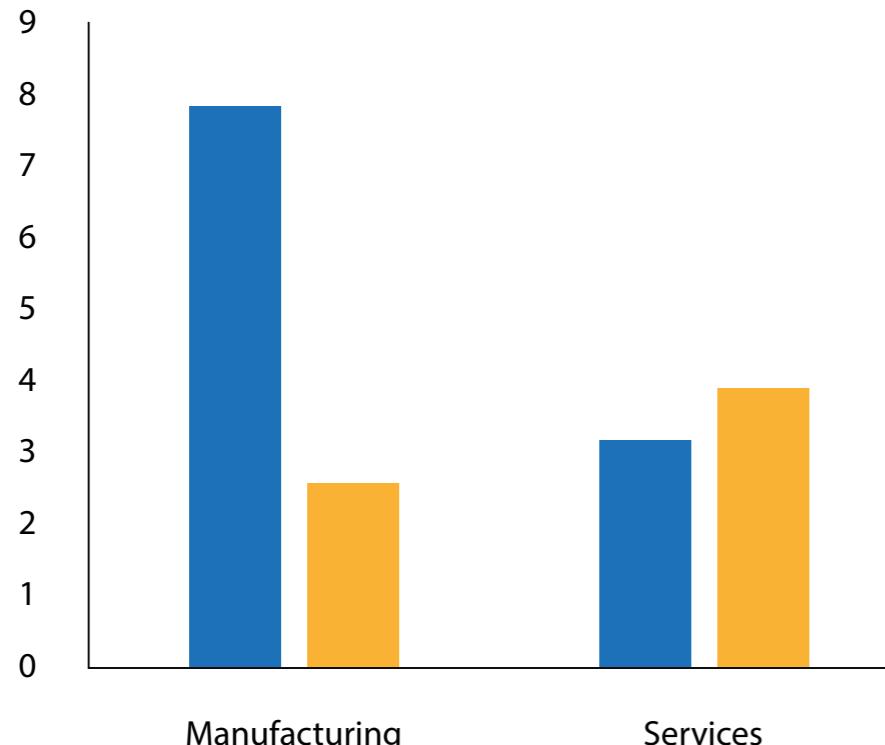


*Notes: Each bar represents the coefficient from a regression of each variable listed in the x-axis on a dummy for the firm being a young superstar firm and a set of fixed effects controlling for the different countries, sectors and years. Productivity is computed as real value added per employee at the firm level. Intangible intensity is computed as the ratio of intangible capital to number of employees. Investment is computed as the change in real fixed tangible capital over the previous period's real fixed tangible capital. The period considered begins after the great financial crisis to avoid potential slumps.*

*Source: ECB Economic Bulletin Issue 1(2022). Data from Bureau van Dijk Orbis, the Bank for the Accounts of Companies Harmonized (BACH) database and ECB staff calculations.*

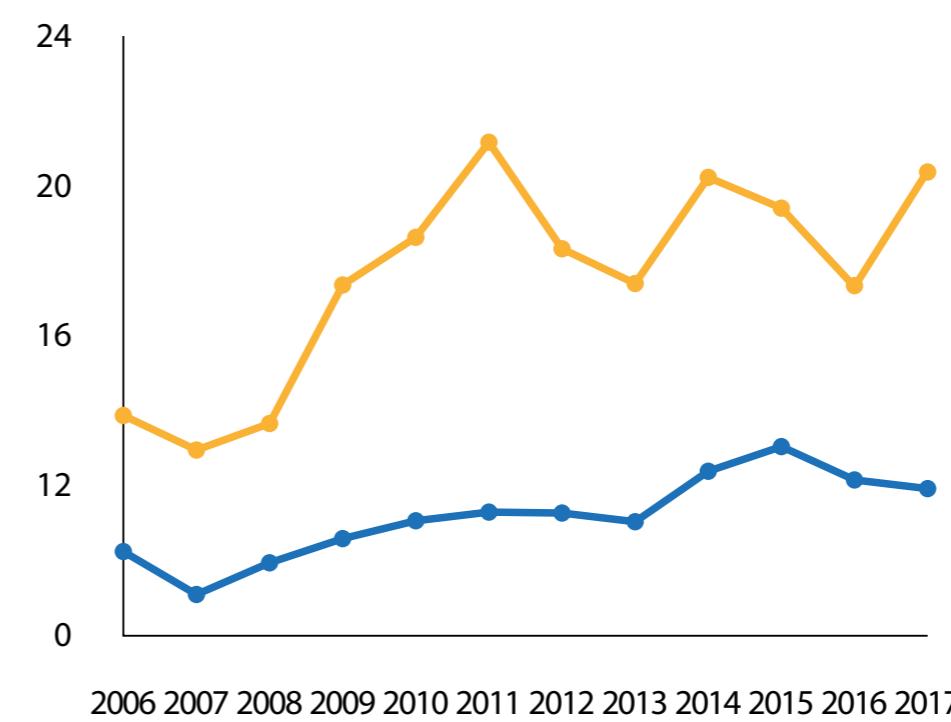
## Slide 5. Decline in productivity growth in manufacturing coincided with lower business dynamics

TFP growth of high-tech frontier firms



Age of high-tech frontier firms

(years of activity)



■ 2005-2007

■ 2013-2017

○ — Manufacturing

● — Services

Notes: Weighted average annual TFP growth rates of the top 5% most productive firms in a given year in a 4-digit industry. Manufacturing industries are classified according to their R&D intensity (R&D by value added of the industry) into high-technology and medium high-technology on the one hand, and medium low-technology and low-technology on the other hand following the Eurostat classification. Service industries are classified into knowledge-intensive services and less knowledge-intensive services based on the share of tertiary educated persons at NACE 2-digit level, also following Eurostat standards.

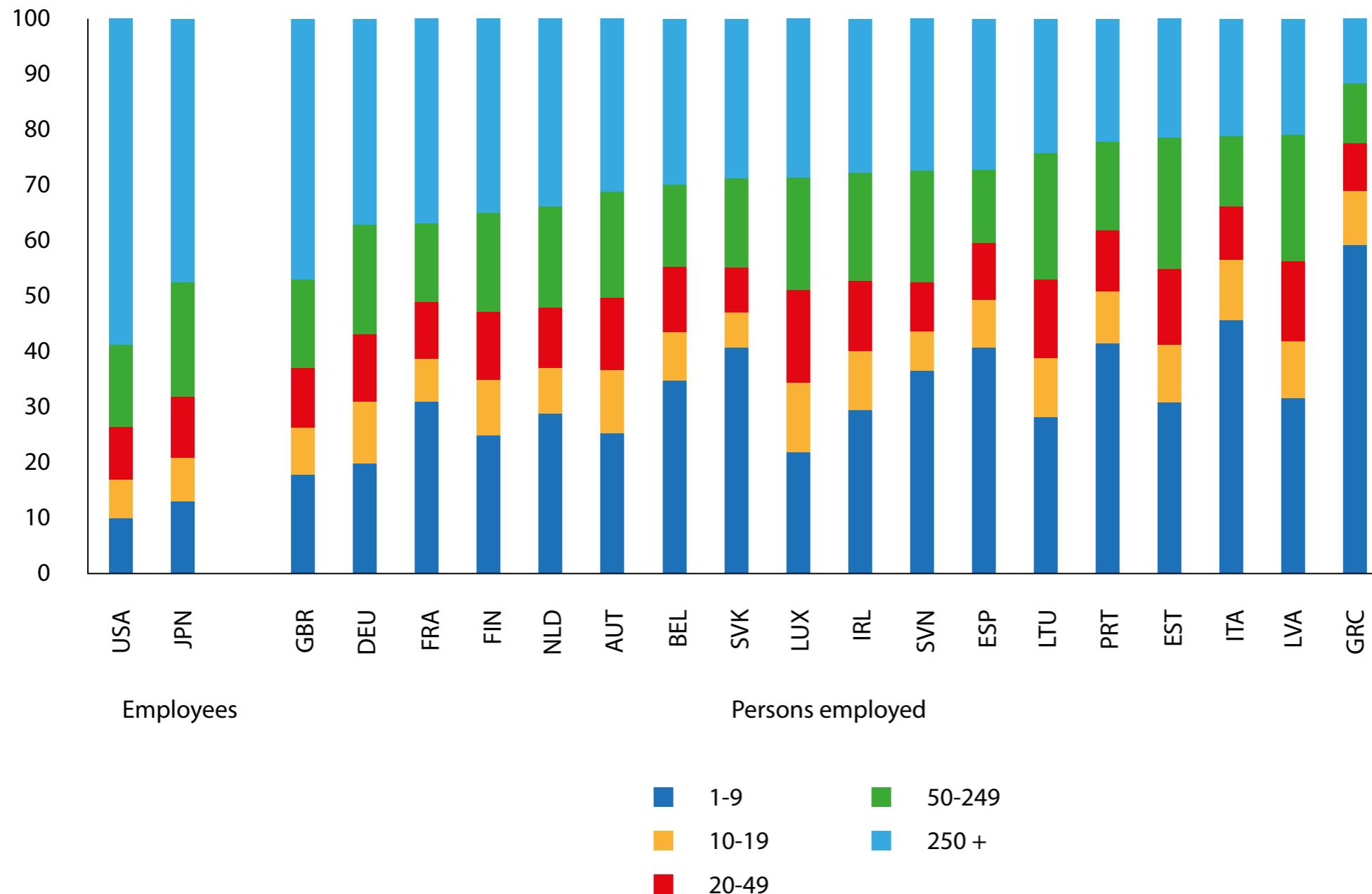
Sources: Occasional Paper Series No. 268 (ECB). Own calculations using ECB iBACH-Orbis Database.

## **Slide 6. Large firms invest more in ICT, but most firms in the euro area are small**



## **Employment by enterprise size, business economy**

(percentage of total employment)



*Notes: Legend refers to number of employees/ persons employed at firm level.  
Source: OECD.*

Similarly, the lack of external capital often makes it difficult for firms to scale up. In the euro area, venture capital investments are much lower than in the United States, so that many innovative companies hit funding constraints once they have entered the growth phase<sup>22</sup>. This may lead them to relocate to places where funding is more readily available and capital markets are deeper.

Having young firms that are highly productive, while displaying low productivity at country level means that a large part of our available resources is stuck in corners of our economies that are comparatively less productive.

### **The US management hypothesis**

A large body of empirical evidence suggests, however, that broader business conditions have not been the only impediment to ICT-related productivity growth in the euro area.

A look at US multinationals doing business in Europe illustrates this well<sup>23</sup>. These firms have significantly higher productivity gains from IT than their European peers, despite facing the same regulatory environment. This seems to be because US firms consistently score higher in people management practices.

The ‘US management hypothesis’ rests on the observation that IT adoption requires complementary changes in a firm’s organisation to reap the productivity gains of digital technologies<sup>24</sup>.

That is, as the price of IT equipment falls and computational capacity rises, improvements in productivity mainly depend on skilled people using data, software and new procedures that leverage these technologies.

The experience of police departments in the United States is a good example<sup>25</sup>. Higher IT investment alone had no statistically significant effect on reductions in crime rates or increases in clearance. However, when IT adoption

was complemented by the introduction of CompStat – a management system created by the New York City Police Department – crime rates fell and clearance rates rose.

The evidence from the euro area confirms these patterns. Research by ECB staff shows that only about 30% of firms, those closest to the technology frontier, manage to use digital technologies in ways that raise productivity over time (Slide 7, left-hand side)<sup>26</sup>. For most firms, investment in ICT has no significant impact on their efficiency.

In other words, digital technologies require a large stock of human and managerial capital. In many euro area countries, however, a significant share of adults – in some cases more than a third – have not completed upper secondary school (Slide 7, right-hand side). Such gaps in the education system can help explain why many firms have not been able to reap the benefits of the ICT revolution so far.

### **Why Europe urgently needs to tackle its competitiveness crisis**

Closing the euro area's technology gap has become more urgent than ever. Russia's war of aggression against Ukraine is weighing heavily on the price competitiveness of euro area firms. Today, electricity prices in the industrial sector in the EU are almost three times as high as in the United States and more than twice as high as in China (Slide 8, left-hand side).

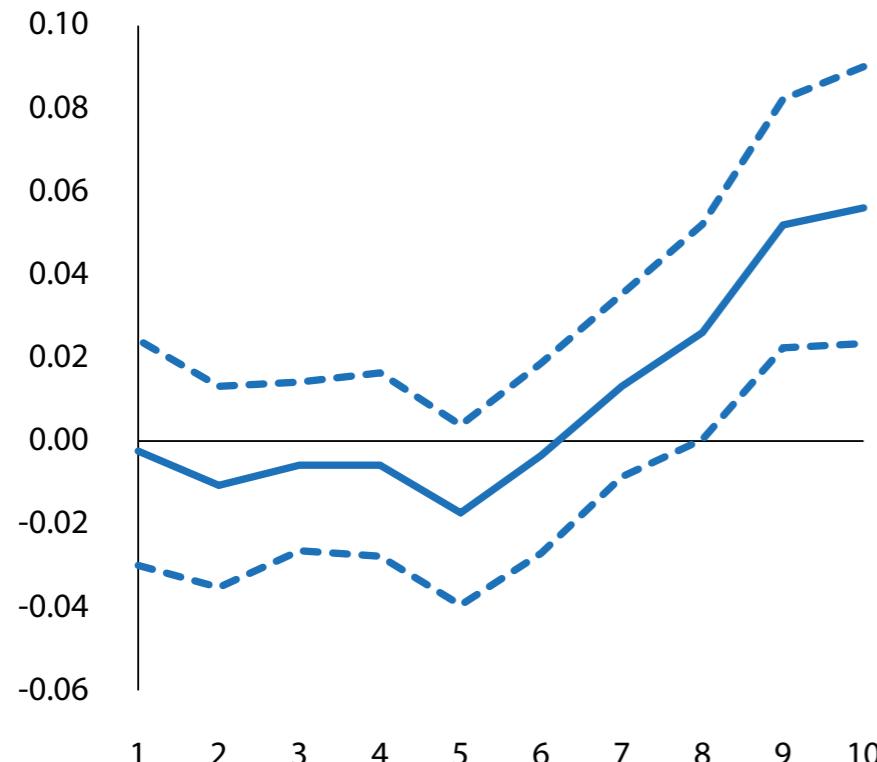
As a result, the production of high energy-intensive goods is declining at a concerning pace, undermining the euro area's stronghold in traditional industries (Slide 8, right-hand side).

Energy from fossil fuels is bound to become even more expensive over time as carbon prices rise. This implies that the only way to sustainably regain competitiveness is to reduce our dependency on fossil fuels by accelerating the green transition.

## Slide 7. Few firms reap benefits from digitalisation, also reflecting shortages of skilled workers

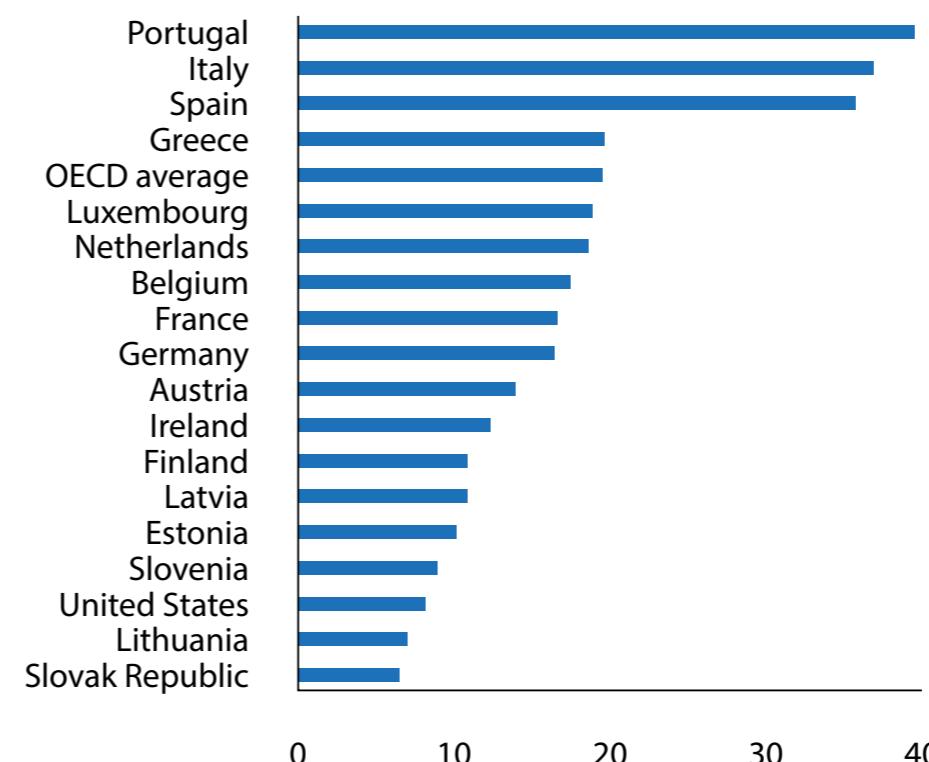
Estimated impact of digitalisation on TFP growth  
of firms with different initial TFP levels

(digital investment intensity)



Share of adults without upper secondary education

(% of 25-61 year olds)



Ihs Note: x-axis: proximity to frontier (decile, lowest-highest). Dashed lines refer to confidence intervals.

Source: Anderton, R, Botelho, V and Reimers, P, "Digitalisation and productivity: gamechanger or sideshow?", Working Paper Series, No 2794, ECB, March 2023.

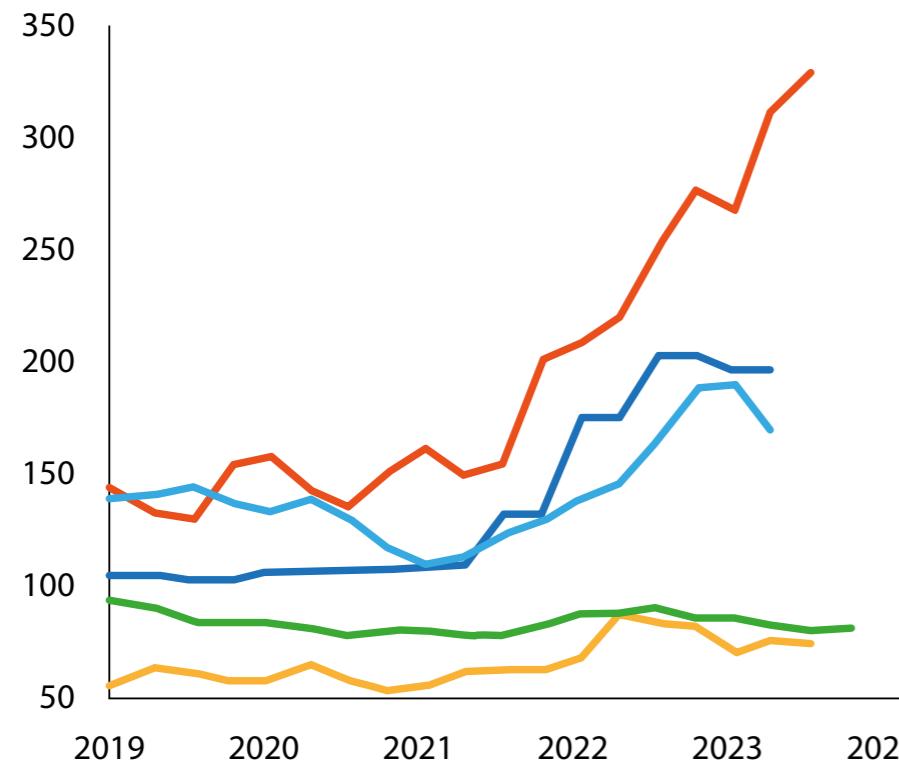
rhs Notes: Data refer to 2022 or latest available.

Source: OECD.

## Slide 8. Higher electricity prices undermine price competitiveness and industrial production

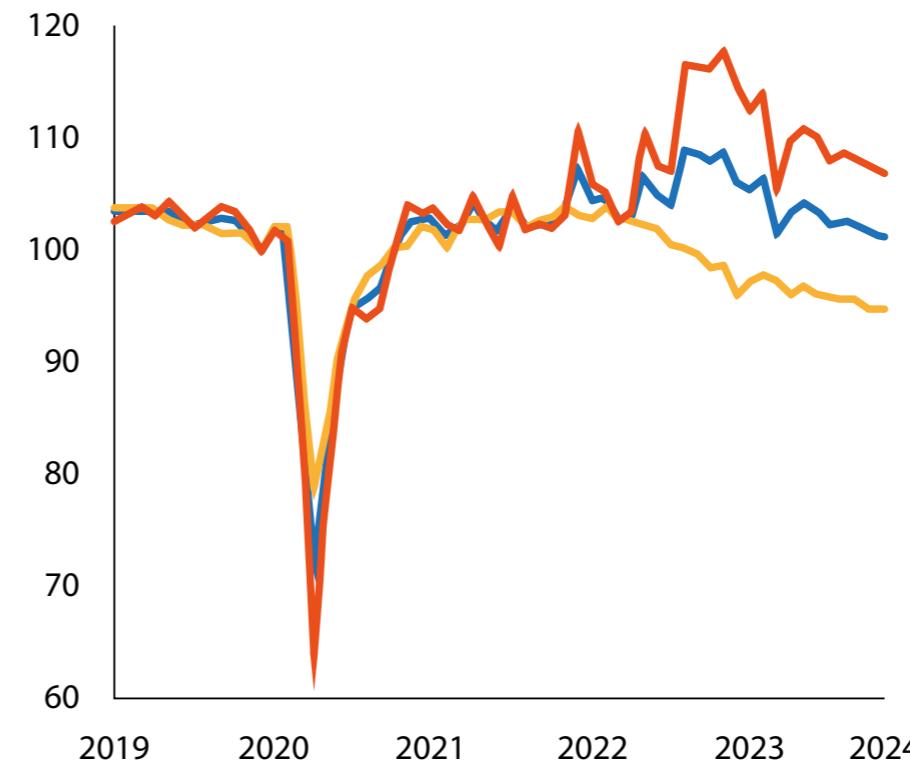
Industrial retail energy prices

(€/MWh)



Euro area industrial production

(index: December 2019 = 100)



Ihs Latest observation: Q2 2023 for EU and JP, Q3 2023 for US and UK and Q4 2023 for KR and CN.

Sources: Eurostat, EIA, DESNZ, CEIC, METI and ECB staff calculations.

rhs Notes: Data are seasonally-adjusted. Industrial production indices for individual sectors are aggregated with value-added weights. Low (high) energy-intensity sectors are defined as those with an energy intensity lower (higher) than that of the median sector. For more details, see Chiacchio, De Santis, Gunnella and Lebastard (2023).

Latest observation: November 2023.

Sources: Eurostat, Trade Data Monitor and ECB staff calculations.

However, since high carbon-intensive sectors, such as mining, refineries and air transport, have so far been on average more productive than greener ones, the reallocation of production factors across sectors during the green transition will mechanically reduce aggregate productivity over the short run<sup>27</sup>.

Boosting technology adoption in less carbon-intensive sectors could help offset some of these effects. And by raising wages and reducing inflation, this could also secure public support for the green transition.

Domestic headwinds are further aggravating the euro area's productivity malaise. Three of them are particularly relevant.

### **Demographic headwinds require higher productivity growth**

First, the euro area is facing demographic change of unprecedented magnitude. Based on the latest population projections by Eurostat, the old-age dependency ratio - that is the number of people aged 65 or above relative to those of working age (20 to 64) - is expected to increase on average from 37% in 2022 to 60% in 2070 (Slide 9, left-hand side).

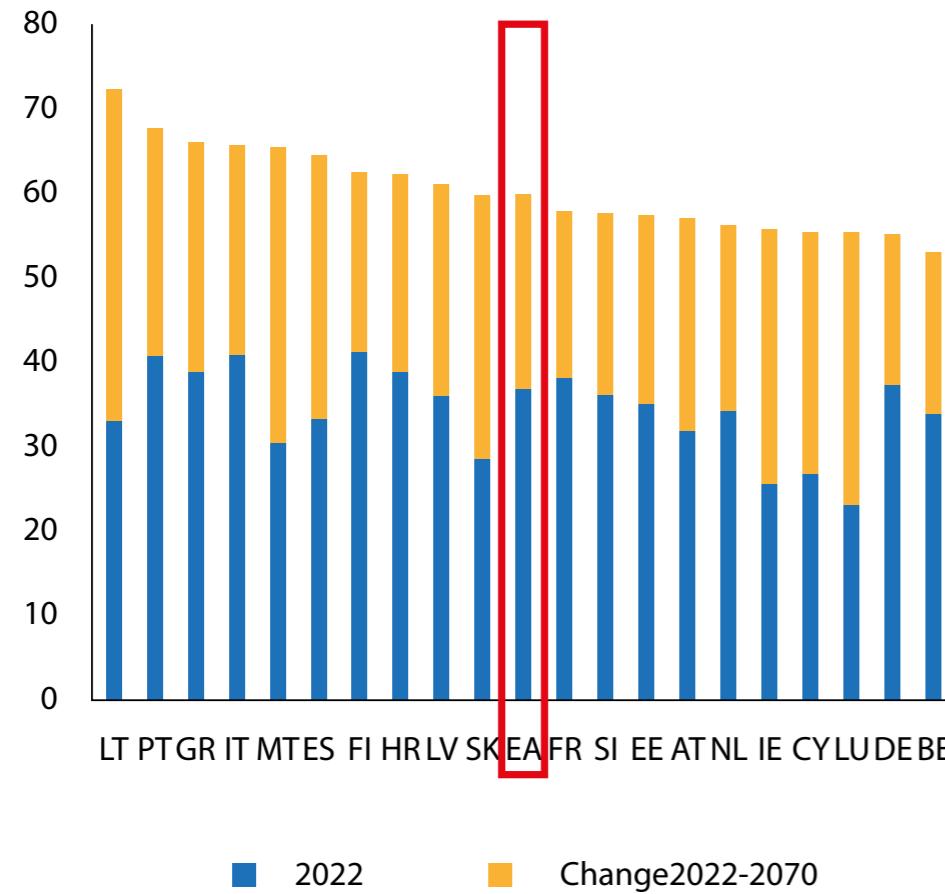
The rapid ageing of our society coincides with a shift in preferences, as more and more people prefer to work fewer hours. Average hours worked per employee have been on a secular downward trend since the 1970s, mostly reflecting a decline in the number of hours employees desire to work (Slide 9, right-hand side). With fewer working-age adults working fewer hours per each elderly person, output per hour worked needs to increase for our social system to remain sustainable.

### **Slow technology diffusion risks raising market concentration**

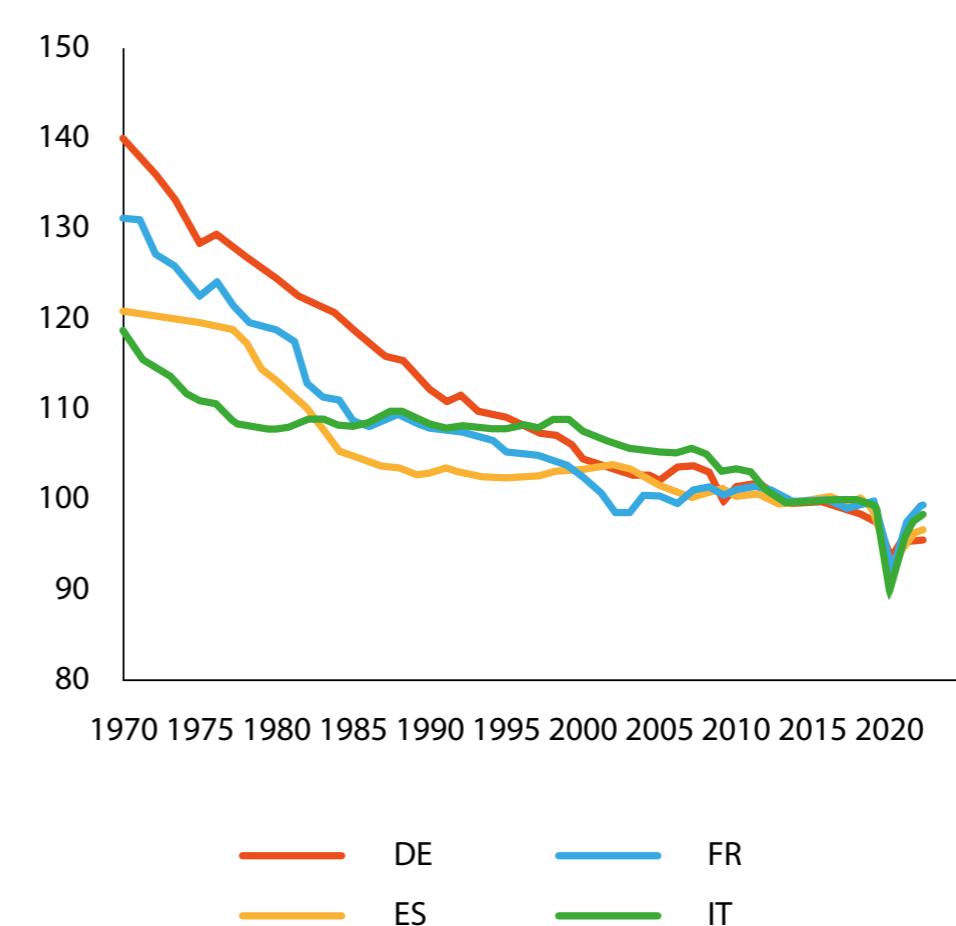
Second, as productivity gains from digitalisation remain confined to a few highly innovative and productive firms, we are seeing a concerning trend in market concentration.

## Slide 9. Ageing and preference shifts require higher productivity growth to sustain social system

Old-age dependency ratio in 2022  
and increase until 2070



Average hours worked per person employed  
(index: 2015 = 100)



*Ihs Note: The old-age dependency ratio is the population aged 65 and over as a % of the population aged 20-64. Data are shown as the proportion of dependents per 100 persons of working-age.*

*Source: European Commission Europop 2023 population projections.*

*rhs Source: OECD data.*

Recent estimates by ECB staff suggest that while the median price mark-up of firms has remained broadly unchanged over the past two decades, the upper tail of the mark-up distribution has increased considerably (Slide 10, left-hand side)<sup>29</sup>.

Such 'winner-takes-most' dynamics are mainly observed in the services sector, where the productivity gap between frontier and non-frontier firms has been widening rapidly, also because many laggards have failed to exploit the efficiency gains from ICT (Slide 10, right-hand side).

The experience of the United States suggests that the rise of 'superstar' firms, such as Apple, Amazon and Alphabet, can have lasting macroeconomic consequences and can help explain several secular trends, including the fall in the labour share of income and the rise in income inequality in the United States<sup>30</sup>.

Moreover, to the extent that some monopoly rents are increasingly earned outside the euro area, such 'winner-takes-most' dynamics increase the dependency of domestic firms on third countries for the supply of technology, constraining strategic autonomy.

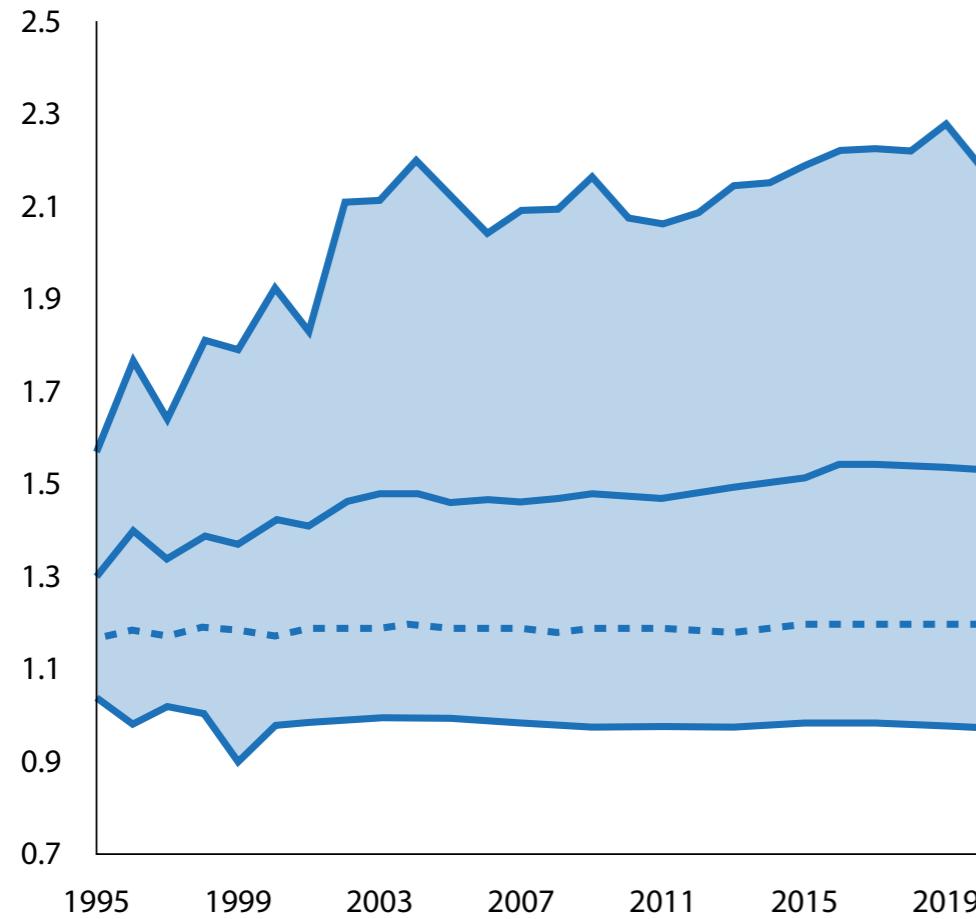
### **Productivity growth supports monetary policy**

Third, productivity growth is a key determinant of medium-term inflation and real interest rates, which means it directly affects the conduct of monetary policy.

Over the past year, we have made considerable progress in restoring price stability after the largest inflationary shock in decades (Slide 11, left-hand side). Raising our key interest rates was instrumental in curbing high loan growth that risked entrenching the adverse cost-push shocks that the euro area economy had faced since 2020<sup>31</sup>.

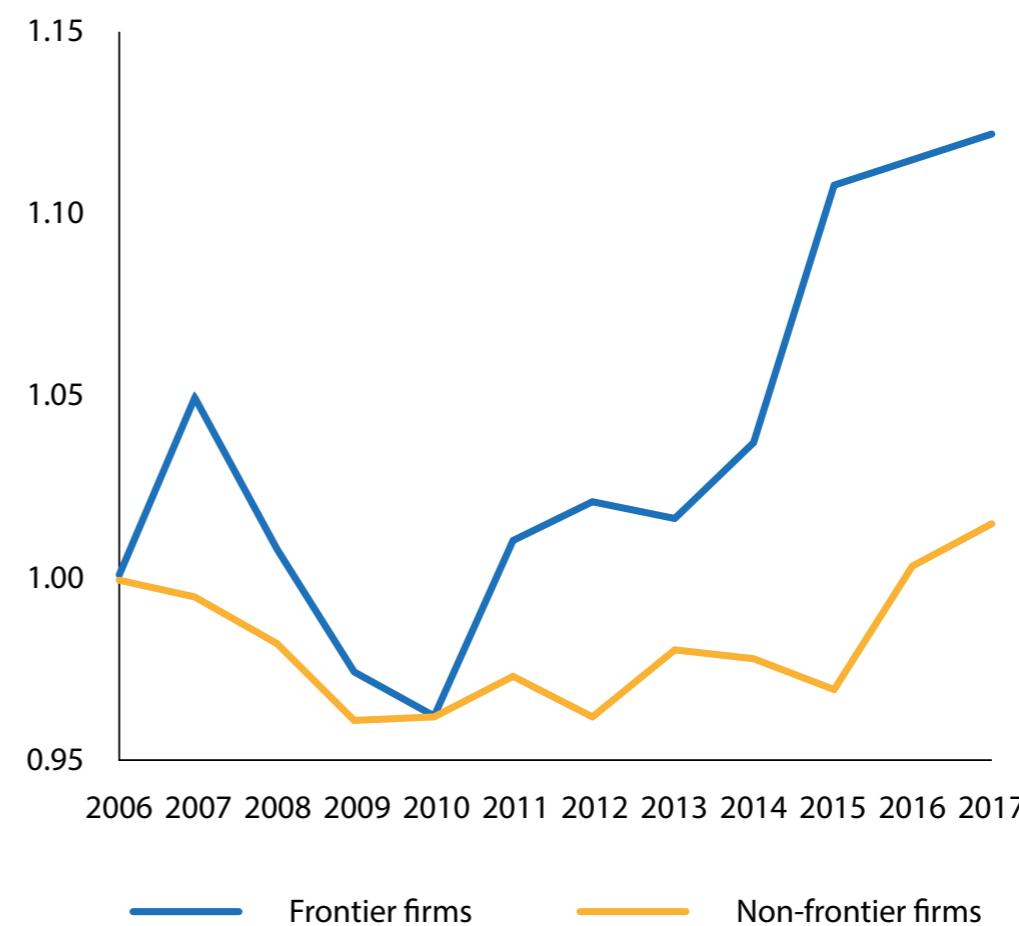
## Slide 10. Slow diffusion of technologies can give rise to 'winner-takes-most' dynamics

Euro area markup distribution



TFP levels of frontier and non-frontier firms in the services sector

(2006 = 1)



*Ihs Notes:* The dotted line shows the weighted median, the continuous line the weighted average, and the range is between the weighted 10<sup>th</sup> and 90<sup>th</sup> percentiles. See the paper for the calculation of markups using firm-level data.

Sources: Kouvavas et al (2021), "Markups and inflation cyclicality in the euro area", ECB Working Paper No. 2671.

*rhs Notes:* Frontier firms are defined as those at the top 5% of the TFP distribution in a given year in a 4-digit industry. Non-frontier firms are defined as the median firm in a given year in a 4-digit industry.

Sources: Occasional Paper Series No. 268 (ECB). Own calculations using ECB iBACH-Orbis Database.

But persistently low, and recently even negative, productivity growth exacerbates the effects that the current strong growth in nominal wages has on unit labour costs for firms (Slide 11, right-hand side). This increases the risk that firms may pass higher wage costs on to consumers, which could delay inflation returning to our 2% target.

In this environment, monetary policy needs to remain restrictive until we can be confident that inflation will sustainably return to our medium-term target. The recent long period of high inflation suggests that, to avoid being forced into adopting a stop-and-go policy akin to that of the 1970s, we must be cautious not to adjust our policy stance prematurely.

Measures that help firms boost productivity growth directly support monetary policy in achieving its objective of securing price stability over the medium term<sup>32</sup>.

Such measures would also expand the future policy space for central banks if faced with new disinflationary shocks. This is because higher productivity growth pushes up the marginal product of capital and hence the neutral real interest rate  $r^*$ , which is the interest rate at which monetary policy is neither expansionary nor restrictive<sup>33</sup>.

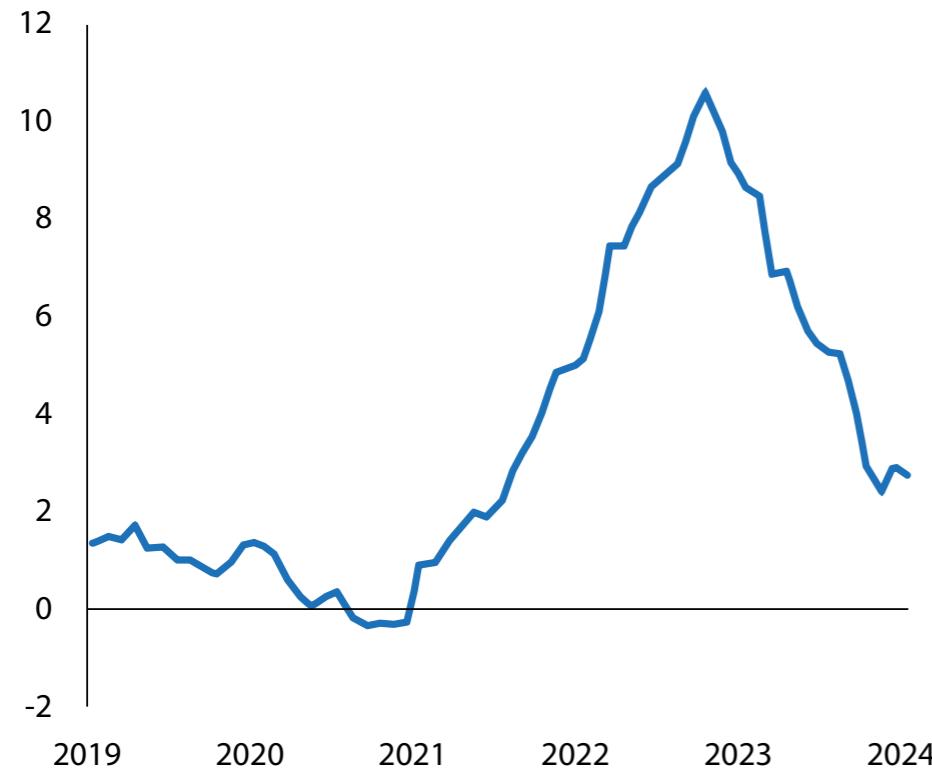
New estimates show that an increase in trend productivity growth by one percentage point can increase  $r^*$  by 0.6 percentage points<sup>34</sup>. A higher  $r^*$  would reduce the need to embark on unconventional policy measures that often come with larger side effects<sup>35</sup>.

### **How to boost productivity?**

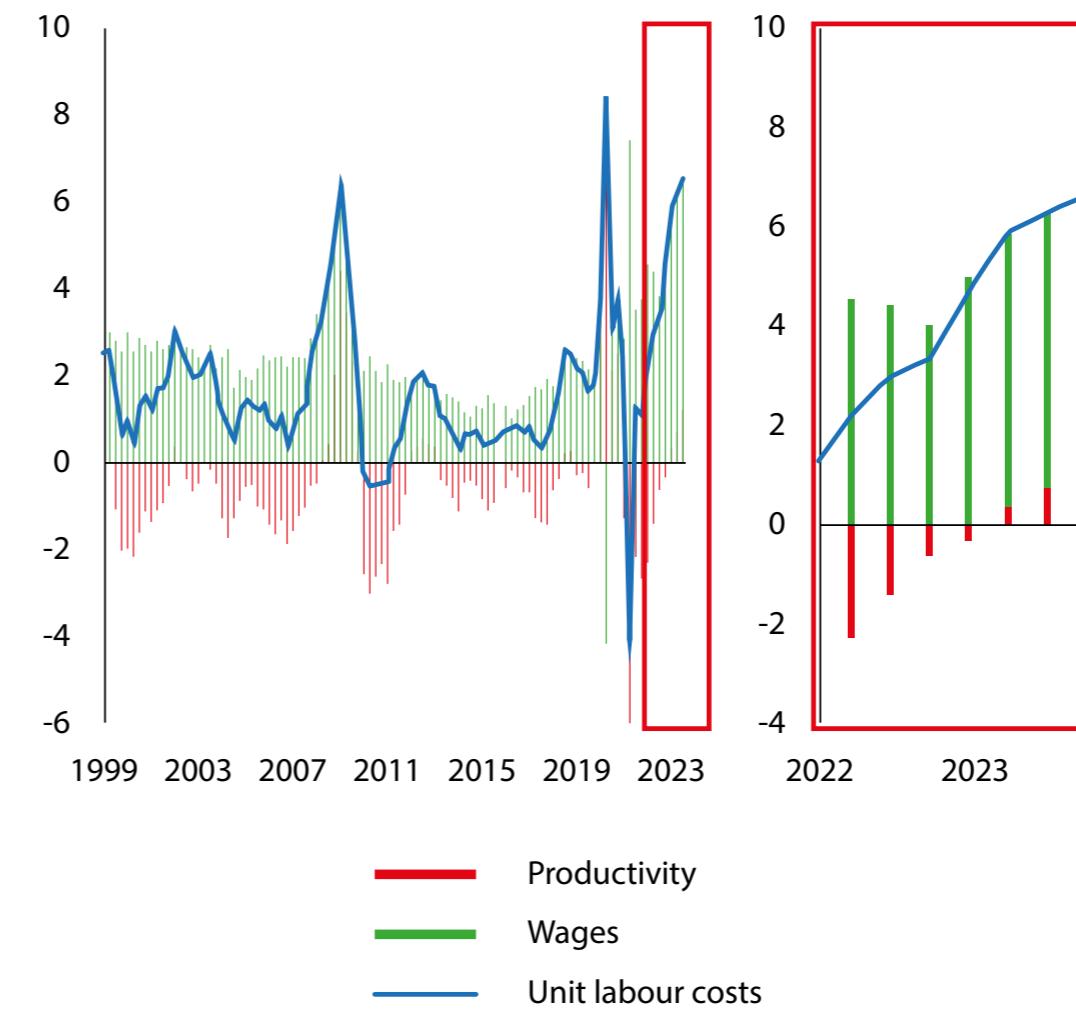
How, then, can we solve the euro area's competitiveness crisis? My diagnosis of the problem suggests that aggregate productivity growth depends both on how technologies are used and advanced at the firm level – the management hypothesis – and on how resources are allocated across firms – in other words the broad business environment<sup>36</sup>.

## Slide 11. Restrictive monetary policy needed to contain pass-through of rising unit labour costs

Headline inflation in the euro area (HICP)  
(annual percentage changes)



Unit labour costs  
(annual percentage changes)



Ihs Last observation: January 2024 (flash).  
Source: Eurostat.

rhs Note: A positive contribution of productivity to unit labour costs implies negative productivity growth.  
Last observation 2023 Q3  
Source: Eurostat and ECB calculations.

There are important interactions between these two factors. A slower technology diffusion across firms, as suggested by the divergence of productivity between frontier and laggard firms, boosts the gains that arise from reducing an inefficient allocation of resources<sup>37</sup>.

These gains are estimated to be significant in the euro area<sup>38</sup>. In Italy, for example, it is estimated that aggregate productivity in the manufacturing sector would be around 15% higher if national frontier firms were as large as the global frontier benchmark (Slide 12)<sup>39</sup>.

If these firms were empowered to scale up, aggregate productivity growth could rise significantly. This is what happened in the United States in the 1970s and 1980s. Research shows that a substantial part of productivity growth in manufacturing during this period can be explained by output shifting from less productive to more productive firms<sup>40</sup>.

The European Commission recently presented concrete action points for improving competitiveness in the euro area, and it is working towards a regulatory framework for enhancing growth<sup>41</sup>. In addition, Mario Draghi is expected to deliver a comprehensive report on the EU's competitiveness later this year.

From a euro area perspective, I see three mutually reinforcing factors as critical for reducing resource misallocation and for promoting and easing the diffusion of digital technologies in the euro area.

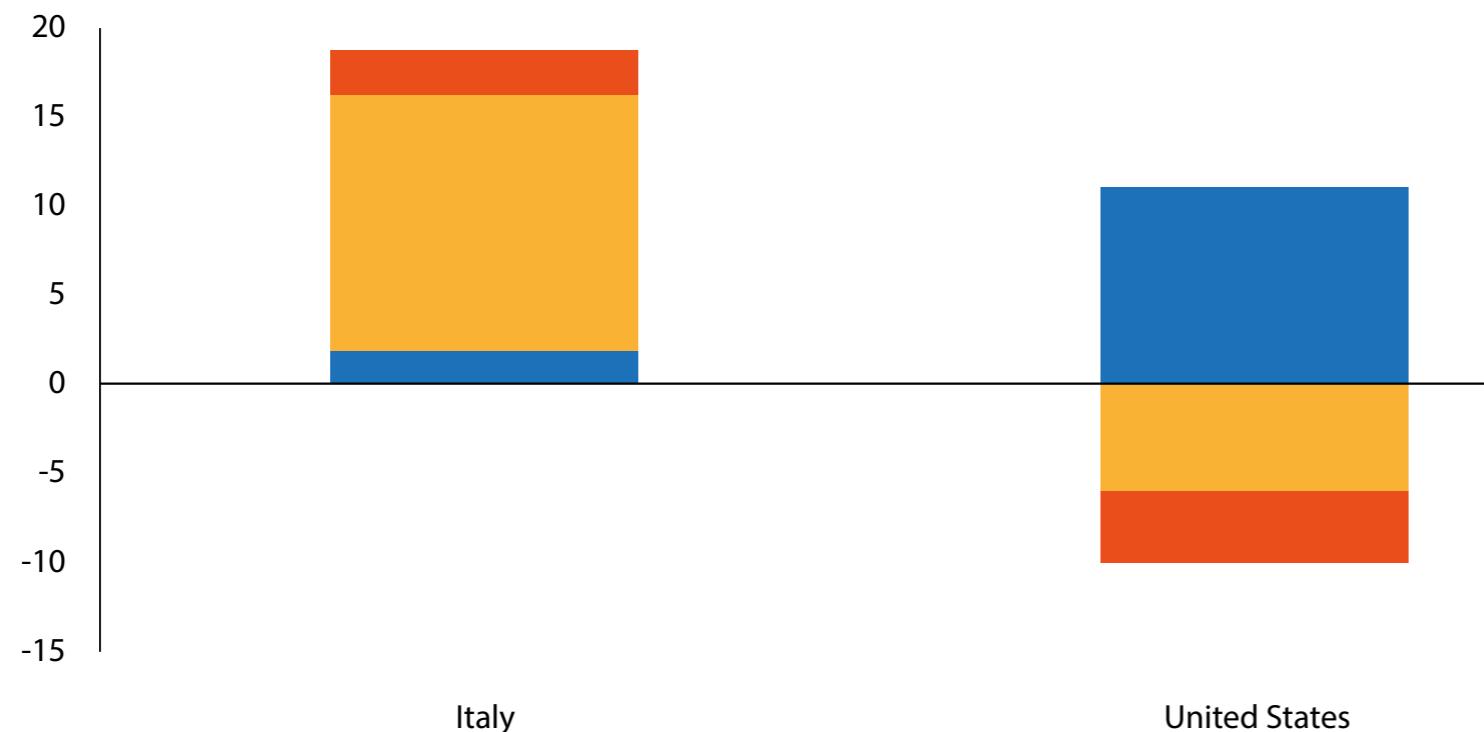
### **Increased competition raises diffusion of skills**

First, we need a regulatory framework that more strongly embraces and encourages competition. There is broad evidence showing that strict product market regulations, rigid labour markets and excessive red tape have significantly inhibited the adoption of digital technologies in the past<sup>42</sup>.

## Slide 12. Reducing resource misallocation can measurably increase productivity growth

How much would overall manufacturing sector productivity rise if firms at the national frontier were as productive and large as firms at the global frontier?

(percentages)



Note: The productivity (size) gap shows how much higher manufacturing productivity would be relative to baseline if the national frontier firms (NF) were as productive (large) as the global frontier (GF) benchmark. The cross term shows the impact on aggregate productivity of simultaneously closing the productivity and size gaps. The estimates are constructed by taking the difference between counterfactual labour productivity and actual labour productivity. The counterfactual gaps are estimated by replacing the labour productivity (employment) of the top 10 NF firms with the labour productivity (employment) of the 10<sup>th</sup> most globally productive firm in each two-digit sector. The industry estimates are aggregated using US employment weights.

Source: Andrews, D, Criscuolo, C and Gal, P (2015), "Frontier Firms, Technology Diffusion and Public Policy: Micro Evidence from OECD Countries," OECD Productivity Working Papers.

Since the euro area sovereign debt crisis, many governments have made measurable progress in making their economies more flexible and less rigid<sup>43</sup>. However, the momentum of reform slowed notably after 2012.

In an environment of rapid technological change, this slowdown has made existing regulation more costly, as the impact of regulations on economic activity is highly state-dependent.

For example, competition policies are typically less important in countries that are far away from the global technological frontier. During the 1960s and 1970s Europe was able to catch up with the United States despite lower business dynamics<sup>44</sup>.

In today's digital world, however, competition matters significantly more than it did in the 20<sup>th</sup> century. Research shows that stronger competition is associated with significant improvements in managerial ability, which we have seen is a key ingredient in reaping the benefits of digitalisation<sup>45</sup>.

To kickstart this virtuous circle, the cost of firm entry and expansion as well as the cost of closing a failing business need to be reduced. For example, in the euro area it takes, on average, more than twice as long as in the United States – two years instead of one – for creditors to recover what they are owed after a company defaults.

Bolstering the Schumpeterian process of creative destruction has become even more important after the pandemic, as government support schemes have led to fewer firms exiting the market than during previous crises, although this process has started to reverse.

### **Strengthening the Single Market and fostering integration**

Second, we need to foster integration in the euro area. Firms operating in larger markets can more easily build economies of scale and tend to be more innovative<sup>46</sup>. The single market is our strongest weapon for combining our

economic weight and allowing European firms to compete and thrive in an environment where the ‘winner takes most’<sup>47</sup>.

However, the level of European integration, especially in the area of market services, which account for around 70% of the EU’s GDP, remains disappointing. Intra-EU trade in services accounts for only about 15% of GDP compared with more than 50% for goods (Slide 13, left-hand side).

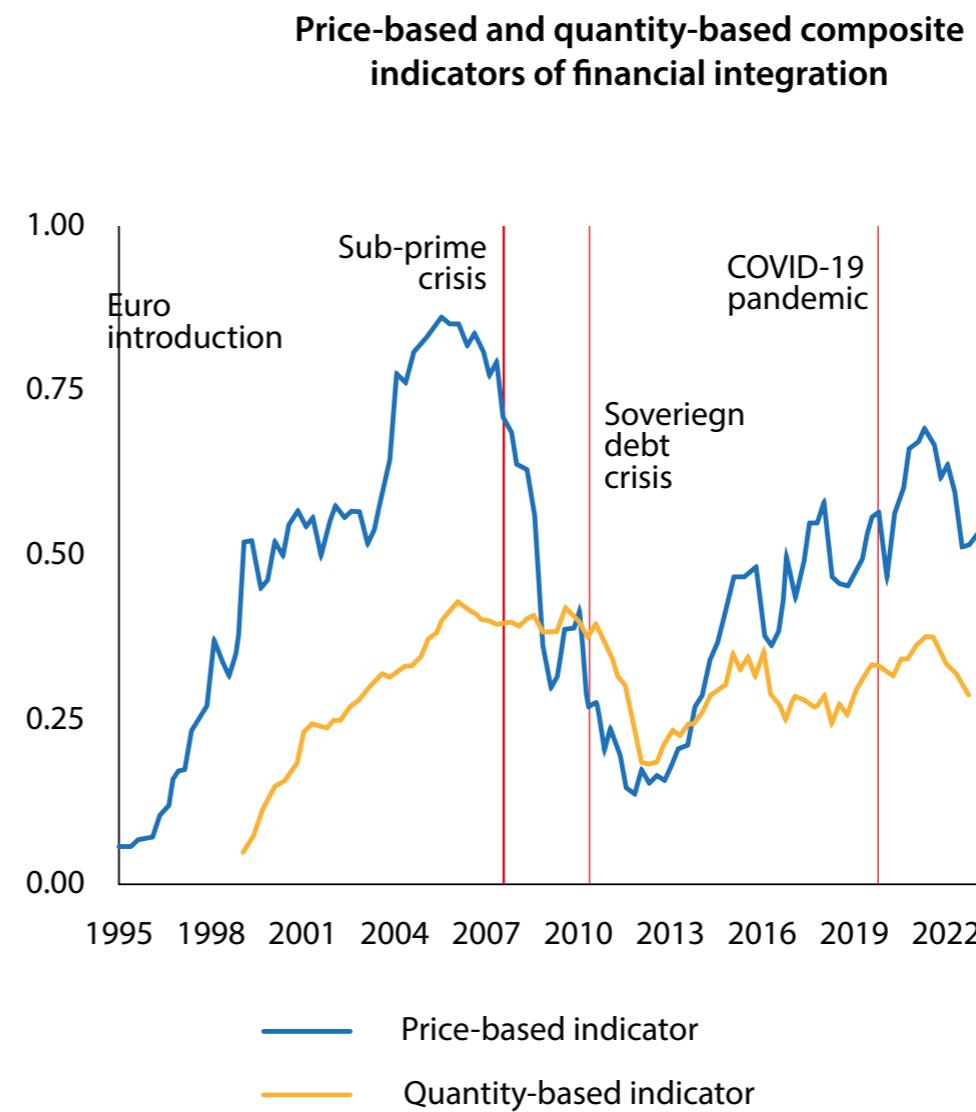
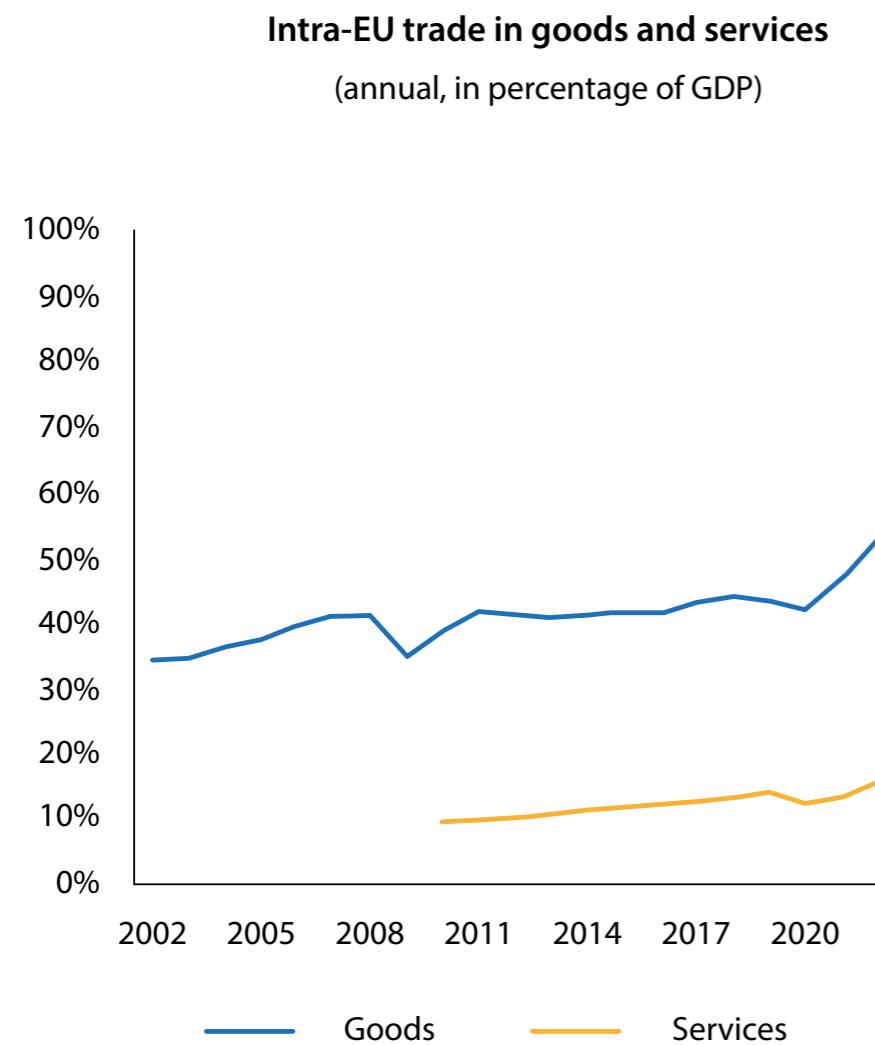
Similarly, only 25% of large firms offer crossborder online sales in the EU. For small and medium-sized enterprises, the share is below 10%. To a significant extent, this reflects remaining regulatory and administrative barriers restricting crossborder trade in services, with little if any progress having been made in addressing this in recent years.

Our financial markets also remain segmented along national borders. Financial integration in the euro area has not increased from where it stood in the early years of monetary union. This contributes to capital misallocation and reduces the potential for crossborder risk sharing (Slide 13, right-hand side).

Research shows that deeper and more integrated capital markets could measurably boost diffusion of technology: increasing access to capital can reduce the distance from the technological frontier by 5 to 7 %<sup>48</sup>.

ECB President Christine Lagarde recently laid out how important timely progress towards a true capital markets union is for succeeding in the ongoing green and digital transitions<sup>49</sup>. Consolidating rules and market infrastructures and reviving the securitisation market would go a long way towards reducing segmentation and improving access to external finance<sup>50</sup>.

## Slide 13. Limited progress in crossborder trade in services and in financial market integration



Ihs Notes: Intra-EU trade is obtained by summing intra-exports and imports as a ratio of GDP, measured in euros.

Latest observation: 2022.

Source: Eurostat and ECB staff calculations.

rhs Source: ECB staff calculations.

Completing banking union is equally important. Banks remain the backbone of our economy. Yet, since the establishment of ECB Banking Supervision in 2014, we have made little progress in creating the conditions for banks to operate freely across borders. Total EU crossborder assets held by banks, especially via subsidiaries, remain far below the level seen before the sovereign debt crisis (Slide 14).

Deepening our banking union requires two additional steps. One is reducing regulatory impediments that continue to hinder crossborder consolidation and competition. These impediments include fragmented tax and insolvency regimes and limited crossborder fungibility of capital and liquidity within a single banking group as a result of ring-fencing measures by national competent authorities.

As it takes time for such obstacles to be removed, a faster means of achieving this goal would be for banks to rely more extensively on branches instead of providing services through subsidiaries. In this regard, ECB Banking Supervision has already brought forward important suggestions for facilitating the use of branches<sup>51</sup>.

Further steps are completing the ratification of the amendment of the Treaty establishing the European Stability Mechanism and creating a European deposit insurance scheme (EDIS). Regrettably, national sovereign safety nets remain the ultimate backstop for banks. This cements the sovereign-bank nexus that led the euro area into a deep crisis more than ten years ago.

Progress on risk sharing through EDIS needs to be accompanied by stronger market discipline to mitigate adverse incentives and make risk sharing more politically palatable<sup>52</sup>. Therefore, risk sharing and market discipline should be advanced in parallel.

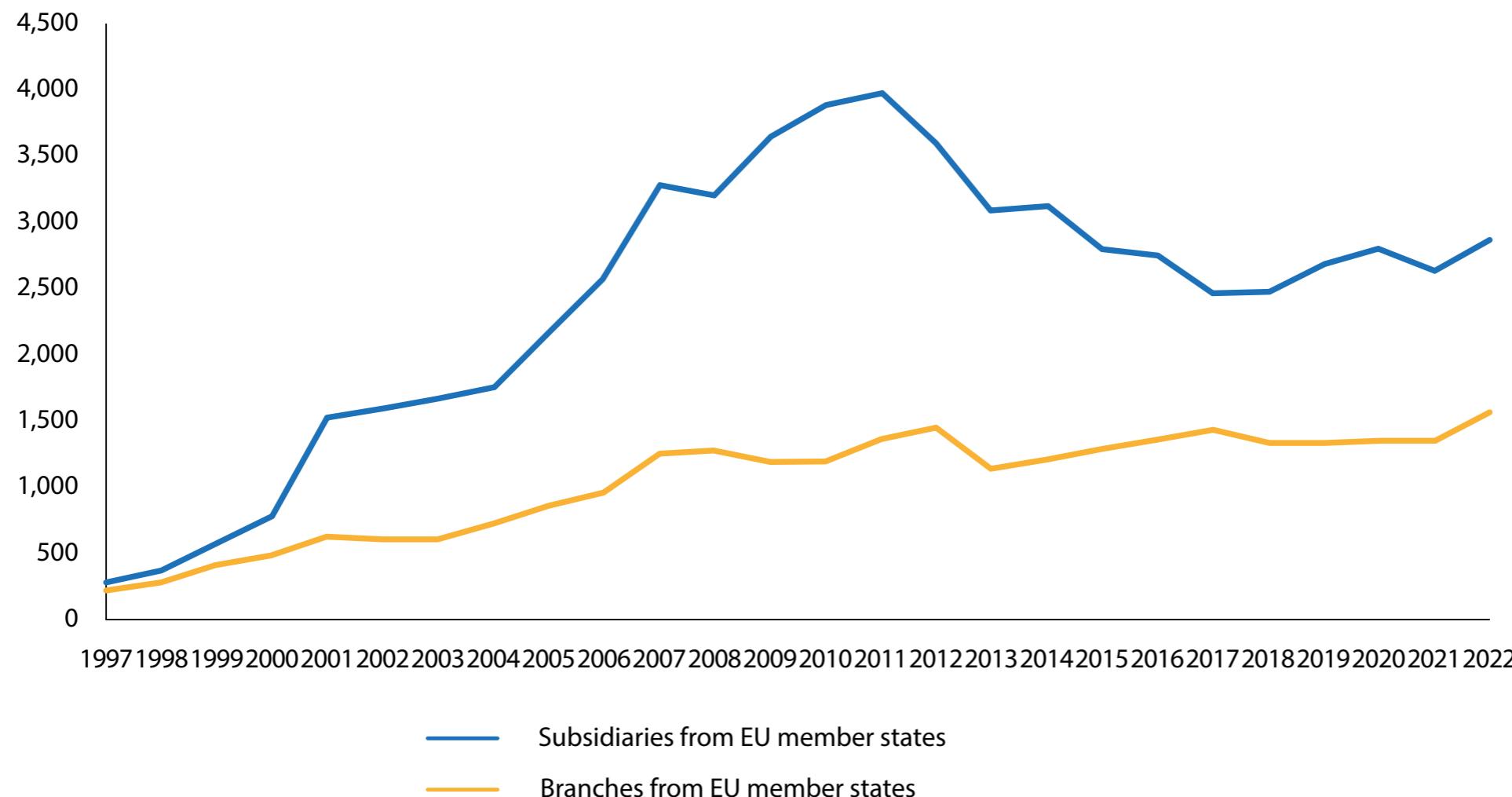
### **Raising public investment**

Third, we need to raise public investment, both at national and European levels, in order to deal with pressing

## Slide 14. European banking sector remains segmented along national borders

Total EU crossborder assets in the euro area

(Total assets, € billions)



Source: ECB Structural Financial Indicators.

structural challenges: the green transition, territorial security, digitalisation and a growing shortage of skilled workers.

Complementarities between public and private investments mean that capital deepening by firms alone will not be sufficient to overcome the euro area's competitiveness crisis<sup>53</sup>.

Public investment has been weak in the euro area for a long time. After the sovereign debt crisis, a visible gap in public investment opened between the euro area and the United States (Slide 15, left-hand side)<sup>54</sup>.

Against this background, the ECB welcomes the recent agreement in the European Parliament and the Council on a new economic governance framework that attempts to balance the need to ensure debt sustainability against incentives for investments and structural reforms. The latter are essential for raising productivity and economic growth, and therefore also vital in supporting debt sustainability.

Now governments must take full ownership of the new rules. Besides consolidation efforts, this means meeting the reform and investment commitments made in their national Recovery and Resilience Plans, which are at the heart of the Next Generation EU (NGEU) programme<sup>55</sup>.

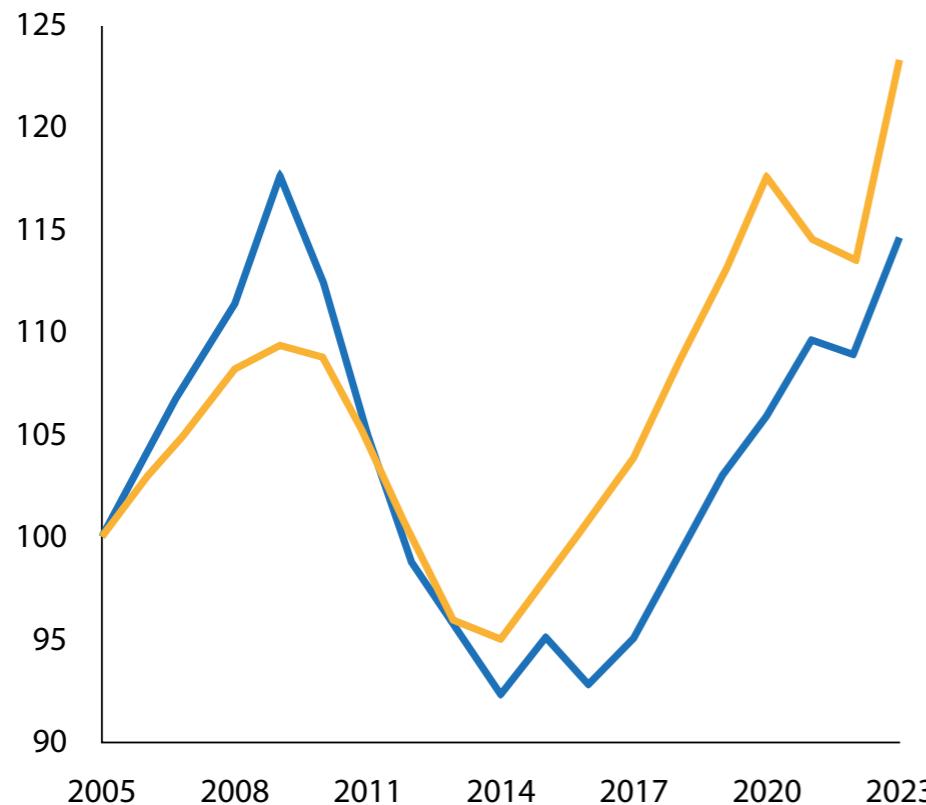
NGEU can play a significant role in overcoming the euro area's competitiveness crisis, as it allocates most of its funding to public investment, including in education and training<sup>56</sup>. For the euro area, financial support offered by national Recovery and Resilience Plans amounts to €513 billion, or almost 4.1% of euro area GDP<sup>57</sup>.

Estimates by ECB staff suggest that NGEU has the potential to measurably boost productivity growth over the coming years (Slide 15, right-hand side). However, this requires full implementation of previous commitments.

## Slide 15. Public investment can boost productivity growth and potential output

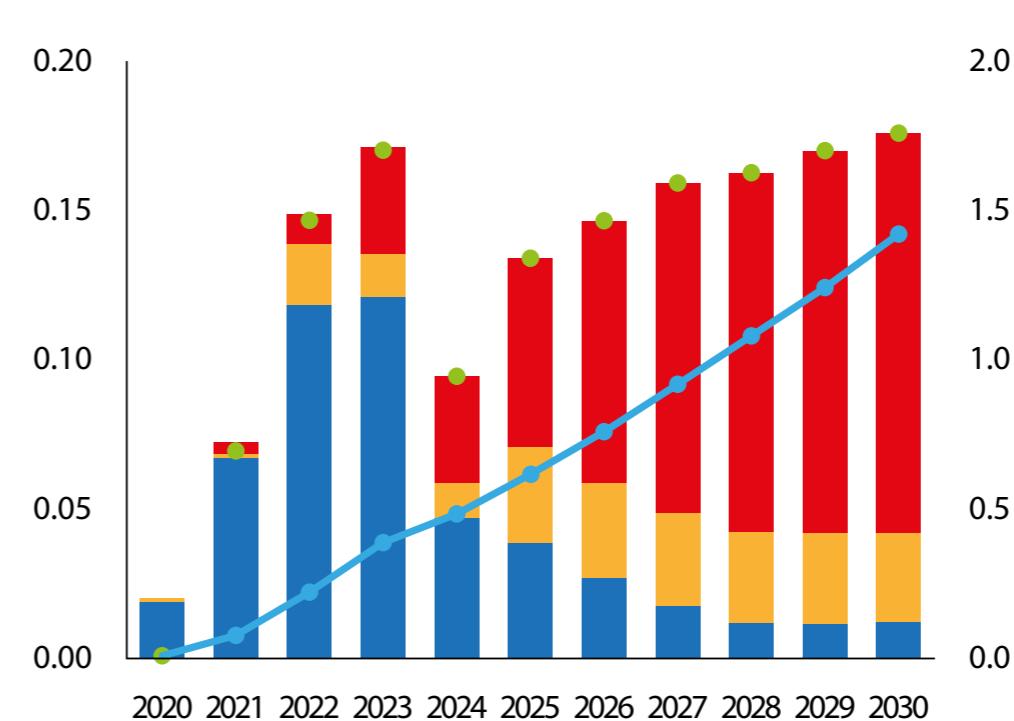
**Headline inflation in the euro area (HICP)**

(annual percentage changes)



**Impact of NGEU on potential output and growth of seven euro area countries**

(impact on level in percentages, on growth and contributions in percentage points)



● Potential growth (lhs)

■ Capital (lhs)

■ Labour (lhs)

■ Total factor productivity (lhs)

● Potential output level (rhs)

Ihs Notes: The 2023 figure for the Euro area is based on AMECO projections.

Latest observations: 2023.

Sources: European Commission (AMECO), Bureau of Economic Analysis and ECB staff calculations.

rhs Note: Countries included: DE, ES, FR, GR, IT, MT and PT.

Source: ESCB staff calculations (Bańkowski et al 2022).

Reforms and investments are being actively pursued across the EU. By the third quarter of 2023, around 500 reform-related milestones and targets had been assessed as satisfactorily fulfilled (Slide 16)<sup>58</sup>.

At the same time, despite a significant catch-up in December last year, the latest evidence points to some backloading in the implementation of investment plans. For the euro area aggregate, the latest estimates by ECB staff indicate a cumulative shortfall over the period 2021-2023 of around 4% in relation to the total funding that was initially available<sup>59</sup>.

The European Commission has published an independent evaluation report on the progress made on implementing investment plans so far. The delays highlight two potential areas for reflection on the way the Recovery and Resilience Facility (RRF) is designed.

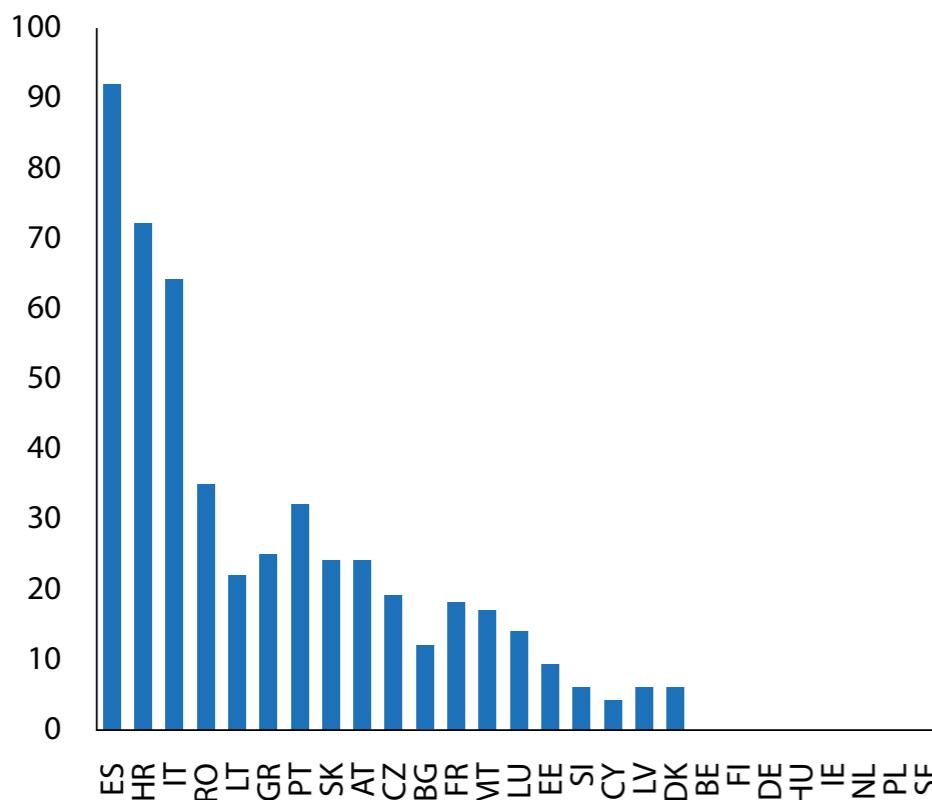
One is the administrative burden. The RRF regulation requires member states to set up an effective control and audit system. Such a system is important for protecting the EU's financial interests, but anecdotal evidence suggests that this system poses a considerable challenge for national administrations which has led to delays in payment requests. It is a trade-off that requires reassessment.

The other area for reflection relates to NGEU's ambitious horizon: all funds need to be tapped by 2026 the latest. While we have no time to lose when it comes to stimulating productivity and fighting climate change, rushing the implementation of investment projects could translate into supply bottlenecks, unwarranted demand-driven inflationary pressures and the risk of selecting 'easy-to-fulfil' projects that favour government consumption over investment.

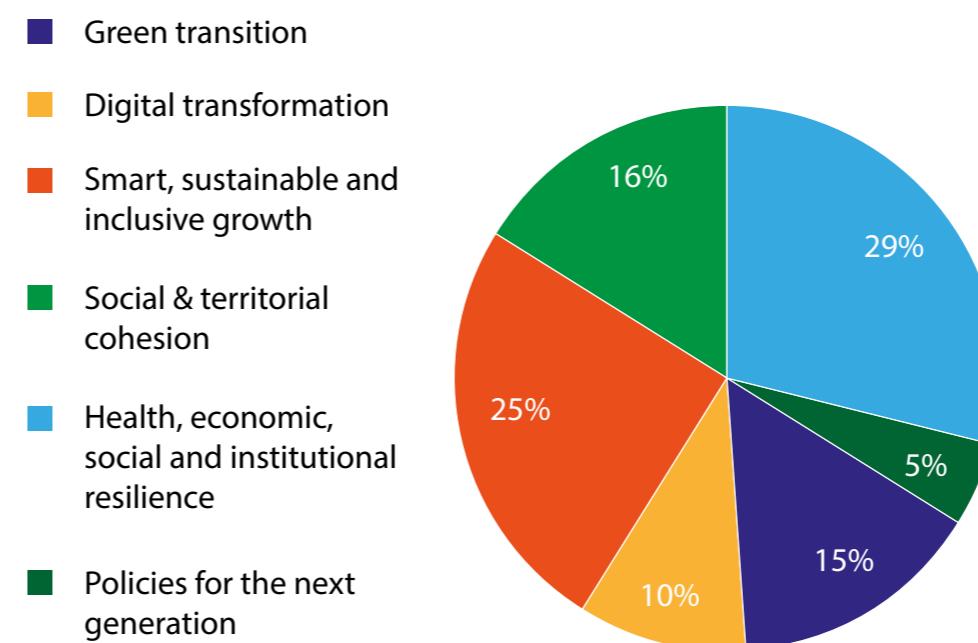
These issues demand attentive contemplation, as we cannot allow NGEU to fail. The stakes are simply too high, also for the ECB.

## Slide 16. Significant number of reform-related RRF milestones and targets already fulfilled

RRF milestones and targets: breakdown by country  
(total number)



RRF milestones and targets: breakdown by policy pillar  
(percent)



Ihs Note: Database accessed on 6 December 2023. A Milestone or Target is counted as fulfilled if the Commission has assessed it as being satisfactorily fulfilled. All EU countries included.

Source: ECB illustration based on European Commission data.

Ihs Note: Database accessed on 6 December 2023. A Milestone or Target is counted as fulfilled if the Commission has assessed it as being satisfactorily fulfilled. All EU countries included.

Source: ECB illustration based on European Commission data.

With NGEU, the euro area temporarily addressed three important gaps in its institutional architecture: (i) it set up a central fiscal tool to provide stabilisation through common resources, which supports monetary policy; (ii) it led to closer integration in economic policymaking by coordinating strategic investment decisions at the European level; and (iii) it increased the liquidity of EU bonds and it deepened euro area capital markets, thus making progress towards the creation of a truly European safe asset<sup>60</sup>.

How effectively governments use the NGEU funds to make our economies fit for the challenges we face will therefore critically define the future path of European integration.

Successful implementation of NGEU presents a unique opportunity to boost productivity, lay the groundwork for completing the euro area's institutional architecture and make monetary policy more effective.

### **Conclusions**

Nobel laureate Paul Krugman once noted "*Productivity isn't everything, but, in the long run, it is almost everything.*"<sup>61</sup>. European leaders recognised this already more than 20 years ago when they signed the Lisbon strategy. But progress has so far been disappointing.

Growing economic nationalism, threats to our territorial security and a rising technology gap between ours and other advanced economies make the case for boosting the euro area's competitiveness ever more urgent. The responses to the pandemic and the war in Ukraine demonstrate that Europe is able to pull together when faced with adversity.

Turning from laggard to leader requires initiating a virtuous circle between public and private investment on the one hand and productivity growth on the other. This starts with full implementation of previous commitments

under the Recovery and Resilience Facility. Priority must be given to measures that strengthen competition, reduce bureaucracy and stimulate further integration in product, labour and financial markets.

These measures will help channel capital and labour towards their most productive uses, challenging incumbents and removing barriers that are holding back young productive firms from growing to their full potential.

And, importantly, Europe leading the way on productivity also helps the ECB maintain price stability. ■

### **Isabel Schnabel is Member of the Executive Board of the ECB**

## Endnotes

1. European Commission (2023), [\*Flash Eurobarometer 538 – The euro area\*](#), November.
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56. As referred to in Article 3 of the Recovery and Resilience Facility Regulation, the facility's scope of application extends to policy areas of European relevance grouped into six pillars: i) green transition; ii) digital transformation; iii) smart, sustainable and inclusive growth; iv) social and territorial cohesion; v) health, and economic, social and institutional resilience; and vi) policies for the next generation, including education.
57. Based on 2021 euro area GDP.
58. This corresponds to roughly 20% of the amount envisaged over the full life cycle of the Recovery and Resilience Facility.
59. Most of the payment requests in 2023 were not submitted on time in accordance with the time frame agreed in the Operational Arrangements.
60. Bletzinger, T, Greif, W and Schwaab, B (2022), ["Can EU bonds Serve as Euro-Denominated Safe Assets?"](#), Journal of Risk and Financial Management, Vol. 15(11), pp. 1-13, November.
61. Krugman, P (1997), *The Age of Diminished Expectations*, 3rd edition, The MIT Press.

*This article is based on a [lecture](#) delivered at the European University Institute, Florence, 16 February 2024.*

# Accelerating strategic investment in the EU beyond 2026

The EU has to manage the climate and digital transitions and achieve greater economic resilience. Maria Demertzis, David Pinkus and Nina Ruer discuss the potential EU approach to funding strategic objectives

## Executive summary

The European Union's ability to meet its long-term objectives – primarily managing the climate and digital transitions and achieving greater economic resilience – will depend crucially on how much it invests and what it invests in.

For the two transitions, the EU member states collectively face a total annual investment gap of at least €481 billion up to 2030. Closing this gap, which is necessary if the EU is to achieve its strategic objectives, will rely on the efficient use of public resources and on mobilising private investment.

We discuss a potential long-term EU approach to the financing of strategic objectives. We define the notion of strategic investment in the context of the EU, set conditions for such investment to be (co-) financed at EU-level, and make recommendations about strategic investment in the EU beyond 2026.

We argue that EU (co-)finance would be justified if there is demonstrable EU value added, for example in the form of crossborder efficiency gains. The term 'strategic' would help prioritise how the EU pursues its economic and security interests.

Examples that would qualify as European strategic investments include energy and connectivity infrastructure with crossborder impact, and facilities that boost innovation and promote economic security and resilience at the EU level.

We examine various past and present EU strategic project financing programmes. We also survey national programmes to identify best practices in public investment management. We make the following main policy recommendations:

1. There is a lack of continuity in the way that the EU has pursued investments in that programmes have been finite and sporadic, with different sources of funding and overlapping objectives. We propose the creation of a dedicated and permanent fund for European Strategic Investments (ESIs), that can come in the first instance from a partly repurposed European budget (the Multiannual Financial Framework).
2. We argue that the European Investment Bank (EIB) would be the natural manager of such a fund. The fund itself should employ all the financial instruments at its disposal to finance projects. Projects should be evaluated in terms of how well they provide European added value and contribute to the EU's strategic objectives.
3. Beyond current financing means, the EU still needs to make progress on establishing new own resources, or revenues for the EU budget, to repay debt issued under the NextGenerationEU post-pandemic recovery instrument. At a later stage, a consequence of having established new own resources will be that the EU will then have additional dedicated financing streams that it could use for ESIs. This would ensure continuity in pursuing strategic objectives.

## **1 Introduction**

The European Union's ability to meet its long-term objectives, from managing the twin transitions (climate and digital) to greater economic resilience, and from security to promoting multilateralism, will depend crucially on how much it invests and in what.

The huge investment that has been identified as a prerequisite to move forward on some of these objectives will require the participation of the private sector and public authorities alike.

In this study, we explore the EU's role, beyond that of member states, in financing directly some of the strategically relevant projects.

A major objective for the EU economy is to remain competitive globally, without resorting to protectionist measures that go against the multilateral system.

A necessary ingredient to remaining competitive in a world of big players is to increase and maintain scale. Deepening and expanding the EU single market for goods and services are ways of promoting scale. European economies still operate with a considerable home bias that favours domestic firms over those that may reside even just over the border.

A bigger and deeper single market for goods and services is necessary for developing big firms that can compete globally, and for creating conditions for innovation and ensuring dynamism in the labour force.

Finance should play an important role in deepening the single market but when it comes to financial intermediation, there are no unified markets for banks and capital across the EU. Despite the creation of a banking

union, banks still operate predominantly within national borders. Making progress with completing the banking union would help move in the direction of a unified market that would increase the financing capacity in each country.

But bank finance also has its limits as it is not conducive to risk-taking (Demertzis *et al* 2021). To deal with these risks, the EU must develop deeper and more unified capital markets to finance riskier projects.

*The EU can play an important role in making sure that the necessary investments in energy and transport systems are done by all countries, while also safeguarding a fair transition*

In the meantime, the lack of such risk finance means that the public sector must absorb some of the risk associated with delivering on longer-term and less-certain investments. Some of these investments may be strategic in nature. As not all countries have the same fiscal capacity, they may opt to pursue some of these European strategic objectives at different speeds.

This can be problematic. Pursuing, say, climate goals at different speeds may compromise the ability of all countries to achieve important milestones. This is why we see an important role for the EU to ensure that all countries advance at a minimum acceptable speed, at least for some of the most important European public goods, such as climate or connectivity.

With European elections in 2024, this is a natural point for the EU to reflect on its long-term strategy, including on how to invest beyond 2026, the year when the new European budget will have to be agreed and the NextGenerationEU initiative (NGEU) comes to an end.

We define the notion of strategic investment in the context of the EU, set out conditions for such investment to be co-financed by the EU and make recommendations about what these should be in the EU beyond 2026. We present first the EU's main long-term objectives, in the context of the challenges it faces. All member states and the EU as an entity will have to plan how to accelerate investment to meet these objectives.

We discuss the rationale for EU-level financing of some of these objectives, alongside private sector and member state financing. EU involvement would necessarily require there to be value added, for example in the form of crossborder efficiency gains, in pursuing some of these long-term objectives.

This is necessary on economic grounds and is also crucial for democratic legitimacy and acceptability. Having identified projects that offer such efficiency gains, the EU needs to prioritise those that are strategic – in other words, pivotal to the EU’s economic interests and economic security.

We look at the EU’s previous efforts to finance long-term projects using funds from the European budget (Multiannual Financial Framework, MFF) and the newly established NGEU. We observe a lack of continuity in the instruments used to pursue these objectives as programmes span at most seven years and typically between three and five.

Also, multiple institutions oversee different programmes that sometimes have over-lapping objectives. Additionally, we look at how countries have used public investments to advance their own objectives, as a way of identifying best practices in terms of maximising the impact of public resources.

We make two main contributions in this study. First, we define strategic investment in the context of the EU and set out conditions identifying when to finance projects with EU resources. Strategic investment, in the form of gross fixed capital formation, is investment consistent with the EU’s long-term objectives and priorities.

We discuss when there is a good case for the EU to finance some of these strategic objectives directly, beyond what EU countries and the private sector do. When EU ‘additionality’ is established, it means that projects will be underprovided if left to countries or the private sector alone. Crossborder efficiency gains would be one example of a justification for EU financing.

Second, we formulate recommendations on how to think about European strategic investments, grouped into three categories:

1. Reform current funds and tools. The EU's previous attempts to finance projects of strategic relevance have been characterised by a series of time-limited programmes. Such funds are finite in that they last only a few years, they come from different sources of funding, and they often overlap. We propose creating a dedicated fund for European Strategic Investments (ESIs).

The priorities in terms of achieving long-term objectives need to be evaluated periodically. Such continuity will require dedicated funds that can come in the first instance from a partly repurposed European budget (the MFF).

2. Put the European Investment Bank in charge. A dedicated fund will also require a dedicated manager. We argue that the EIB is the natural manager for such a fund. Financial support should be distributed on a project-by-project basis once the European added value has been established.

The EIB has the resources and skills to evaluate complex and technical projects and can build tools for transparent monitoring of projects.

3. Work towards new funding tools. The EU still needs to make progress with finding new 'own resources' to finance the debt it has issued under NGEU. At a later stage, a consequence of establishing new sources of income for the EU budget will be that the EU will have dedicated financing streams for ESIs as a way of ensuring continuity.

As ESIs are relevant to all EU citizens of current and future generations, they are a prime candidate to be financed by common EU resources and through long-term debt.

## **2 The EU's long-term objectives and the role of public investment**

In this section, we identify the long-term objectives the EU has set for itself. Then we summarise some of the budgetary needs that have been identified in the literature and discuss the benefits of public investment, as described by the literature.

### **2.1 The EU's long-term objectives**

As is the case for any investment, strategic investment needs to be consistent with a set of long-term objectives. This is necessary to ensure consistency in the way investments are selected and implemented.

European strategic investments should therefore be consistent with the long-term objectives set at EU level. Based on European Commission publications, we group high-level EU objectives into the following five groups.

#### **1. Open strategic autonomy and competitiveness**

The European Commission Joint Research Centre's 2023 strategic foresight report (Matti *et al* 2023, p. 30) states that "*Open strategic autonomy refers to the EU's objective of strengthening independence in critical areas, supporting the EU's capacity to act, while being open to global trade and cooperation.*"

Open strategic autonomy became an important topic initially after the first supply chain interruptions during the pandemic, and later with the increased geopolitical tensions globally following the Russian invasion of Ukraine.

The objective of competitiveness refers to strengthening Europe's global competitiveness. The EU needs to identify the conditions that will allow its industries to promote sustainable growth internally and to compete in global markets.

It is particularly important to ensure that new legislative proposals and high-level projects, such as the Twin Transition (see below), do not harm the region's competitiveness. Fostering EU leadership in technology and cybersecurity have also been highlighted as crucial to ensure European competitiveness on the global stage.

## 2. Twin transition

EU policymakers employ the concept of the 'twin transition' when talking about transforming EU economies into more environmentally sustainable and more digitalised systems. The objectives of the landmark European Green Deal were set out in the European Commission's priorities for 2019-2024<sup>1</sup>.

They are: (i) no net emissions of greenhouse gases by 2050, (ii) economic growth decoupled from resource use, and (iii) not leaving any citizens behind in the transformation.

The digital transition aims to prepare businesses and citizens for the increasing importance of digital technologies. Building the necessary infrastructure to take advantage of new technologies is part of the 'European Digital Decade', as is enabling citizens to participate in transforming labour markets through reskilling. Ensuring proper and safe development and use of artificial intelligence is also part of this objective.

## 3. Resilience and economic and territorial cohesion

The 2020 Strategic Foresight Report (European Commission, 2020a, p. 3) defined resilience as "*the ability not only to withstand and cope with challenges but also to undergo transitions in a sustainable, fair, and democratic manner.*"

This objective aims to prepare Europe for future economic, social and health shocks. Recently the concept has been captured by the notion of de-risking, which refers to the reduction of extreme dependencies on

critical goods and promotes EU economic security. Fostering the resilience and strength of health systems in the EU is also part of this objective.

Economic and territorial cohesion refers to strengthening the internal cohesion of the EU, including efforts to address imbalances between countries and regions. The goal is to achieve a level playing field inside the EU for all economic players and to preserve the integrity of the single market. In the process, it is important to provide equal opportunities to all citizens across all regions.

#### 4. Security and European values

The European Council listed “*protecting citizens and freedoms*” as part of its 2019-2024 agenda (European Council, 2019). The relevance of this theme has only increased with the Russian invasion of Ukraine. This objective includes securing the EU borders and ensuring the security of supply chains. Defending and promoting European values, such as ensuring and strengthening democracy and protecting the rule of law, is a key EU objective.

#### 5. Open markets and rules-based multilateralism

Europe’s relationship with the rest of the world is defined by adherence to rules-based multilateralism and open markets. Supporting and cooperating with other regions and economies to achieve common goals, such as the twin transitions, is also part of this objective.

The Global Gateway facility – with an objective of investing internationally in high-quality and sustainable infrastructure to foster development and growth in partner countries – is an example of such a policy<sup>2</sup>.

## 2.2 European budgetary needs

The European Commission has identified a series of budgetary needs to be met for the EU to meet its long-term objectives. These span several areas. A non-exhaustive list includes:

1. Climate and energy transition. Pisani-Ferry *et al* (2023) reported that for the EU to achieve a 55 percent emissions reduction by 2030, compared to 1990, it will need annual additional investment (compared to investment levels from 2011 to 2020) amounting to about 2 percent of GDP (€356.4 billion).

This represents investment in energy and transport systems. Pisani-Ferry *et al* (2023) also estimated that when it comes to the green transition, annual public investment is expected to be within 0.5 percent to 1 percent of GDP in the future (see also Darvas and Wolff, 2022). A substantial part of the gap will need to be filled by the private sector.

Lenaerts *et al* (2021) reported similar numbers that go beyond 2030 and studied how to reach climate neutrality by 2050. More specifically, achieving the benchmarks set forth in the 'Fit for 55' package – a body of EU laws facilitating the reduction of net EU greenhouse gas emissions by at least 55 percent by 2030 compared to 1990 – would demand annual investment of approximately €487 billion for the energy sector and €754 billion for the transportation sector from 2021 to 2030.

Additionally, REPowerEU, a programme put together after the Russian invasion of Ukraine to increase the EU's energy resilience by decoupling from Russian fossil fuels, entails total investment of €210 billion between now and 2027 (European Commission, 2022a).

2. The digital transition. Bridging the investment gap within the EU for the digital transition will entail a minimum annual expenditure of €125 billion between 2020 and 2030 (European Commission, 2020b).

According to Papazoglou *et al* (2023), the principal EU funding instruments – the Recovery and Resilience Facility (RRF), the Connecting Europe Facility 2 (CEF2) Digital, the Digital Europe Programme, Cohesion Policy and Horizon Europe – will contribute a total of over €165 billion up to 2027 to support the Digital Decade targets, to be achieved by 2030<sup>3</sup>.

More than 70 percent of these funds will come from the RRF. Ockenfels *et al* (2023) estimated an overall investment gap of at least €174 billion to meet just two of the twelve Digital Decade targets (specifically the fixed Gigabit coverage and providing ‘full 5G service’). Again, they argue that the private sector will have to play a major role to fill this gap.

3. Defence and security. The financial implications of the new geopolitical landscape are also substantial. Defence spending by EU countries reached €214 billion and €240 billion, in 2021 and 2022 respectively (European Defence Agency, 2023). This marks the eighth year of consecutive growth in defence spending. Several EU countries still fall short of their NATO obligation of military spending of 2 percent of GDP.

4. Reconstruction of Ukraine. The reconstruction efforts in Ukraine will necessitate a collective contribution of €384 billion from all partners over the next decade (World Bank, 2023). This amount will increase in line with the duration of the war, and it is also expected that the private sector will bear a part of that.

In 2021, the Council of the EU approved the establishment of the European Peace Facility (EPF), with a current financial ceiling exceeding €12 billion. The EPF aims to prevent conflicts, promote peace and enhance international security.

In October 2022, the EU Military Assistance Mission in support of Ukraine (EUMAM) was formed with the purpose of providing individual, collective and specialised training to Ukraine's Armed Forces, and to coordinate and synchronise the activities of member states delivering this training.

5. Health Union. Similarly, an EU4Health programme with a budget of €5.3 billion was put together in 2021 for the period 2021-2027 to advance the EU's health policies, towards a European Health Union, intended to ensure collective preparation for, and response to, health crises<sup>4</sup>.

Amounts stated above include both investment and spending needs, as it is often not possible to separate the two. From 2021 to 2027, EU spending power is just over €1800 billion, of which €1050 comes from the MFF and €750 billion from NGEU. This amounts to an average of €257 billion in annual spending power.

This average annual total spending power falls significantly short of the €356.4 billion in additional annual investment needed for the green transition alone, as estimated by Pisany-Ferry *et al* (2023). Even if the EU were to spend its entire budgetary resources only on the green transition, it would fall very short of what is needed.

And that is only one of the EU's objectives. This is why many voices have called for private investment to be mobilised to help achieve the EU's objectives.

EU policymakers recognise the importance of maximising crowding-in of private capital for strategic projects. This was a central aim of two EU investment programmes: the investment plan for Europe (the so-called 'Juncker Plan') and InvestEU (see section 4.2 for details of these programmes).

These two initiatives were established in 2015 and 2021, respectively, to increase overall investment levels in the EU. EU initiatives need to be careful to maximise the impact of the limited resources, including by avoiding the crowding-out of private-sector investment. Instead, private investment should be facilitated by EU actions.

These include participating in the financing of projects, by picking up the risk tranches that the private sector is reluctant to take on, reducing red tape and unifying regulatory frameworks for infrastructure. The scarcity of resources also underlines the importance of well-designed allocation mechanisms and the prioritisation of objectives.

EU countries have a crucial role to play by deploying public funds to help finance investments of strategic relevance for the EU. But not all countries have the same ability to play a role in this regard. Darvas *et al* (2023a) reported that the European Commission projects that 18 of 27 EU countries will have either a debt level above 60 percent of GDP or a budget deficit above 3 percent of GDP in 2024, which under the old fiscal framework<sup>5</sup> would trigger the EU excessive deficit procedure (EDP).

The EDP was suspended in 2020 because of the COVID-19 pandemic but its reinstatement is planned in 2024. A reform of the EU fiscal framework agreed at the end of 2023 requires from EU countries very ambitious fiscal adjustment of more than 2 percent of GDP over the medium term, in addition to what had already been planned for 2023-24 (Darvas *et al* 2023b).

In addition, there is also the issue of the speed at which countries are asked to reduce debt, which will constrain some countries even further in the medium term (after countries have brought their deficit below the level of 3 percent of GDP).

Budgetary limitations and the need to reduce high levels of debt will directly affect the ability of countries to undertake strategic investments at national level. Part of the rationale for pursuing certain ESIs at EU level is based on the need for all member states to advance at a common minimum speed to ensure that EU long-term objectives are not threatened by lack of progress in individual countries.

Tighter fiscal rules might lead countries to cut back on investment support, increasing the importance of a well-defined framework for EU strategic investments.

Given the importance of the issue of how to finance the EU's objectives, the discussion goes beyond the two main current tools, the MFF and NGEU, and touches on the wider issue of EU fiscal capacity.

One possibility is to pool resources at EU level, in other words to establish a stream of additional 'own resources' that can be used to fund, among other things, strategic investments. For the moment the discussion on own resources is motivated by the need to repay NGEU borrowing, which involved the largest EU bond issuance in its history.

As a one-off instrument however, own resources are also finite. We argue that if permanent new income streams were to be established, then ESIs would be the next natural candidate item to be funded through vehicles other than the MFF.

European Commission (2021) proposed three new sources of revenue for the EU budget: 1) the EU emissions trading system, 2) the Carbon Border Adjustment Mechanism (CBAM), and 3) taking an allocation from member state taxes on the largest multinational companies.

The European Parliament supports these three sources of revenue and has asked the Commission to also explore several other potential sources as a basis for own resources, including corporate taxation (derived from a aggregation of the corporate tax base in the EU, as put forwards in the Business in Europe: Framework for Income Taxation (or BEFIT proposal), a tax on cryptocurrencies, a tax related to the digital economy, a financial transactions tax (FTT) and an EU ‘fair border tax’ (European Parliament, 2023a).

In a February 2023 resolution, the European Parliament (2023b) urged the Commission and member states to make progress on adopting an FTT to help the EU boost its industrial competitiveness and other policy priorities.

To that we would add the point that temporary issuance of debt for the RRF meant that the EU did not benefit from its full potential (Claeys *et al* 2021). Even though the European Commission followed the diversification practices of big issuers, the markets still priced a premium on this debt over and above what fundamentals justify.

This was a consequence of: i) the issued volume being small and therefore not fulfilling the purpose of issuing a significant new safe asset, and ii) the issuance being presented as a one-off event, thus making it less attractive to investors. A permanent stream of own resources would lead to more favourable issued debt by the EU than now.

Last, the intergenerational nature of ESIs makes a case for financing them with intertemporal means, such as long-term debt issued by the EU. Naturally, other instruments than debt issuance should also be considered (Helm, 2023).

### 2.3 The macroeconomic impact of public investment

The role of public investment in promoting economic growth has been studied extensively in the literature. The consensus is that public investments have a positive multiplier effect on the economy, but the magnitude of this

multiplier effect varies depending on the economic situation, the composition of investments and the economy's absorption capacity.

Public investment is seen as a potential driver of long-term growth by catalysing private sector investment and by enhancing productivity by modernising infrastructure, stimulating innovation and promoting education.

Moreover, public investment can play a crucial role in stabilising the economy by mitigating the negative effects of economic contractions. The EU Recovery and Resilience Facility (RRF) offers a good example, having the objective of supporting investments in the twin transition during a severe recession when public resources were very limited.

By helping to sustain the course on meeting long-term targets, the RRF has relieved national budgets and allowed countries to deal with the serious contraction during the pandemic.

Based on the literature, we summarise next the effects of public investment on the macroeconomy.

### *2.3.1 Impact on economic growth*

Public investment in infrastructure and education has played a central role in growth and poverty reduction strategies designed by many developing countries in recent decades (United Nations, 2020). This role is only likely to increase in importance in a post-COVID-19 world as countries seek to restore pre-pandemic growth rates and repair the scarring effects that lockdowns and closures have inflicted on human capital (Agarwal, 2022; Larch *et al* 2022).

There is a substantial body of work that seeks to quantify the macroeconomic effects of such investment efforts and its financing (Atolia *et al* 2021; Gurara *et al* 2019; Zanna *et al* 2019).

An increase in public investment can affect economic growth in two ways. First, an increase in public investment has positive effects on aggregate demand. Second, efficient public investment can contribute to the economy's productive capacity by increasing the stock of public capital.

However, it is important to consider the costs and benefits of additional public capital carefully, taking into account the financing alternatives and their effects on output and public finances. Considerable uncertainty surrounds the size of short-term fiscal multipliers.

They are, for example, larger during recessions, but found to be smaller in the presence of weak public finances, particularly when debt sustainability is at risk. In addition, multipliers depend on how the expenditure is financed, through debt, increases in revenues or cuts to other expenditure categories.

Empirical estimates of the effect of public capital on output tend to be positive but variable (Romp and De Haan, 2007). Studies by Barro (1988) and Aschauer (1989b) found that increases in public capital, such as infrastructure investment, have a positive impact on long-term economic growth by contributing to the economy's productive capacity.

Meta-analyses reveal an average long-term elasticity ranging from 0.12 (Bom and Lighthart, 2014) to 0.16 (Nuñez-Serrano and Velazquez, 2017) for public capital. Thus, for every 1 percent increase in public capital, long-term output tends to increase by somewhere between 0.12 percent to 0.16 percent, which is far below Aschauer's (1989b) estimate of 0.39 percent.

Abiad *et al* (2016) found positive and significant effects of public investment on output for advanced economies, both in the short-term and long term. For low-income developing countries, Furceri and Li (2017) found a

positive effect of public investment on output in the short and medium terms. Ramey (2021) underlined the macroeconomic perspective on government investment, offering robust evidence in favour of the enduring advantages of infrastructure expenditure.

### ***2.3.2 Impact on productivity, job creation and inequality***

One of the primary channels through which public investment affects economic growth is by enhancing productivity. Infrastructure investment, such as roads, bridges and telecommunications networks, reduce transportation costs and improve the overall efficiency of the economy (Munnell, 1990).

Public investment also plays a vital role in job creation. Investment in infrastructure projects generates employment opportunities in construction, engineering and related industries. Cingano *et al* (2022) evaluated a public investment subsidy programme in Italy. Under this scheme, funds were allocated through calls targeting different sectors, primarily in industry. The main objective of this policy was job creation.

The authors found that the policy induced the desired behavioural response in terms of job creation: firms benefitting from the programme increased investment by 39 percent and employment by 17 percent over a six-year period, compared to similar firms not eligible for the subsidy.

Infrastructure investment can have an impact on income inequality beyond its effect on aggregate income. Infrastructure can improve the access of the poor to services and productive opportunities. It can also improve access to human capital.

Infrastructure can also support the integration of poor and marginalised communities into the wider society and economy (Calderón and Servén, 2014). Empirical evidence indicates that infrastructure development and access

is negatively correlated with various measures of inequality, although with some measurement limitations (for an overview see Calderón and Servén, 2014). While the evidence on infrastructure and inequality is limited, the impact on inequality should be taken into account when planning infrastructure projects.

### ***2.3.3 Differences between countries and investment types***

The effectiveness of public investment is shown to depend on a country's level of development, institutional quality and governance. Governance of the public investment process affects the macroeconomic effects of public investment in different ways (Miyamoto *et al* 2020).

Countries with stronger governance achieve a stronger output impact of public investment. Stronger infrastructure governance<sup>6</sup> helps public investment yield a higher growth dividend by improving investment efficiency and productivity, and it stimulates private-sector investment.

By contrast, weak infrastructure governance is shown to crowd out private investment, lead to higher debt-to-GDP ratios and cause significant waste of public money, all of which have a negative impact on output, even after sizeable public investments.

Moreover, the type of investment matters. While infrastructure, education and healthcare investments are all recognised as having positive effects on output, the effect varies in magnitude (Ramey, 2021; Atolia *et al* 2021).

Holmgren and Merkel (2017) performed a meta-analysis of the relationship between infrastructure investment and economic growth. They found significant variance in the effect of infrastructure investment on production.

Specifically, the estimated effects of a one percent increase in infrastructure investment range from a 0.06 percent decrease to a 0.52 percent increase in output. The effects appear to vary depending on the type of infrastructure in which the investment is made, and the type of industry.

A more recent line of research indicates that investment multipliers are more pronounced for green investments. According to Batini *et al* (2022), spending on clean energy, such as solar, wind or nuclear, exerts a GDP impact approximately two to seven times greater (depending on the technology and timeframe analysed) than spending on non-environmentally friendly energy sources, including oil, gas and coal.

Afonso and Rodrigues (2023) studied the impact of public investment in construction and R&D in 40 countries, notably on economic growth and on crowding-out effects on private investment. They compared the effects of these investments in emerging and advanced economies by controlling for the level of economic development.

They found that: i) innovations in public investment have more positive effects on GDP growth and private investment in emerging economies; ii) the positive impulse of public investment on the private sector is pronounced and significant in emerging economies; iii) government construction investment has a more positive effect on economic growth in emerging economies; iv) innovations in public construction crowd out private investment spending in advanced countries; v) emerging economies benefit from public R&D investment.

Two recent, timely papers (Kantor and Whalley, 2023; Gross and Sampat, 2023) showed that public R&D may have large effects locally and also at the aggregate level. Both papers examined episodes of applied public R&D ‘moonshots’: the US government’s massive R&D effort during the Second World War and the US Apollo mission in the 1960s that culminated in the moon landing. In both cases the level of public investment was massive.

Bloom *et al* (2019) discussed several of the main innovation policy levers and described the available evidence on their effectiveness: tax policies to favour research and development, government research grants, policies aimed at increasing the supply of human capital focused on innovation, intellectual property policies and pro-competitive policies.

They brought together this evidence into a single-page ‘toolkit’, in which they ranked policies in terms of the quality and implications of the available evidence and the policies’ overall impact from a social cost-benefit perspective. The authors found that, in the short term, R&D tax credits and direct public funding prove most impactful.

However, increasing the supply of human capital yields greater effectiveness in the long run. Additionally, while competition and open trade policies may offer somewhat modest benefits for innovation, they are cost-effective.

In conclusion, there is general agreement that public investment can play a positive role in economic growth and the achievement of policy objectives. However, the effective implementation of these investments and their alignment with economic and policy priorities are pivotal to their success.

### **3 Defining European strategic investments**

The term ‘strategic investment’ is used often but very seldom defined. In his award-winning book *Chip War*, Chris Miller (2022) quoted a Reagan Administration economist who, in response to the multiple Silicon Valley requests for support for the semiconductor industry, invoking its strategic relevance, stated: “*Potato chips, computer chips, what’s the difference? ... They are all chips. A hundred dollars of one or a hundred dollars of the other is still a hundred.*”

The quote illustrates the lack of a common definition of the notion of ‘strategic’. Is strategic something that you cannot do without, or is it something that aims to achieve long-term objectives, or possibly both, or something else entirely?

According to the Cambridge Dictionary, the term strategic refers to investments made by a company with the intention of enhancing its long-term success. This might involve investing in a new business that offers access to new markets or developing innovative products.

Milgrom and Roberts (1992) defined strategic investments as investments that benefit the entire organisation, not just the specific unit making the investment decision. These investments are crucial for businesses as they can lead to competitive advantages through cost reduction and product differentiation, ultimately creating value (Porter, 1980; Makadok, 2003). These definitions from the business context have only limited application to a policy context.

A common theme in these definitions is the emphasis on long-term impact. Strategic investments are typically seen as financial commitments made with a focus on creating long-term value, rather than seeking short-term returns. In essence, they involve allocating financial resources to projects, assets or initiatives aimed at achieving specific long-term objectives and strengthening an organisation's competitive edge.

Closer to the policy context is the concept of strategic investment funds. Divakaran *et al* (2022) defined such funds as having six attributes: i) they are initiated and (partially) capitalised by governments or quasi-sovereign institutions, ii) they invest primarily in unlisted assets and aim to achieve financial returns as well as pursue policy objectives, iii) they aim to mobilise co-investment from private investors, iv) they provide long-term, patient capital (mostly, but not exclusively, equity), v) they operate as professional fund managers seeking financial returns for their investors, and vi) they are investment funds established as separate legal structures.

Looking at the EU's past efforts labelled as strategic investments, this definition is only a partial fit. In particular, achieving financial returns has not been a major objective of some of the main strategic investment initiatives in the EU.

### 3.1 European strategic investments: a working definition

Bringing together insights from the literature, and international and EU experiences with strategic investment, we define 'European strategic investments' (ESIs) as follows:

*Investments, defined as gross fixed capital formation, carried out at the national or EU level are ESIs if they are consistent with the EU's long-term objectives and priorities<sup>7</sup>.*

The term 'strategic' must provide a rationale for prioritising investments and therefore the order in which long-term objectives are pursued. European strategic investments can be financed by the private sector, by EU countries or with EU financing. Therefore we supplement our definition with:

*The decision to (co-)finance some of these ESIs at the EU level additionally requires that those investments are European public goods (EPGs). This means that there is added value to be had by pursuing investment at the EU level instead of solely at member state level.*

Not all European public goods are investments as some might refer to consumption, for example, common procurement of vaccines. Equally, not all investments that are EPGs are necessarily strategic, in other words, of the highest priority.

In this paper, we only focus on ESIs that merit EU financing according to the thinking just described. However, the objective is to encourage the participation of both the private sector and member state governments. The remainder of this section discusses the concepts of EPGs and 'strategic' in more detail.

### **3.1.1 What are European public goods (EPGs)?**

A starting point for the provision of any public good is the presence of a market failure that prevents the private sector from taking up a specific economic activity. In the presence of externalities, a good or service either will not be provided or will be underprovided by the markets.

For EPGs, there is also a failure at the national level, in that a good or service will not be provided or will be underprovided if EU countries are left to provide for it individually.

The concept of EPGs encompasses the concept of additionality that is cited in the regulations that underpin many EU investment instruments. Additionality means that EU financing does not displace financing from any other source.

In other words, the additionality principle states that the project would not be realised, or not to the same extent, without EU financial support. Importantly, efficiency gains such as shorter delivery times or lower cost can also satisfy the additionality principle.

Fuest and Pisani-Ferry (2019) justified the provision of a public good at the EU level when the benefits of doing that exceed the benefits of providing it at member state level. Such added value could come from economies of scale, crossborder spillovers and similarity in country preferences and interests.

Efficiency gains at the EU level would come either through crossborder spillovers or through cost-savings arising from economies of scale if a good is financed at the EU level rather than separately by each country. Buti *et al* (2023) argued that providing EPGs could strengthen cohesion across countries and, therefore, also benefit the EU as a political entity.

Since the COVID-19 pandemic crisis and then the energy crisis following the Russian invasion of Ukraine, the discussion on market failures has broadened to include not only the under-provision of a good or a service, but also the issue of underinvestment in resilience (Grossman *et al* 2023).

The idea here is that firms themselves might be individually sufficiently diversified in how they organise their supply chains, for example, but sectors might not. This could make a sector vulnerable and could, if economically systemic, pose a significant risk to a whole country's 'business continuity'.

Public intervention is then justified as a way of internalising this systemic vulnerability. The rationale suggests that if efficiency gains are achievable at the EU level, say because of crossborder spillovers, conducting this public intervention at the EU level is most fitting.

An example of such a vulnerability that unravelled was relying entirely on imports for the provision of face masks at the start of the pandemic, a good that was critical for safeguarding public health.

The question then is, what public goods can achieve efficiency gains if provided at the EU level? Buti *et al* (2023) identified six areas where EPGs exist: digital transition, green transition and energy, social transition, raw materials, security and defence, and public health.

These public goods could include both investment (for example in infrastructure) and consumption (as the joint purchase of face masks), or could require joint action at EU level (for example procurement). In our definition of European strategic investments that are eligible for EU financing, we thus only include EPGs that refer to investments.

### **3.1.2 When is an investment strategic?**

A common theme that underpins all definitions of strategic investment is the need to respond to long-term objectives. However, long-term investment has been challenged in the past 15 years with the world economy hit by extreme shocks that originated in very different geographies and parts of the economy.

Extreme events now occur seemingly more often, and it is no longer safe to assume that similarly severe shocks will not continue to occur. A financial crisis, followed by a pandemic and more recently the Russian invasion of Ukraine that has forced the EU to reconfigure its energy relationships, all in the space of 15 years, has meant that investments have had to be delayed or re-prioritised to deal with urgent issues.

In response to these three extreme shocks, the EU has had to redefine its priorities. The financial crises required the EU to invest in strengthening its institutional power to monitor and safeguard its banking sector.

The pandemic required protecting the economic value of households and firms, prioritising the financing of critical goods such as vaccines and reassessing the length of international supply chains. The energy crisis has forced the EU to change its energy mix and rethink how it can secure its energy supply.

Arguably, some of the investments made in fossil fuels in the EU to ensure energy security (such as in liquid national gas terminals or the re-opening of coal mines) can be understood as an example of reprioritising the objective of energy security above climate objectives, at least in the short run. No one could doubt that such investments were of strategic relevance to the EU's interests.

Nevertheless, adhering to long-term objectives remains crucial in the process of identifying strategic investments. The challenge for policymakers in identifying and pursuing ESIs is to navigate the high levels of uncertainty present while remaining consistent with a long-term vision.

### 3.2 Examples of European strategic investments

A non-exhaustive list of projects that are ESIs potentially qualifying for EU financial support under our definition would include<sup>8</sup>:

**Energy infrastructure and projects boosting energy efficiency, especially crossborder projects.** These include power plants, power grids and energy-storage facilities. There is a strong case for EU action since reaching the EU's climate goals depends strongly on the European energy mix and the infrastructure to transfer energy across the Union. The actions of a single country will benefit or harm the global climate, and therefore have direct implications for other EU countries.

Projects with a direct crossborder element, such as crossborder grids or grid interconnectors, could particularly benefit from EU action. While not necessarily constituting infrastructure, projects to boost energy efficiency, such as the refurbishment of buildings, would also qualify as being of EU value added.

**ICT infrastructure, especially crossborder projects.** This category includes infrastructure needed to connect European citizens within and across borders. Examples would be the 5G rollout or the development of optical fibre networks. Fast internet connections are becoming increasingly important for European competitiveness. Ensuring the continuity of services across borders would benefit the EU as a whole and justify EU action.

**Transport infrastructure, especially crossborder projects.** This category includes projects that physically connect European citizens and goods, as well as connections with the rest of the world, for example, roads, railways and ports. EU support is justified particularly for crossborder projects or facilities on important

European transport axes. Projects that aim to make transport more sustainable, such as electric-vehicle infrastructure or sustainable urban transport infrastructure, should also be considered.

**Facilities enhancing economic security and resilience.** Within this category are essential facilities that, if absent, would pose a threat to the EU's economic security and autonomy. An example of such critical industries would be critical raw materials or semiconductors.

When it comes to economic security, the EU needs to consider strategic investments as part of the broader aim of diversifying its sources of supply. The objective is not to eliminate dependencies but to safeguard business continuity through a mix of international trade and domestic production.

**Facilities and projects boosting innovation.** Research and development infrastructure and projects with an expected significant impact on innovation in the EU would also qualify for EU financial support under the ESI programme. Innovation will be crucial to the EU's global competitiveness and economic growth.

This category includes physical facilities and programmes supporting the EU's objective to be a global leader in innovation, such as research hubs and R&D projects in strategic sectors. This group could also include social infrastructure projects important for citizens' welfare, such as research hospitals and medical research facilities.

#### **4 EU programmes to finance long-term objectives**

This section focuses on the EU's approach to long-term investment. We develop a taxonomy of the EU's public investment instruments and initiatives and examine the outcomes in terms of private capital mobilisation.

#### 4.1 Taxonomy of EU public investment instruments and initiatives

We have identified 24 public investment initiatives implemented by the EU that are relevant to our study.

We discuss the six largest and most important initiatives in more detail: the Recovery and Resilience Facility (RRF), REPowerEU, the European Regional Development Fund (ERDF) and the Cohesion Fund (summarised in a single item because they share the same EU regulation), Horizon Europe, the European Fund for Strategic Investments (EFSI), and InvestEU.

We focus on these programmes because of their size and relevance to the concept of strategic investment in the EU.

We describe here briefly the purpose of each of these programmes and include a detailed taxonomy of all EU initiatives in Appendices 2 and 3<sup>9</sup>.

1. The RRF, created in 2020, provides €723.8 billion in grants and loans to support reforms and investments in EU countries. It is the centrepiece of NGEU, a temporary recovery instrument to support the economic recovery from the COVID-19 pandemic and to build a greener, more digital and more resilient future for the EU. NGEU is worth €806.9 billion as of 2023 and is scheduled to operate from 2020 to 2026<sup>10</sup>.
2. The related REPowerEU initiative was put together to help deal with the energy crisis following the Russian invasion of Ukraine in 2022. It aims to facilitate an affordable phase-out of Russian gas by 2027 and was funded by the €225 billion at the time still available in the loan component of the RRF that had not been claimed by member states.

To support REPowerEU, the financial envelope was increased with €20 billion in new grants. These grants will be financed through the frontloaded sale of emissions trading system (ETS) allowances and the resources of the Innovation Fund<sup>11</sup>, to be partly replenished through the Market Stability Reserve<sup>12</sup>.

Additionally, EU countries have the option to voluntarily transfer €5.4 billion of funds from the Brexit Adjustment Reserve<sup>13</sup> to the RRF to finance REPowerEU measures. This comes on top of the existing transfer possibilities of 5 percent from the cohesion policy funds<sup>14</sup> (up to €17.9 billion).

3. The ERDF and Cohesion Fund, with a total budget of €274 billion between 2021-2027, are dedicated to reinforcing economic, social and territorial cohesion within the EU.
4. Horizon Europe, with a total budget of €95.5 billion, is the EU's primary funding programme for research and innovation. It will be implemented in the period between 2021-2027.
5. The EFSI is the main vehicle of the investment plan for Europe (also known as the 'Juncker Plan'), created in 2015 to boost competitiveness and growth by helping unlock European Investment Bank financing for economically viable projects that would normally have been considered too risky for EIB participation. It pledged €33.5 billion and aimed to raise €500 billion by 2020 (a goal that was achieved; see section 4.2).
6. Finally, InvestEU the successor to the Juncker Plan, was created in 2021. Just like its predecessor it aims to enhance EU competitiveness, innovation, sustainability and social cohesion. It has pledged €26.2 billion and aims to raise €372 billion in investments.

The EU regulations underlying each of these instruments define the projects eligible for investment in terms of objectives rather than sectors. These objectives are typically very broad and therefore often overlap between programmes.

Projects enhancing the competitiveness, socio-economic convergence and cohesion of the Union, particularly in the realms of innovation and digitisation, are covered by all six instruments. The same is true for projects fostering sustainability, inclusiveness in the Union's economic growth and social resilience, including education, social infrastructure and training programmes.

All initiatives also aim at increasing access to finance for small and medium and mid-cap companies. Finally, meeting the sustainability and climate EU objectives figure prominently in each initiative.

Importantly, the regulations underlying all these recent initiatives, with a specific exemption concerning immediate energy security aims in REPowerEU and Horizon Europe, include a 'do no significant harm' clause, meaning that projects financed under these programmes cannot go against EU environmental objectives.

Programmes are managed and governed by different entities, but any given project can qualify for several of these programmes. Programmes are also targeted at different entities. For example, InvestEU funding is targeted at projects, while funding from the Cohesion Fund is disbursed to regions. Streamlining the number of initiatives could yield efficiency gains for strategic investment at the EU level.

Two main takeaways emerge from Table 1. The first is that there are two sources of funding for these programmes: the EU budget (MFF, either through direct funding or providing a guarantee) or funds raised through borrowing in the context of NGEU. Long-standing investment programmes that have been present in the EU budget for several

**Table 1. Shortened taxonomy of the main investment initiatives at EU level**

Name	Time	Budget	Source of funding	Instruments	Capital mobilisation targets (€ billions)
RRF	2021-2026	723.8 (which includes most of REPowerEU)	• Dedicated bonds (NGEU) • RRF	• Loans • Grants	-
REPowerEU	2022-2026	300 (mainly from RRF with only 20 billion being new grants)	• ETS allowances • Brexit Adjustment Reserve • Cohesion Funds	• Loans • Grants	-
ERDF/Cohesion Fund	2021-2027	274	• EU Budget	• Grants	-
Horizon Europe	2021-2027	95.5	• EU Budget • NGEU	• Mainly grants	-
EFSI	2015-2020	33.5	• EU Budget guarantee • EIB resources	• Credit enhancement (intermediate loans, subordinated loans, guarantees) • Loans • Equity • Venture debt	500
InvestEU Fund	2021-2027	26.2	• EU Budget guarantee	• Credit enhancement (intermediate loans, subordinated loans, guarantees) • Loans • Equity • Venture debt	372

Note: RepowerEU funds are for the most part from the unclaimed funds in the RRF and are therefore not new money.

Source: Bruegel.

EQ Europe Quarterly ■ Spring 2024

political cycles, such as Horizon or predecessors of the ERDF or Cohesion Fund, are mainly funded with resources from the EU budget.

The RRF (and REPowerEU) are funded through an issuance of EU debt in capital markets. NGEU, created during the pandemic, was remarkable for two reasons: first, it increased EU spending capacity by 75 percent; second, it was financed by the issuance of debt. The EU had issued small levels of debt in the past to finance loans.

It was the first time, however, that it issued such high levels of debt and that it issued debt to fund grants to member states. It is worth noting that a big part of the loan component of the RRF was not taken up by many countries at the start of the RRF, even if for some countries the interest rate charged under the RRF was lower than the market rate.

Subsequently, the existence of this underutilised pot allowed the money to be repurposed to deal with energy security under REPowerEU. EFSI and the InvestEU Fund are funded through a more recent financial structure — a guarantee from the EU budget.

The idea of a guarantee backed by the EU budget was born against the background of limited EU resources to spur investment when EFSI was designed (Claeys, 2015). Using the guarantee to absorb potential losses could attract private investors to projects that are considered too risky without the guarantee.

EFSI is one of the few programmes for which ex-post evaluation is possible since it started in 2015. Its target of mobilising over €500 billion based on €33.5 billion of resources would result in a target multiplier of over 15<sup>15</sup>. According to EIB analysis, this target was achieved (Wilkinson *et al* 2022). Therefore, the guarantee seems to have fulfilled its purpose.

However, as noted by Claeys (2015), the programme would only have been truly successful if it unlocked financing for projects that would not have been financed otherwise. Claeys and Leandro (2016) cast some doubt on this issue for the projects financed by EFSI in its first year. The EIB acknowledged that it cannot verify that all financed projects would not have been financed without its support (Wilkinson *et al* 2022).

Only EFSI and the InvestEU Fund set explicit targets for mobilising private investment. Additionally, the Horizon Europe regulation mentions maximising the mobilisation of private capital where possible. Finally, the RRF regulation mentions mobilisation of private capital, but rather as an additional benefit than an objective in itself.

When EFSI was announced, it was uncertain whether the EU budget guarantee would truly change the tendency of the EIB to invest in relatively low-risk assets (Claeys, 2015). According to the EIB, EFSI altered the riskiness of its portfolio with EFSI projects being on average riskier than other projects financed by the EIB.

However, as of 2022, the cumulative number of guarantee calls was modest, at approximately €184 million. This relatively low amount could suggest that a guarantee from the EU is enough to unlock financing for most projects executed under EFSI, without significantly increasing the burden on the EU budget.

On the other hand, the low default rate of projects could simply suggest that the projects were not very risky to begin with, and that the EU budget guarantee has not led the EIB to invest in significantly riskier projects.

In this regard, it should be noted that the EIB has a fiduciary duty towards the EU budget with regards to operations under the budget guarantee, and therefore a low default rate should be seen as positive.

The second takeaway from Table 1 is that programmes differ regarding the financial instruments used to finance projects of interest. The programmes funded by the EU budget or bond issuance (RRF, REPowerEU, Horizon Europe, ERDF and the Cohesion Fund) mainly use loans and grants.

The programmes funded by an EU guarantee and managed by the EIB use loans, equity, venture debt and credit-enhancement instruments. EFSI and InvestEU reflect a broader spectrum of capital market instruments. Credit-enhancement products in particular can be suitable for financing infrastructure projects (OECD, 2021).

These products transfer risk from investors to the EIB (backed by the EU budget) and can reduce the cost of financing while attracting additional investors<sup>16</sup>. Diversifying the range of financial instruments available to projects and companies is important for optimising resources and adapting the financing structure to project needs.

Some of the lessons learned from EFSI were embedded in the design of its successor, InvestEU. For example, under the EFSI regulation, the only implementing partner for financing projects was the EIB. A side-effect of this was that only relatively large projects were eligible for EFSI financing. Under InvestEU, the range of implementing partners was extended to local institutions.

The RRF required member states to prepare Recovery and Resilience Plans (RRPs) that detail national programmes of reforms and investments over the RRF period (up to 2026). Of the plan's total allocation, 37 percent and 20 percent should be allocated to the climate and digital objectives, respectively.

RRPs have been assessed by the European Commission and endorsed by the Council. The assessments comprise development of two documents, a Council Implementing Decision (CID), and a staff working document (SWD).

Milestones and targets are associated with each reform/investment (and detailed in the CID). The Commission disburses the funds after achievement of the pre-agreed milestones and targets at each payment request. Disbursement of funds is thus conditional on reaching milestones and targets.

The RRF experience will yield valuable lessons on the viability of making funding available to member states for strategic investments in combination with implementing structural reforms.

At the outset, however, while the grant component of the RRF was taken up by all countries, only a limited number of countries took up the loan component in the beginning<sup>17</sup> (Demertzis, 2022). This meant there were funds available that could be redirected to REPowerEU. Taking into account the latest requests at time of writing, take-up of the total loan component of the RRF (€385.8 billion) now amounts to €292.6 (or 76 percent). Some of the latest loan requests are still subject to formal approval<sup>18</sup>.

Member state performance in the context of the RRF remains to be evaluated. The RRF is a performance-based programme, in the sense that the disbursement of funds is conditional on countries achieving milestones and targets. But Darvas *et al* (2023a) argued that Article (2) of the regulation defines 'milestones and targets' as "*measures of progress towards the achievement of a reform or an investment.*" The expression "*measures of progress towards*" thus indicates a process, not necessarily the achievement of results. This has also been observed by the European Court of Auditors (2023).

Therefore, a clearer definition of 'performance-based' is needed and should be based on outputs and results. There is also discussion on whether the milestones and targets set are sufficiently ambitious. As mentioned by Corti *et al* (2023), Italy will successfully fulfil its milestones and targets but will likely not achieve some of the objectives of the measures included in its RRP, including reducing regional and local inequalities in the provision of employment and

childcare services. This could indicate that milestones and targets defined under RRF are too easy to achieve and not necessarily what the programme aims for.

Last, Claeys *et al* (2021) claimed that the temporary nature of NGEU borrowing, and its relatively small scale compared to borrowing by national governments, increased the cost of debt. Permanent EU borrowing would be more widely accepted by financial investors and could have the added benefit of creating a true European safe asset.

In addition to providing financing for projects, EU investment initiatives have also created auxiliary services to facilitate investments. For example, the European Investment Advisory Hub, established in 2015 alongside EFSI, aimed to enhance investment after the economic crisis. The Hub provides advisory services to project promoters to support investment in the real economy.

The Hub's objective is described (in Regulation 2015/2017) as building on existing EIB and Commission advisory services in order "*to provide advisory support for the identification, preparation and development of investment projects and act as a single technical advisory hub for project financing within the EU.*"

However, a report from the European Court of Auditors (2020) highlighted concerns. The Hub was deemed a 'demand-driven' tool without sufficient prior assessment of its advisory needs, potential demand or required resources. While it satisfactorily offered tailored advisory services, it lacked a clear strategy for targeting support where it could maximise value. Some beneficiaries questioned the uniqueness of Hub support compared to other advisory sources.

Moreover, only over 1 percent of EFSI-supported financial operations benefited from Hub assignments. Additionally, the Hub lacked proper procedures to follow up on investments resulting from its assignments, hindering performance evaluation.

By the end of 2018, the Hub had completed too few assignments to contribute significantly to boosting investment. These findings were considered in the design of its successor, the InvestEU Advisory Hub.

This Hub has replaced thirteen<sup>19</sup> centrally managed advisory programmes and is the central entry point for advisory and technical assistance requests. InvestEU Advisory Hub partners provide project advice, capacity building and market development support to promoters and intermediaries. The Advisory Hub is aligned with the objectives of the InvestEU programme.

#### 4.2 Leveraging private capital

One of the goals of past ESI initiatives was leveraging private capital. The two largest initiatives, the EFSI and InvestEU, have aimed explicitly at maximising the mobilisation of private capital. EU policymakers acknowledge that the investment volume needed to achieve long-term political objectives will need to be largely supplied by the private sector (European Commission, 2023a). Therefore, future efforts for ESI should also focus on maximising private-sector participation in investment projects where possible.

From a macroeconomic perspective, several studies document the positive effect of public investment on attracting private investment (Aschauer, 1989a; Abiad *et al* 2016; Pereira, 2001; Brasili *et al* 2023). Abiad *et al* (2016) showed that the effect is greater in times of economic slack and when public investment efficiency is high.

Brasili *et al* (2023) showed a positive effect of local government investment on private investment, while evidence from Brueckner *et al* (2022) suggested that local governments are more efficient in crowding-in private investment than national governments. Focusing on public R&D support programmes, Azoulay *et al* (2019) and Moretti *et al* (2019) showed that public R&D spending crowds-in private R&D investment.

Turning to the experience of past and present EU strategic investment initiatives, such public efforts can mobilise private investment in four ways. First, a public sector entity can finance or secure the riskiest tranche of capital of an investment project that private investors are unwilling to take on, leaving them the less risky part.

Second, public investment, notably in SMEs and mid-caps, can result in increased corporate investment. Third, having a large public institution with a good track record as part of the investor mix can enhance the credibility of a project.

Fourth, public investment in important enablers such as infrastructure or financial support for R&D activities can mobilise private capital and improve the use and allocation of resources (European Investment Bank, 2022c).

Recent EU programmes offer insights related to the first point. EFSI achieved its goal of mobilising over €500 billion of investment, according to EIB estimates, using only €26 billion in EU budget guarantees and €7.5 billion of EIB own resources, resulting in a multiplier of over 15 (Wilkinson *et al* 2022).

Overall, the strategic investment programmes managed by the EIB have been successful in mobilising private investment using guarantees, loans, equity and quasi-equity instruments. However, it should be noted that most of the assessment of EFSI is based on analyses by the EIB itself. The EIB's assessment of EFSI's activities yield some insight on how the multiplier of 15.75 was achieved.

Some, though not all, project promoters that benefitted from EFSI support under its Infrastructure and Innovation Window (IIW) highlighted in particular that the EIB's involvement in their project attracted other investors. However, promoters indicated that in some instances, EFSI financing might have crowded-out financing from other investors (Wilkinson *et al* 2022).

A survey of EFSI partners also indicated that EFSI operations led to improved availability and conditions of financing for SMEs and mid-caps, notably through increased lending activity to such firms at better conditions (lower collateral, fees, interest rates) by partnering lending institutions.

One in ten of respondents, however, reported that they could have obtained financing/guarantees at similar conditions from other sources without EFSI support. The EIB describes this level of redundancy as acceptable (Wilkinson *et al* 2022).

On the second point (increased corporate investment), given the relevance of SMEs in the European economy, the role of public investment in helping them increase their investments is particularly important. EIB analyses show that their loans translated to better financing conditions for SMEs and mid-caps, ultimately resulting in increased employment, investment and stronger growth of supported firms.

EIB (2022a) argued that their venture loans, which typically provide liquidity between rounds of raising equity in fast-growing firms, have helped lower financing costs and have crowded-in additional debt. The EIB estimates that alleviating financing constraints for EU firms could unlock €120 billion of corporate investment annually. Similarly, better infrastructure can lower the cost of doing business for firms and increase output.

On the third point, in addition to directly affecting the financing conditions for a project or company, EIB analyses indicate that EIB investment also has a reputational effect that can attract private investors.

Finally, public investment in infrastructure or research activities can generate additional private investment and improve productivity and the allocation of capital. European Investment Bank (2022c) projected that EFSI investment operations will have long-term positive effects on the EU economy, predominantly because of such structural effects.

The EIB makes use of financial instruments other than traditional equity and loans that can unlock private sector capital. Such instruments include intermediated loans, low-interest loans, credit enhancement, guarantees and venture debt. An important question is which financial instrument is most effective at crowding-in private investment.

Credit-enhancement products in particular have the clear potential to provide a high multiplier, ie. mobilising considerable investment by using a comparatively small amount of public resources. European capital markets are not as developed as in the United States.

Consequently, European companies have greater difficulty accessing risk capital than US counterparts. Furthermore, financing conditions for European firms might be deteriorating. The EIB Investment Survey (European Investment Bank, 2023b) indicated that the share of EU firms dissatisfied with the cost of finance in the EU increased from 5 percent in 2022 to more than 14 percent in 2023.

These factors increase the potential impact of public guarantees. In the future, research comparing different instruments in terms of cost and accessibility would be valuable in designing strategic investment programmes.

On the equity side, large infrastructure projects sometimes require an equity or quasi-equity buffer to make the project interesting for private investors. The public sector can play an important role in de-risking large-scale projects to attract private investors, including institutional investors such as pension funds and insurance companies.

The EFSI and InvestEU experiences show that equity and quasi-equity provided by the EIB has a positive effect for SMEs and mid-caps. Future ESI initiatives should explore the potential of such instruments to provide effective de-risking to projects.

## **5 Public investment management**

### **5.1 Framework and examples**

Improving the management of public investment is crucial in boosting the efficacy of public capital expenditure. Recent estimates indicate that roughly 30 percent of resources are lost in the process of managing public investment (Baum *et al* 2020).

Governments exhibit a relatively high level of inefficiency in deploying public investment, and Rajaram *et al* (2014) emphasised the range of reasons behind this phenomenon. The complexity of public investment projects, involving prolonged processes and presenting challenges in planning, coordination, financing, procurement and contract implementation, often results in cost overruns and delayed completion, surpassing even meticulously planned estimates. Baum *et al* (2020) estimated that inefficiencies could be halved through the enhancement of public investment practices.

Efficient public investment management across levels of government – regional, national and EU-level – is crucial for designing the future of ESIs. Insights from the public investment management can inform the ESI governance framework.

Based on this literature, we have identified four pillars for a well-functioning public investment system: i) planning, ii) budgeting, iii) implementation and monitoring, and iv) ex-post evaluation.

Underlying these four pillars are the '12 Principles for Action' for effective public investment management across levels of government, published by the OECD in 2014 (OECD, 2014; OECD, 2019).

In 2015, the International Monetary Fund proposed its own framework to assess the quality of public investment management practices – Public Investment Management Assessment (PIMA; IMF, 2015).

The PIMA Framework focus is on the concrete planning of investments (with attention paid to coordination between the different policy levels), on allocating investment to the right project (based on transparent criteria and a long-term vision) and on implementing the selected projects within the set timeframe and within the planned budget.

Finally, Manescu (2022) provided fresh insights into public investment practices within the EU. The key elements highlighted for an ideal public investment system across various stages, as highlighted by Manescu (2022) include: planning, appraisal and selection, budgeting, monitoring and implementation, ex-post reviews and assets registers.

We highlight four pillars to enhance a public investment system, within which we classified the 12 Principles of the OECD:

### *5.1.1 Planning*

Governments should formulate robust investment plans based on a comprehensive, long-term strategy. These plans should include deliverables, accurate cost estimates, an assessment of existing capital assets and identified needs.

**Table 2. Four pillars of public investment management**

Pillar 1: Planning	Pillar 2: Budgeting	Pillar 3: Implementation and monitoring	Pillar 4: Ex-post review
Principle 1: Develop an integrated investment strategy tailored to local factors	Principle 6: Mobilise private investors and financing institutions to diversify sources of funding and strengthen sub-national capacities	Principle 5: Engage with stakeholders throughout the investment cycle	Principle 7: Strengthen the proficiency of public officials and institutions engaged in public investment, particularly at the sub-national level
Principle 2: Adopt effective instruments for coordination across national and sub-national levels of government	Principle 7: Develop a fiscal framework aligned with investment objectives pursued	Principle 11: Promote transparency and strategic use of public procurement	Principle 8: Focus on results and promote learning from experience across levels of government
Principle 3: Coordinate horizontally among sub-national governments to invest at the relevant scale	Principle 10: Enforce sound and transparent financial management at all levels of government	Principle 12: Ensure quality and consistency in regulatory systems across levels of government	
Principle 4: Assess the long-term impacts and risks of potential projects upfront			

Note: Principles from OECD.

Source: Bruegel.

The objectives are to: i) design and implement investment strategies tailored to the specific locations they intend to benefit; ii) foster synergy and minimise conflicts between different sectoral strategies; and iii) encourage the production of data at the appropriate sub-national level to guide investment strategies and provide evidence for decision-making.

While most EU countries have some form of strategic investment planning, the extent can vary. Some examples of clear, multi-year investment plans can be found in the Netherlands (MIRT), Ireland (Project Ireland 2040) and Latvia (NDP27)<sup>20</sup>.

Coordination between different entities involved in a public investment effort is an essential aspect of success. Neglecting this can lead to misallocation of resources. In the Netherlands, a good example is the Association of Dutch Municipalities (*Vereniging van Nederlandse Gemeenten*, VNG), which unites all municipalities, and the Association of Provinces (*Interprovinciaal Overleg*, IPO) which coordinates between sub-national administrative layers.

In the UK, a Cities Policy Unit was created in 2011 with public, private, central and local stakeholders to help coordinate urban policy. The goal of the Cities Policy Unit is to work with cities and government to help cities create new ideas and turn the ideas into successful plans.

In Italy, the Interministerial committee for economic planning and sustainable development (CIPESS) is an example of efforts to minimise conflicts between different sub-national governments. CIPESS is responsible for the coordination and horizontal integration of national policies, and for aligning Italy's economic policy with EU policies.

Finally, France has the *Contrats de plan État-région* (CPER), operational since 1982, which are important tools in regional policy in terms of planning, governance and coordination.

### **5.1.2 Budgeting**

The second pillar refers to the importance of establishing a well-designed, stable and transparent medium-term budgetary framework that will ensure reliable budgeting for public investment. The goal is to promote consistency between annual budget decisions and the multi-annual lifespan of investment projects.

Additionally, involving private parties and financing institutions in investments can strengthen government capacity and bring expertise to projects, improving ex-ante assessment and achieving economies of scale and cost-effectiveness. Public-private partnerships (PPPs), enabled through innovative financing instruments, are ways of leveraging private capital that provides necessary scale and scope for investments.

The UK also utilises the Medium-Term Fiscal Framework (MTFF) to align budget preparation and public investment plans with fiscal policy. In France, key entities involved in public investment management include Bpifrance and *Caisse des Dépôts et Consignations* (CDC). Both institutions are tasked with investing in projects with policy goals and collaborating with the private sector.

### **5.1.3 Implementation and monitoring**

Monitoring serves at least two related purposes: i) it can facilitate efficient capital allocation and, ii) it can identify potential problems early on and solicit remedial action. Good practices include the publication of monitoring reports, including reappraisal and termination options in project agreements, and defining and enforcing milestones.

Implementation is facilitated by ensuring consistent regulatory frameworks across the different levels of government involved. Furthermore, public entities should engage with a project's stakeholders regularly throughout the investment cycle.

In France, the *Secrétariat général pour l'investissement* (SGPI) is responsible for ensuring the coherence and monitoring of the state's investment policy through the implementation of the France 2030 plan. It is involved in the decision-making processes related to contracts between the state and investment management entities, and coordinates the preparation of project specifications and monitors their alignment with government objectives.

Moreover, it is responsible for the overall evaluation of investments, both before and after implementation. In the Netherlands, the Delta Programme represents a collaborative initiative involving the Ministry of Infrastructure and Environment, provinces, municipal councils and regional water authorities, working closely with social organisations and businesses.

Established in 2010, its primary objectives are to safeguard the Netherlands from flooding and secure a sustainable freshwater supply for the next century. Active stakeholder engagement in the programme has resulted in tailored strategies and the commitment of various entities at both regional and national levels.

Furthermore, the Rijkswaterstaat has a major role in managing the three major infrastructure networks: the road network, the waterway network and the water system.

In the UK, to engage public, private and civil society stakeholders throughout the investment cycle, the government uses Local Strategic Partnerships (LSPs), which are non-statutory bodies that bring together different parts of the public, private, voluntary and community sectors working at local level. LSPs have no legal powers or resources of their own.

### **5.1.4 Ex-post reviews**

Clearly defining the desired outcomes of public investments is of utmost importance. To achieve this, evaluation and monitoring criteria should be established during the initial phases of policy design. This is essential for allocating necessary resources and generating relevant data.

Consequently, regular status and completion reports, and thorough ex-post reviews, become imperative to learn from past experiences. Additionally, fostering active information exchange and ongoing mutual learning among stakeholders engaged in public investment further enhances the effectiveness of the process.

In the EU, ex-post reviews are common but sometimes restricted to a subset of projects. For example, in Ireland, the Public Spending Code requires all large capital projects and a proportion of other capital projects to undergo ex-post review, while in France a similar requirement is in place for the investments in the France 2030 plan.

Furthermore, in many EU countries public administrations often lack the required knowledge and skills needed for effective public investment management, resulting in significant barriers to investment. The European Investment Bank (2023a) identified, for example, the lack of available skills such as environmental planning and engineering expertise as significant factors hampering investment projects.

Enhancing the capacity for public investment in public institutions across all levels of government is important to create an enabling environment.

In Italy, the Basilicata region invested heavily in monitoring and evaluation to support decision-makers. The region has created a Public Investment Evaluation Unit (NVVIP), which is responsible for monitoring and evaluation, including through impact assessments, all public investments in the region, and for checking the consistency of strategic projects with respect to the regional development plan and the annual financial plan.

In Ireland, the Irish Commercial Skills Academy (CSA) was setup in 2019 to offer training on best-practice approaches for effective delivery throughout the lifecycle of a project. Its aim is to enhance the skillsets of key spending departments and public sector bodies.

## 5.2 Public investment management and European strategic investment

The OECD principles serve as the fundamental basis for any public investment management system. However, when applied to ESIs, certain nuances emerge.

For instance, Principle 2 necessitates effective coordination not only between levels of government within EU countries, but also between the EU and its member states. One plausible solution could be the establishment of dedicated agencies within each country that would be responsible for screening projects from that country and liaising with the EU institution responsible for project selection.

Infrastructure financing is highly complex and requires a specific set of skills and experience, not only to assess the viability and financing of a project, but also its long-term impact. In line with OECD Principle 4 (on assessment), it is important to include experts in the teams responsible for project appraisal and selection in member states and at EU level.

A guiding principle should be value for money to maximise efficiency and the impact of EU funds, as well as to avoid duplication. Similarly, specific teams should be set up for project monitoring, and for maximising the use of technology for efficient monitoring.

The EU has a mixed track record in infrastructure planning. Effective planning is crucial to mitigate the risk of misallocating EU funds to poorly planned or poorly executed infrastructure projects – so called ‘white elephants’. Misallocating societal resources is a financial burden for public institutions, and undermines public welfare.

Large infrastructure projects often experience cost overruns coupled with shortcomings in expected benefits<sup>21</sup>, highlighting the importance of sound planning practices. The EU can play an important role in ensuring efficient allocation of funds for investment by planning and designing projects well.

While many infrastructure projects that benefit from EU funds, for example under EFSI and InvestEU, have been successful, EU resources have also been allocated to projects that were not well planned or executed.

For example, the European Court of Auditors (ECA, 2014) detailed flaws in EU infrastructure planning<sup>22</sup>, notably in relation to airports. EU financing was used to build airports that were too big or too close to each other. The Court noted that EU financing operations were insufficiently supervised by the European Commission, leading to over-capacity and poor value for money.

The UK experience can also be instructive. The DfT (2015) value for money framework indicates the department's approach to assessing value for money and requires a clear value-for-money case for any proposal involving public resources.

Such a principle should also be applied to ESIs. It is important to not repeat the same mistakes in the future, and rather work towards replicating successful practices.

The EU should carry out a systematic review to establish a set of best practices based on successful projects. It should also recognise and assess the projects that have failed to deliver on their promises and aim to learn from those mistakes. Better control over the process can be aided by reducing the number of institutions responsible for disbursing funds for ESIs and by investing in capacity building.

A challenge particular to the EU is the extensive fragmentation of planning and of existing network infrastructure. Infrastructure is mostly planned at member state level. Connecting network infrastructures originally built by different entities can be challenging within a single country (Helm, 2023), and this challenge is only amplified when striving to connect networks across national borders within the EU.

The EU's ability to support such projects is not limited to financing either. A more coordinated approach to infrastructure planning and harmonisation of regulatory frameworks between EU countries could yield significant benefits (Dermine *et al* 2023). The EU is uniquely positioned to take on this responsibility.

### **6 Takeaways from the EU's experience**

We summarise a few takeaways from the EU's experience in pursuing long-term objectives.

**Europe faces large investment gaps.** We have identified significant investment gaps to meet the two major transitions that will ensure that the EU remains competitive globally. Several studies have argued that the public sector will have a major role to play in financing these gaps, alongside the private sector.

We also argue that those objectives that are of strategic relevance and refer to European public goods should be financed at EU level.

**Lack of continuity.** The EU has created several investment programmes (section 4). Some important current instruments – InvestEU and the RRF – have limited lifespans (expiring in 2027 and 2026 respectively) and are not expected to be repeated when they expire.

The finite nature of these programmes is not conducive to an investment framework that pursues long-term objectives. This ‘stop-and-go’ culture is not in line with the long-term nature of strategic investments and is detrimental to planning for the public and private sectors alike.

Rather than a sequence of programmes, therefore, the EU needs a long-term financing framework for strategic investments beyond the current planning horizon of approximately five years.

**Need for simplification and capacity building.** Current and past programmes have overlapping objectives that create information frictions. There is therefore a need to streamline the objectives of each programme to avoid complexity and help match programmes to investors. Experience with the RRF and at member state level has shown the importance of coordination across levels of government regarding planning of strategic investment.

Capacity building at all levels of government is also crucial to ensure a steady flow of high-quality projects and efficient implementation. EIB analyses show that local authorities often lack the capacity for implementation of investment programmes.

**Coordination.** Some of the country-level examples show that there is value in coordinating public investment management between different levels of government, both in terms of identifying good projects and monitoring progress. Carrying this over to the EU level is crucial, as the EU adds an extra layer of governance and therefore increases the level of complexity.

**Do no significant harm.** The ‘do no significant harm’ principle, as set out in EU regulations, refers only to environmental objectives. No project pursued should contradict environmental targets. We go a step further and

suggest that strategic investment co-financed by the EU's ESI programmes should not be inconsistent with any long-term objectives, including environmental goals.

While events may require objectives to be reprioritised, investments should not contradict single or multiple long-term objectives. There is a great need therefore to balance carefully the multiple objectives over time.

**Evaluation based on outcomes.** The RRF has shown the importance of robust and well-defined performance indicators. However, evaluation should be based on outputs and results. Milestones and targets should be observable metrics of results and not only of progress made. For instance, in the case of a power plant, a result indicator could be a predetermined level of energy production to be achieved by a specified year.

**Lack of standardisation.** There is a lack of standardisation in reporting and planning public investment projects in the EU. The EU should create and promote the use of templates for similar investment projects. A single reporting procedure would reduce the administrative burden and enable investment by reducing red tape.

Financing instruments to tackle big risks and incentivise reform. We believe two issues are important when setting up investment-finance programmes:

1. Absorbing risk. As a result of the EU not having deep capital markets, sufficient 'risky' capital is not available. Both the climate and digital transitions require accepting high levels of risk, which banks, the traditional funders of investment in Europe, cannot take. Public authorities have a major role to play to fill in this gap.

By providing carefully designed public credit-enhancement instruments backed by, for example, public budget guarantees, the public sector will be insuring against the riskiest part of any given investment,

thereby releasing private funds to cover the rest. Equity and quasi-equity instruments should also be used for efficient de-risking to attract private investors.

2. Incentivise reforms. The combination of a grant and loan programme, as implemented under the RRF, has interesting features worth replicating. The loan component increased the total envelope of funds available. This would allow a few countries to borrow below market prices. The link to reforms provided the right incentives to accelerate a number of structural measures.

**Sources of EU funding.** European funding so far has come from two sources: 1) the Multiannual Financial Framework (MFF), or long-EU term budget that covers a seven-year period (€1074 billion at 2018 prices for 2021-2028); 2) through debt issuance at EU level (€750 billion at 2018 prices for 2021-2026). When it comes to funding, there are three issues to resolve.

i. Lack of sufficient own resources. As part of repaying the borrowing for common debt issued under the NGEU programme, the EU is at time of writing discussing how it can increase its 'own resources'. Making progress on this issue can also be important for ensuring dedicated resources for strategic investment at EU level.

ii. The question of fiscal capacity. The issue of fiscal resources is crucial. Many EU countries have high debt levels and, with the return to the EU fiscal rules expected at the start of 2024, we expect that not all countries will be able to undertake investments at the same speed and level.

The fiscal space is very different in different countries and countries will also be impacted differently by EU fiscal rule constraints from January 2024. The EU has an important role to play in supporting countries in strategic investment.

The RRF is a prime example that allowed countries to continue to invest in the green and digital transition while releasing funds to deal with the pandemic crisis.

The urgency of advancing with some of the long-term goals dictates that there should be coordination between countries on how to make progress in ways that do not jeopardise achievement of the goals. This coordination need is at the heart of the rationale of pursuing certain ESIs at the EU level.

iii. EU debt issuance has not benefitted from scale or quality. The experience of RRF debt issuance has shown that the EU has not benefitted as much as it could have done (Claeys *et al* 2021). If the EU establishes a stream of 'new' own resources, then it can credibly issue long-term debt and therefore benefit from its scale and the market demand for high-quality debt. ESIs are the prime candidate to be financed by common and intertemporal means, such as EU-issued debt.

## **7 Conclusions and policy recommendations for ESIs beyond 2026**

In this paper, we have defined European strategic investments and discussed how such investments can be supported with EU resources. Investments that are of strategic relevance to the EU are those that are in line with the priorities set and are consistent with the EU's long-term objectives.

Countries, private firms and the EU itself must finance the twin transitions, among other things, that EU societies will undergo over the next decades. The EU's involvement in directly financing some of these strategic investments is desirable when there is European value added, such as efficiency gains and crossborder coordination, and when the additionality criterion is satisfied.

The green transition is among the most important strategic objectives that the EU must pursue. Pisani-Ferry *et al* (2023) pointed to the huge annual investment needs to achieve a 55 percent emissions reduction by 2030 compared to 1990. The EU's role in helping countries achieve that is crucial.

Pisani-Ferry *et al* (2023) advocated for an EU green investment plan to match the NextGenerationEU resources after NGEU ends in 2026. As a prime example of a European (and indeed global) public good, unless all countries advance at a minimum common speed, the EU will not meet its climate objectives.

The EU can play an important role in making sure that the necessary investments in energy and transport systems suggested by Pisani-Ferry *et al* (2023) are done by all countries, while also safeguarding a fair transition.

Based also on the EU's experience with strategic investments so far, we make a number of recommendations, grouped into three categories: 1) how to repurpose existing funds and tools to tackle ESIs, 2) the role of the EIB in this process, and 3) issues beyond the EU funds currently available.

First, we discuss how to redirect or reform current tools to finance European strategic investments.

1. Create a dedicated long-term financing programme for ESIs. The pursuit of long-term objectives requires stable and predictable financing resources. A possible source of funding could be the EU budget or guarantees backed by the EU budget, building on the experiences with EFSI and InvestEU.

The programme should at the very least be a stable component of the MFF, to facilitate planning for implementing partners, public or private. This fund should be accompanied by a permanent advisory facility following the lessons learned from the InvestEU Hub and its predecessors.

A clear definition of European strategic investments should be established that defines a set of projects potentially eligible for financing from ESI resources.

2. Streamline and centralise. Based on prior experience, there are gains to be had by streamlining existing programmes for financing infrastructure, R&D and SMEs in the EU. We recommend centralising the management and funding of these programmes, where possible.

This will give a better overview of financing opportunities for implementing partners, reduce redundancies (such as project evaluation by several different EU institutions) and simplify the financing process. One central institution in each member state should liaise with the EU on ESI projects.

Such a structure would have the added benefit of a single contact point for private-sector entities (particularly infrastructure promoters and SMEs) interested in applying for ESI financing. ESI initiatives should also collaborate with local implementing partners, where possible and useful.

3. Link financing to reform. ESI programmes should encourage reform by providing the right incentives. The RRF experience has shown the potential for enabling change if a grant provided is made conditional on reform. ESI financing from the EU to its member states should be made conditional on implementing policies enabling strategic investment and, more generally, addressing obstacles to investment.

Examples include the reduction of red tape in permitting procedures related to large infrastructure projects, or increasing the capacity of public authorities to assess strategic projects. Capital for strategic investments can be a strong incentive for EU countries to undertake such reforms. Importantly, any such reforms should be democratically legitimate in the member state concerned.

4. Second, we believe that the EIB can play a crucial role in identifying, selecting, financing and monitoring strategic investments in the EU.

5. A central role for the EIB. The EIB could take on an important role in the ESI financing programme by evaluating and selecting projects applying for ESI financing, building on its expertise as the central implementing institutions of the EFSI and InvestEU.

The EIB would be well placed to assess from a technical and economic point of view the projects brought to it by national coordinating institutions and other implementing partners.

6. Use the entire range of financial instruments to finance risks. ESI programmes should aim to maximise private sector investment by committing to finance the riskiest components of any investment project. To achieve this goal, the ESI Fund should make use of the full range of financial instruments, including equity, quasi-equity, credit guarantees, debt and subordinated debt. ESIs can require complex and diverse financing structures.

Therefore, it should be possible to adapt the financing structure on a case-by-case basis, choosing from a wide range of financial instruments. The mandate of the EIB and the ESI Fund should also allow development and use of new financial instruments in response to evolving market gaps.

7. Create a toolkit for identifying EU added value and additionality. As part of increasing the transparency and efficiency of EU investments, we recommend the creation of an explicit toolkit for the identification of EU value added.

This will be used in the selection of projects and will have the purpose of demonstrating why a project is better financed at the EU level and to what end. Equally, clear tools and procedures should be developed to assess additionality in order to maximise the impact of EU resources. Member states should be encouraged to use the toolkit in their assessments of strategic investments.

8. Set milestones and evaluate outcomes with transparent metrics and focus on results. To be able to evaluate outcomes and results, well-defined milestones, outcomes and result indicators should be put in place for each project. These milestones should be based on outputs and results and not processes.

Availability of the necessary tools and capacity to monitor projects continuously should be ensured. Third, in line with the aim of achieving long-term goals we offer a few recommendations that go beyond the EU's current budgetary structure and touch on necessary enablers for strategic investments.

9. Make progress with new own resources. The EU needs to make progress on increasing its own financial resources. If the EU has sufficient own sources of revenue, it can provide stable finance for ESIs, which can help avoid the stop-and-go tendency that has dogged investment programmes in the past.

A clearly agreed framework for increased own resources would also enhance the EU's ability to issue debt to fund strategic investments. The intergenerational aspect of many strategic investments, in particular investments to achieve climate objectives, would justify the funding via long-term debt.

10. Standardise procedures for project planning and financing applications. The EU is uniquely positioned to promote standardisation and coordination of procedures for large-scale strategic investment projects.

It should advocate the adoption of templates for similar projects across countries, and for uniformity in related procedures. Harmonised reporting would also facilitate ex-post assessments and the exchange of information.

11. Encourage other policies that enable ESIs. Several issues pertaining to regulation or policies will enable the promotion of ESIs. Investments in certain types of infrastructure and their operation require new sets of skills. Acquiring them via upskilling or reskilling needs to be an integrated part of the process to achieve optimal outcomes.

Similarly, the EU can also pursue certain activities as one, for example, procurement or coordinated regulation to facilitate the uptake of investments.

The EU can also assist member states in improving national governance frameworks for strategic investment, building on best practices in the region, and maximise synergies between national strategic-investment programmes and ESI financing programmes. The reforms connected to ESI funding should promote this.

12. Promote the creation of a capital markets union. The scale of investment needed implies the private sector will need to play a very significant role. While we recommend that the EU picks up the riskiest parts of investments to encourage private-sector participation, EU funds can only go so far.

The European economy lacks sources of capital more prepared to take on the risks of financing a future that is increasingly uncertain. The EU must make visible progress in encouraging the further development of capital markets and coordinate them at the EU level to exploit economies of scale.

One possible way ahead would be to revive the market for securitisation and to continue the progress made in 2022 in terms of significant risk transfer by euro area banks<sup>23</sup>. Establishing the capital markets union would also simplify the framework for crossborder capital investment and could prove to be a powerful enabler. ■

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## Endnotes

1. See the European Commission's [2019-2024 priorities website](#).
2. See: [https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/stronger-europe-world/global-gateway\\_en](https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/stronger-europe-world/global-gateway_en).
3. Targets include, for example, having all public services accessible online and having 75 percent of EU companies using cloud services, artificial intelligence and/or big data; see [https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age/europes-digital-decade-digital-targets-2030\\_en](https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age/europes-digital-decade-digital-targets-2030_en).
4. See: [https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/promoting-our-european-way-life/european-health-union\\_en](https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/promoting-our-european-way-life/european-health-union_en).
5. A reform of the framework was agreed in principle in late December 2023; see Jeromin Zettelmeyer, '[Assessing the Ecofin compromise on fiscal rules reform](#)', First Glance, 21 December 2023, Bruegel..
6. In other words, stronger institutions to manage public investments.
7. We follow the definition of gross fixed capital formation as provided in the European system of accounts (ESA 2010, paras 3.124-3.138). The performance of R&D that gives rise to new intellectual property products is classified as capital under ESA 2010. For more detailed information on R&D measure in ESA 2010 see Eurostat (2014).
8. Our examples are partially based on Buti et al (2023) and Pisani-Ferry et al (2023).
9. The reported figures in some cases include investment spending and funding for non-investment activities, when no breakdown was available.
10. In addition to the €723.8 billion under the RRF, NGEU contributes to other programmes including REACT-EU, InvestEU, the Just Transition Fund, RescEU and the European Agricultural Fund for Rural Development (EAFRD).
11. The Innovation Fund, funded by emissions trading system (ETS) revenues, supports low-carbon technologies and impactful projects in Europe for significant emission and greenhouse-gas reductions.
12. The Market Stability Reserve is a mechanism intended to tackle excessive surpluses of EU ETS allowances and to improve the system's resilience to major shocks by adjusting the supply of allowances to be auctioned.
13. The Brexit Adjustment Reserve supports EU countries negatively affected by Brexit, with a strong focus on those most

affected.

14. The cohesion policy funds encompass the European Regional Development Fund (ERDF), Cohesion Fund, European Social Fund Plus (ESF+), and Just Transition Fund (JTF).
15. See section 4.2 for a more detailed discussion on leveraging private investment under EFSI and InvestEU.
16. See section 4.2 for additional information on the impact of EFSI financing operations.
17. Maria Demertzis, '[Next Generation EU: an underused facility?](#)' Cyprus Mail, 19 November 2022.
18. See Council of the EU press release of 8 December 2023, '[Recovery fund: Council greenlights amended national plans for 13 member states](#)'.
19. Horizon 2020 (EE11 PDA), InnovFin Advisory, Connecting Europe Facility (CEF, through JASPERS), ELENA (European Local ENergy Assistance), European Investment Advisory Hub (EIAH), Employment and Social Innovation (EaSI) Technical Assistance, Natural Capital Finance Facility (NCFF) support facility, Smart Specialisation Platform for Industrial modern, CEF Programme Support Actions, European Energy Efficiency Fund (EEEF) technical assistance, City Facility, Private Finance for Energy Efficiency (PF4EE) Expert Support Facility, Islands Facility.
20. Detailed country case studies on the public investment management initiatives mentioned in this section and projects pursued can be found in Appendix 3.
21. For an extensive discussion of large project management see Flyvbjerg and Gardner (2023).
22. There are also country examples capturing the contradiction between the original purpose of EU funding and actual social benefits. See Toth et al (2023) for details on Hungary.
23. For a recommendation on the issue of securitisation, see European Central Bank, '[A new high for significant risk transfer securitisations](#)', Supervision Newsletter, 23 August 2023.
24. See European Commission press release of 18 May 2022, '[Factsheet on Financing REPowerEU](#)'.
25. The market maturity was a limitation on certain types of lending and equity financing. Countries with more developed markets ended up putting forward more proposals.
26. 75 percent of the guarantee is implemented by EIB Group.

27. See European Commission: [https://finance.ec.europa.eu/sustainable-finance/tools-and-standards/eu-taxonomy-sustainable-activities\\_en](https://finance.ec.europa.eu/sustainable-finance/tools-and-standards/eu-taxonomy-sustainable-activities_en).
28. See Sandbag's website.
29. Lorna Booth, '[Goodbye PFI](#)', House of Commons Library, UK Parliament, 30 October 2018.
30. Act of 31 December 2012 about Public Finance Planning.

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## Appendix 1. Taxonomy of EU Investment Initiatives

**Table A1. Financial information on 24 EU investment initiatives**

REACT-EU	2021-2023	50.6	<ul style="list-style-type: none"> <li>• NGEU</li> </ul>	the forms laid down in the Financial Regulation	-
European Fund for Sustainable Development Plus	2021-2027	40	<ul style="list-style-type: none"> <li>• EU budget guarantee</li> </ul>	<ul style="list-style-type: none"> <li>• Grants</li> <li>• Technical assistance</li> <li>• Guarantees</li> <li>• Equity</li> </ul>	-
Connecting Europe Facility	2021-2027	33.71	<ul style="list-style-type: none"> <li>• EU budget</li> </ul>	<ul style="list-style-type: none"> <li>• Grants</li> <li>• Procurement</li> <li>• Blending operation</li> </ul>	-
EFSI	2015-2020	33.5	<ul style="list-style-type: none"> <li>• EU budget guarantee</li> <li>• EIB resources</li> </ul>	<ul style="list-style-type: none"> <li>• Credit enhancement (intermediate loans, subordinated loans, guarantees) <ul style="list-style-type: none"> <li>• Loans</li> <li>• Equity</li> <li>• Venture debt</li> </ul> </li> </ul>	500
InvestEU Fund	2021-2027	26.2	<ul style="list-style-type: none"> <li>• EU budget guarantee</li> </ul>	<ul style="list-style-type: none"> <li>• Credit enhancement (intermediate loans, subordinated loans, guarantees) <ul style="list-style-type: none"> <li>• Loans</li> <li>• Equity</li> <li>• Venture debt</li> </ul> </li> </ul>	372
Just Transition Fund	2021-2027	17.5	<ul style="list-style-type: none"> <li>• EU budget</li> <li>• External assigned revenues</li> </ul>	<ul style="list-style-type: none"> <li>• Funding may be provided in any of the forms laid down in the Financial Regulation</li> </ul>	30

STEP	2021-	14.5	<ul style="list-style-type: none"> <li>EU budget</li> </ul>	<ul style="list-style-type: none"> <li>Dispersed through different funds so will depend on the relevant fund</li> </ul>	160
EIC Fund	2021-2027	10	<ul style="list-style-type: none"> <li>EU budget guarantee</li> <li>EIB</li> </ul>	<ul style="list-style-type: none"> <li>EU budget guarantee</li> </ul>	-
Digital Europe Programme	2021-2027	7.5	<ul style="list-style-type: none"> <li>EU budget</li> </ul>	<ul style="list-style-type: none"> <li>Mainly grants, prizes, procurement</li> <li>But funding may be provided in any of the forms laid down in the Financial Regulation</li> </ul>	-
EU4Health	2021-2027	5.8	<ul style="list-style-type: none"> <li>EU budget</li> <li>NGEU</li> </ul>	<ul style="list-style-type: none"> <li>Funding may be provided in any of the forms laid down in the Financial Regulation</li> </ul>	-
LIFE	2021-2027	5.4	<ul style="list-style-type: none"> <li>EU budget</li> </ul>	<ul style="list-style-type: none"> <li>Mainly grants, prizes, procurement</li> <li>Mainly grants, prizes, procurement</li> </ul>	-
Single Market Programme	2021-2027	4.2	<ul style="list-style-type: none"> <li>EU budget</li> </ul>	<ul style="list-style-type: none"> <li>But funding may be provided in any of the forms laid down in the Financial Regulation</li> </ul>	-
EU Civil Protection Mechanism (rescEU)		3.3	<ul style="list-style-type: none"> <li>EU budget</li> </ul>	<ul style="list-style-type: none"> <li>Mainly grants, prizes, procurement</li> <li>But funding may be provided in any of the forms laid down in the Financial Regulation</li> </ul>	-
Euratom Research and Training Programme	2021-2027	1.38	<ul style="list-style-type: none"> <li>EU budget</li> <li>NGEU</li> </ul>	<ul style="list-style-type: none"> <li>Funding may be provided in any of the forms laid down in the Financial Regulation</li> </ul>	-
Social Climate Fund		-	<ul style="list-style-type: none"> <li>ETS 2</li> </ul>	<ul style="list-style-type: none"> <li>Funding may be provided in any of the forms laid down in the Financial Regulation</li> </ul>	72.2
Innovation Fund	2021-2027	-	<ul style="list-style-type: none"> <li>Monetisation of 530 million ETS allowances</li> </ul>	<ul style="list-style-type: none"> <li>Grants</li> <li>Blending operations</li> </ul>	40

## **Appendix 2. Detailed descriptions of EU investment programmes**

### **Investment Plan for Europe (2015-2020)**

#### *Description*

EFSI is one of the three pillars of the Investment Plan for Europe (also known as the Juncker Plan) that aimed to revive investment in strategic projects around the continent to ensure that money reaches the real economy.

EFSI's purpose was to unlock EIB financing for economically viable projects that would have been considered too risky for EIB participation without the EFSI. EFSI itself was/is backed by a guarantee from the EU budget. It aimed at boosting long-term economic growth and competitiveness in the European Union.

The projects covered areas such as infrastructure, research and innovation, education, health, information and communications technology and other areas. EFSI had two windows: the Infrastructure and Innovation Window (IIW), managed by the EIB, and the SME Window (SMEW), managed by the EIF.

EFSI provided a €26 billion budgetary guarantee from the EU budget, complemented by €7.5 billion allocation from the own resources of the EIB. The EFSI managed to over-deliver, while mitigating the impact of COVID-19 on Europe's economy.

#### *Implementation*

As of 31 December 2022, EFSI financing approved by the EIB Group led to a total investment value of €524.9 billion, therefore surpassing the target set by policy makers. In terms of financing signed, the total mobilised investment is €503.0 billion (European Commission, 2023b).

European Commission (2022b) and EIB (2022b) found that the EU guarantee proved significant as it enabled the EIB Group to undertake riskier activities, in line with expectations when the EFSI was designed. EFSI also proved a relevant tool to mobilise private capital.

However, the different EIB evaluation reports have underlined some concentration in those member states with well-developed institutional capacities<sup>25</sup>, possibly resulting in an unequal distribution of funds.

The availability of the EU Guarantee proved to be an efficient tool to considerably increase the volume of riskier operations by the EIB Group. In particular, the EFSI budgetary guarantee freezes less budgetary resources compared to financial instruments, as it requires limited provisioning needs compared to the level of financial engagement.

As of 2022, the cumulative amount of guarantee calls is modest at about €184 million. Given that this represents a relatively modest sum, it suggests that the EIB is capable of assuming greater risks. This relatively low amount could suggest that a guarantee from the EU is enough to unlock financing for the vast majority of projects executed under EFSI, without significantly increasing the burden on the EU budget.

On the other hand, the low default rate of projects could simply suggest that the projects were not very risky to begin with, and that the guarantee has not led the EIB to invest in significantly riskier projects. Therefore, the EU guarantee could be directed towards projects with even higher levels of risk.

### *Lessons to be learned*

EFSI was the start of a paradigm shift towards a different way of using EU financial resources – away from grants and towards financial guarantees backed by the EU budget. This enabled the use of fewer resources for the same objectives and implemented the idea of attracting private sector financing for projects fitting public policy goals.

However, there is a trade-off between volume and impact, because to make a greater impact, a high provisioning rate is needed. One critique that comes out of the different evaluations is that some type of projects (eg. public sector projects of the municipalities, sustainable infrastructure, social infrastructure, and social economy) remained too small for the EIB intervention under the EFSI.

Therefore, opening the EU guarantee to new implementing partners would be favourable as this will also enable a better outreach of the EU guarantee and provide a local presence.

## InvestEU (2021-2027)

### *Description*

The InvestEU programme aims to enhance EU competitiveness, innovation, sustainability, and social cohesion. It is demand-driven and focuses on strategic, long-term goals in key policy areas that may lack funding, aligning with EU policy objectives.

The InvestEU programme consists of three components: the InvestEU Fund, the InvestEU Advisory Hub and the InvestEU Portal. The InvestEU Fund should support projects that are economically viable by providing a framework for the use of debt, risk sharing, and equity and quasi-equity instruments backed by a €26.2 billion guarantee from the Union budget and by financial contributions from implementing partners. It aims to trigger more than €372 billion in investments.

The InvestEU programme supports four main policy areas: i) sustainable infrastructure with €9.9 billion ii) research, innovation and digitisation with €6.6 billion, iii) SMEs with €6.9 billion, and iv) social investment and skills with €2.8 billion.

### *Implementation*

InvestEU is a multifaceted financing initiative that goes beyond the EIB Group<sup>26</sup>, involving various implementing partners such as national promotional banks and international financial institutions, as for example the European Bank for Reconstruction and Development (EBRD), the Council of Europe Development Bank (CEB) or the Nordic Investment Bank (NIB). The wider set of implementing partners is a key difference to EFSI.

Further, the project preparation and advisory support complementing InvestEU, the InvestEU Advisory Hub, is open to partnerships with national promotional banks that are not implementing partners. This partnership framework in financing and project preparation is an innovation vis-à-vis EFSI, which had supported EIB Group operations alone and whose advisory services were and are managed only within, and by, the EIB Group.

However, the limited public funds supporting InvestEU could pose a challenge in attracting transformative investments and sharing risks effectively. Some critical green transition projects may not be suitable for InvestEU financing, especially those lacking commercial viability.

While effective in unlocking investments for lower-risk projects like retrofitting buildings to increase energy efficiency, InvestEU's high leverage structure has limitations. It tends to prioritize projects with short-to-medium-term cash flows, relying on indirect instruments like loan guarantees.

Accountability and transparency issues also plague InvestEU. Furthermore, the lack of transparency makes it challenging to assess whether investments align with EU climate policies. The European Commission has not adequately published data through its climate tracking system, as legally required. Confidentiality further obscures the scrutiny of InvestEU's climate impact and the destination of intermediated funds.

To address this, the Commission should disclose how much financing aligns with the EU taxonomy for sustainable activities<sup>27</sup> and report on the actual climate-related outcomes of its financing operations, such as reductions in greenhouse gas emission (Findeisen and Mack, 2023).

Since InvestEU only started in 2021, it is too early to assess the risk profile of projects at the time of writing.

## **NextGenerationEU (2021-2026)**

### *Description*

NGEU is a temporary recovery instrument to support the economic recovery from the Covid-19 pandemic and build a greener, more digital and more resilient future for the EU. The programme is worth €806.9 billion as of 2023 and is scheduled to operate from 2021 to 2026. It is financed by the issuance of bonds and by the EU budget.

More than 50 percent of the long-term budget and NextGenerationEU are supporting modernisation, for example through: research and innovation (via Horizon Europe), fair climate and digital transitions (via the Just Transition Fund and the Digital Europe programme), preparedness, recovery and resilience (via the Recovery and Resilience Facility, rescEU and a new health programme, EU4Health).

In addition, the package pays attention to: modernising traditional policies, fighting climate change, and biodiversity protection and gender equality. The centrepiece of NGEU is the Recovery and Resilience Facility (RRF) – an instrument that provides grants and loans to support reforms and investments in the EU member states which is worth €723.8 billion.

Part of the NextGenerationEU, funds are also being used to reinforce several existing EU programmes, such as REACT-EU (€50.6 billion), Just Transition Fund (€10.0 billion), Rural Development (€8.1 billion), InvestEU (€6.1 billion), Horizon Europe (€5.4 billion) and RESCEU (€2 billion). We will here mainly talk about the RRF of which €385 billion of funds is given out in loans and €338 billion of funds in grants.

Under the programme's centrepiece, the RRF, the EU will distribute €385 billion of funds in loans and €338 billion in grants. To benefit from support under the Facility, EU governments have submitted national Recovery and Resilience Plans (RRPs), outlining the reforms and investments they will implement by end-2026, including clear milestones and targets.

The plans had to allocate at least 37 percent of their budget to green measures and 20 percent to digital measures. The Recovery and Resilience Facility is performance based. This means that the Commission only pays out the amounts to each country when they have achieved the agreed milestones and targets towards completing the reforms and investments included in their plan.

### *Implementation*

The latest report from the European Commission, dated 25 September 2023, regarding the implementation of the RRF, reveals various outcomes. Until December 2022, the RRF had helped 1.43 million enterprises either through monetary or in-kind support and in the second half of 2022, over 4 million people have been trained with RRF support.

Moreover about 22 million megawatt hours (MWh) of savings in annual energy consumption were achieved by the end of 2022. Major progress has been made in (i) the continuous implementation of the RRF, (ii) increasing the transparency around its implementation, and (iii) protecting the financial interests of the EU by stepping up control and audit efforts.

Some member states are facing challenges in administering funds, partly due to administrative capacity issues or investment bottlenecks. Some other member states are facing difficulties in implementing the RRPAs as initially designed due to changes in economic circumstances such as high inflation or supply bottlenecks.

The Commission is supporting all member states to accelerate the implementation and revision of their plans, including through the Technical Support Instrument. The revisions of RRPAs and the addition of REPowerEU chapters have also impacted the disbursement schedule of RRF funds, as the first half of 2023 has seen a slowdown in the submission of payment requests, with member states focusing their efforts on the revision of plans and the addition of REPowerEU chapters.

In 2023, the Commission made also significant efforts to increase the clarity and transparency around the Facility's implementation. The Commission published, on 21 February 2023, its methodologies on (i) assessing the satisfactory fulfilment of milestones and targets, and (ii) calculating the suspended amounts in case of non-fulfilment of a milestone or target. Furthermore, the amendments to the RRF Regulation require member states to publish information on the 100 final recipients receiving the highest amounts of RRF funding.

One point of discussion is the evaluation of member states performances. NGEU is supposed to be a performance-based programme, in the sense that disbursement of funds is conditional on countries achieving milestones and targets. But as mentioned by Darvas *et al* (2023a), Article (2) of the regulation defines 'milestones and targets' as "*measures of progress towards the achievement of a reform or an investment.*"

The expression "*measures of progress towards*" thus indicates a process, not necessarily the achievement of results. This is also observed by the European Court of Auditors (2023). Therefore, a clearer definition of 'performance-based' is needed, and should be based on output not processes.

There is also discussion surrounding whether the milestones and targets set aren't sufficiently ambitious. As mentioned in Corti *et al* (2023), Italy will successfully fulfil the milestones and targets but will likely not achieve the objectives of the measures included in its RRP – namely reducing regional and local inequalities in the provision of employment and childcare services. This could indicate that milestones and targets defined under RRF are too easy to achieve.

## REPowerEU (2022-2026)

### *Description*

REPowerEU, focuses predominantly on enabling an orderly and affordable phase-out of Russian gas by 2027. The plan covers four main areas: energy efficiency and savings; energy supply diversification; clean-energy transition acceleration; and investment and reform.

The REPowerEU plan has required massive investments and reforms. The EU has mobilised close to €300 billion - approximately €72 billion will be in grants and approximately €225 billion in loans (these are the loans that were uptaken in the RRF and is thus not new money).

This will include approximately €10 billion in missing links for gas and liquefied natural gas and up to €2 billion for oil infrastructure to end the import of Russian oil. The rest of the financing, 95 percent of the initial €300 billion, will go into speeding up and scaling up the clean energy transition. An extra €210 billion will be needed to achieve the programme objectives.

The Recovery and Resilience Facility (RRF) is at the heart of this funding. The REPowerEU proposal encourages member states to use their national recovery and resilience plans (RRPs) as a strategic framework for reforms and investments to ensure joint European action for a more resilient, secure and sustainable energy system. In order to align with RePowerEU, revisions to RRP<sup>s</sup> would incorporate new measures within a dedicated REPowerEU chapter.

### *Implementation*

The European Court of Auditors (2022) pointed out in a report the limits to REPowerEU. Whilst REPowerEU targets the EU as a whole, the RRF is implemented through measures put forward by member states. This poses a risk in terms of the strategic response to the challenges ahead and may favour the priorities of individual member states rather than those of the Union as a whole.

The limited timeframe of the RRF in combination with the time needed to submit and approve the amendments to the RRP<sup>s</sup> may not be suitable for the some of the REPowerEU objectives. The preamble of REPowerEU (Regulation (EU) 2023/435) states that "*reforms and investments set out in the REPowerEU chapters which are necessary to improve energy infrastructure and facilities to meet immediate security of supply needs for gas should be eligible for financial support under the Facility even if they do not comply with the principle of 'do no significant harm.'*"

The REPowerEU targets are likely to have an impact on the environment and thus there might be a trade-off between the objective of secure energy supply and environmental and climate concerns, at least in the short run. However, given the strong focus in the RRF on green targets and climate, introducing an exemption from the principle of 'do no significant harm' may jeopardise one of its core values.

Thus, it may be useful at least to have an indication of the impact of potentially harmful measures to select those which represent an acceptable level of environmental and climate impact compared to the value added they

are expected to bring to the REPowerEU objectives. The fact that the REPowerEU chapters may be submitted at different times further impairs the inclusion of crossborder projects in RRPAs.

## STEP (2023-2027)

### *Description*

STEP seeks to reinforce, leverage and steer EU funds to investments in deep and digital, clean and bio technologies in the EU, and in people who can implement those technologies into the economy. By strategically leveraging existing programmes like InvestEU, Innovation Fund, Horizon Europe, EU4Health, Digital Programme, European Defence Fund, Recovery and Resilience Facility, and cohesion policy funds, STEP anticipates generating up to €160 billion in new investments.

This ambitious programme will be funded with €14.5 billion from the EU Budget, implemented by an additional €7.5 billion EU guarantee into InvestEU, €0.5 billion allocated to Horizon Europe, €5 billion to the Innovation Fund, and €1.5 billion to the European Defence Fund.

### *Implementation*

Climate Action Network (2023) Europe has highlighted several drawbacks associated with STEP. Firstly, there is no assurance that the supported investments will adhere to the do no significant harm principle. Additionally, STEP does not explicitly focus on climate action or directly contribute to achieving Green Deal objectives, contrary to the initial vision outlined in the Green Deal Industrial Plan.

Instead, it encompasses a broad spectrum of 'strategic' technologies. Lastly, it doesn't introduce new EU resources; rather, it reorganizes and repackages existing ones.

## Connecting Europe Facility (2021-2027)

### *Description*

CEF supports the deployment of high-quality, sustainable infrastructure in the transport, energy and digital sectors by encouraging both public and private investment. The CEF benefits people across all member states, as it makes travel easier and more sustainable, it enhances Europe's energy security while enabling wider use of renewables, and it facilitates crossborder interaction between public administrations, businesses and citizens.

It is divided into three components: transport, energy and digital. The energy budget of €5.84 billion should help the transition towards clean energy and complete the Energy Union, making the EU energy systems more interconnected, smarter and digitalised. The budget for CEF Transport is of €25.81 billion (including €11.29 billion for cohesion countries).

CEF Transport focuses on crossborder projects and projects aiming at removing bottlenecks or bridging missing links in various sections of the Core Network and on the Comprehensive Network. The budget for CEF Digital is of €1.8 billion and is managed by Health and Digital Executive Agency (HaDEA).

### *Implementation*

CEF shall contribute, through its actions, 60 percent of its overall financial envelope to climate objectives. Implementation of the programme's 2014-2020 actions has also been directly impacted by COVID and geopolitical

crisis in Ukraine, thus it is too early to conclude whether the programme's targets will be achieved as the nature of large-scale infrastructure projects makes it difficult to already present information.

## Digital Europe Programme (2021-2027)

### *Description*

It focuses on bringing digital technology to businesses, citizens and public administrations. It will not address these challenges in isolation, but rather complement the funding available through other EU programmes, such as the Horizon Europe programme and the Connecting Europe Facility for digital infrastructure, the Recovery and Resilience Facility and the Structural fund. With a planned overall budget of €7.5 billion the Digital Europe Programme will support projects in five key capacity areas: in supercomputing (€2.7 billion), artificial intelligence (€2.5 billion), cybersecurity (€2 billion), advanced digital skills (€700 million), and digital transformation of public administration and interoperability (€1.3 billion).

### *Implementation*

Implementation is on track. Most projects implemented via grants or joint procurement will start implementation in early 2024. However, with the Russian invasion in Ukraine many countries had to reprioritise investments in other areas and some proposals have been affected mainly those that needed more national support.

## Social Climate Fund (2025-2032)

### *Description*

The Social Climate Fund will finance temporary direct income support for vulnerable households and support measures and investments that reduce emissions in road transport and buildings sectors and as a result reduce costs for vulnerable households, micro-enterprises and transport users. It should be implemented in 2025 and expect a budget of €23.7 billion for 2025-2027 and €48.5 billion 2028-2032.

The fund is based on the revenues of the Emissions Trading System 2 (ETS 2), covering fuel combustion in buildings, road transport and additional sectors (mainly small industry not covered by the existing).

### *Implementation*

As pointed out by the European Economic and Social Committee (2021), stakeholders have been sceptical and even negative about extending emissions trading to buildings and road transport, pointing to the expected social and economic impact of an increase in heating and fuel prices on financially weaker households, medium-, small- and micro-enterprises and transport users.

Moreover, the fund is only partially dedicated to social compensation it also focuses on incentives of EV and decarbonisation. Furthermore, it is quite surprising that a fixed amount of €72.2 billion is proposed whereas it will be based on a volatile EU ETS market.

## **European Structural and Investment Funds (2014-2020)**

### *Description*

The European Structural and Investment Funds (ESI Funds) comprise five different funds and tries to increase smart, sustainable and inclusive growth, strengthen the institutional capacity of public administration, step up territorial and urban development and territorial cooperation.

The five funds, part of the MFF, included are the European Regional Development Fund (ERDF), European Social Fund (ESF), Cohesion Fund, European Agricultural Fund for Rural Development (EAFRD), European Maritime and Fisheries Fund (EMFF). The policy objectives pursued with the ESI Funds include: research and innovation, digital technologies, supporting the low-carbon economy, sustainable management of natural resources, small businesses, smart, sustainable and inclusive growth, employment, better education and training, strengthening the institutional capacity of public administration and urban development and territorial cooperation (Interreg).

### *Implementation*

The 2014-2020 financial period ends at the end of 2023 under the so-called N+3 rule. End 2021, the ESI Funds unleashed a total investment of €731 billion, of which €535 billion was funded by the EU. The funds supported more than 4 million businesses and created over 310 000 new jobs, maintained over 44 000 jobs and created over 6 000 new jobs in the fishing and aquaculture sector.

It improved the energy efficiency of 460 000 households and increased the energy production capacity coming from renewable energy resources by more than 3 600 MW (the equivalent of around 1 800 wind turbines). Moreover, 55.2 million participants benefitted from the ESF and Youth Employment Initiative supported projects and ESI Funds helped 55.2 million people through employment, social inclusion, or education actions.

It also supported over 2.3 million projects in the agricultural sector and rural areas. Finally, 64 percent of the total rural population is covered by more than 3 650 LEADER Local Action Groups implementing Local Development Strategies supported by the EAFRD.

## **European Social Fund Plus (ESF+) (2021-2027)**

### *Description*

It corresponds to the main instrument for investing in people. With a budget of almost €99.3 billion for the period 2021-2027, ESF+ provides an important contribution to the EU's employment, social, education and skills policies, including structural reforms in these areas.

The majority of funding under the ESF+ (€98.5 billion) will be allocated under shared management with the member states. This means that the ESF+ Managing Authorities in each country will dedicate the money to projects that are run by a range of public and private organisation and responding to the country- and region-specific needs.

In addition to the shared management strand of the fund, the European Commission directly manages a smaller share (€762 million) of the ESF+ under the Employment and Social Innovation (EaSI) Strand. This side of the fund will support analytical activities, capacity building and transnational/crossborder cooperation to strengthen social protection and social inclusion, fair working conditions, equal access to the labour market, social entrepreneurship and labour mobility.

ESF+ brings together four funding instruments that were separate in the programming period 2014-2020: the European Social Fund (ESF), the Fund for European Aid to the most Deprived (FEAD) the Youth Employment Initiative and the European Programme for Employment and Social Innovation (EaSI).

In member states where the number of NEETs is above the EU average, 12.5 percent of the fund will be spent on combating youth unemployment. At least 25 percent of the budget is to be spent on promoting social inclusion, including the integration of non-EU nationals and at least 3 percent of the budget is to be spent on food aid and basic material assistance for the most deprived.

Similarly, member states with a level of child poverty above the EU average must use at least 5 percent of their ESF+ resources to address this issue.

#### *Implementation*

Due to the late adoption of the ESF+ in 2021, its implementation had a slow start in 2022. In total, nine countries (CZ, EL, HR, HU, LT, PL, RO, SI, and SK) transferred ESF+ budget to the ERDF and the CF, amounting to a total transfer of €3.9 billion. The transfers from other funds to the ESF+ amounts to €1.4 billion in total.

Gender equality is one of six thematic enabling conditions used for the first time in the 2021-2027 period. That means that gender equality is a prerequisite for the effective and efficient implementation of the specific objectives of the fund(s).

Performance assessments for the shared management strand and the direct management strand of the ESF+ will be provided once the implementation has taken off in 2023.

## Innovation Fund (2018-)

### *Description*

The Innovation Fund will contribute to greenhouse gas reduction by helping create the right financial incentives for new investments in the next generation of technologies needed for the EU's low-carbon transition. It is designed to take into account the lessons learned from its predecessor, the NER300 programme.

The EU Emissions Trading System (EU ETS) provides the revenues for the Innovation Fund from the monetisation of 530 million ETS allowances. The unspent funds from the NER300 programme, the Innovation Fund's predecessor, were also transferred to the Innovation Fund. The Innovation Fund's total funding depends on the carbon price, and it is estimated to about €40 billion from 2020 to 2030.

### *Implementation*

A report by the think tank Sandbag (2023)<sup>28</sup>, specialised in climate policy, pointed out some drawbacks of the Innovation Fund. They claim that grants made under the Innovation Fund should exclusively consider the value at technological risk, rather than the degree of innovation and that it should avoid upfront funding except for projects with a high technology risk.

Moreover, for a project's greenhouse gas (GHG) avoidance estimates to be as accurate as possible, they should be i) reviewed by the whole panel of experts, not just one ii) independently estimated by the expert panel for use in the rating of the other criteria using this information and iii) assess with reference to updated benchmarks to ensure a project's innovativeness and contribution to emissions avoidance.

## **Horizon Europe (2021-2027)**

### *Description*

The EU's key funding programme for research and innovation with a budget from €95.5 billion. The programme facilitates collaboration and strengthens the impact of research and innovation in developing, supporting, and implementing EU policies while tackling global challenges (climate changes, UN's Sustainable Development Goals). It supports creating and better dispersing of excellent knowledge and technologies. It is the follow-up of Horizon 2020.

Horizon Europe consists of three pillars and one horizontal activity: €23.5 billion is allocated to Pillar I Excellent Science, €47.4 billion for Pillar II 'Global Challenges and European Industrial Competitiveness', €11.9 billion for Pillar III 'Innovative Europe' and €3.2 for Part 'Widening Participation and Strengthening the ERA'. Grants are the main form of support.

### *Implementation*

Only 7 percent of Horizon Europe spending has been allocated to address biodiversity for the 2021-2022 period whereas target is 10 percent so need more efforts to address this issue.

## **REACT-EU (2021-2023)**

### *Description*

An initiative that continues and extends the crisis response and crisis repair measures delivered through the Coronavirus Response Investment Initiative and the Coronavirus Response Investment Initiative Plus.

Only implemented from 2021 to 2022 and financed by NGEU with a budget of €50.6 billion. REACT-EU captures only national-level data on the pre-pandemic situation and on the economic impact of the crisis on member states.

Spain and Italy, each with an allocation of more than €14 billion, are by far the two main recipients and together account for 57 percent of the total budget. In 2021 (€39.6 billion) and the rest in 2022 (€10.8 billion).

REACT-EU is not a new funding source, but a top-up to 2014-2020 European Regional Development Fund and European Social Fund allocations. It is delivered under shared management. This initiative will support investment projects that foster crisis-repair capacities and contribute to a green, digital and resilient recovery of the economy, including support for maintaining jobs, short-time work schemes and support for the self-employed.

However, it is not limited to that and can also support job creation and youth employment measures, healthcare systems and investment support for small and medium-sized enterprises.

#### *Implementation*

One and a half years after the start of REACT-EU, as of 30 June 2022, some member states still had large amounts to allocate, such as Ireland and Portugal with 38 percent and 25 percent unprogrammed resources respectively. At that date, only 24 percent of REACT-EU's allocation had been paid to member states.

The risk is that there will be a rush to spend available resources before the end of the period, potentially leading to insufficient attention being paid to performance and value for money considerations.

## ERDF/Cohesion Fund

### *Description*

ERDF is intended to help to redress the main regional imbalances in the Union. The Cohesion Fund provides support to member states with a gross national income (GNI) per capita below 90 percent EU27 average to strengthen the economic, social and territorial cohesion of the EU.

With a total budget of €274 billion, from which €48 billion for the Cohesion Fund and €226 billion for the ERDF. The Cohesion Fund contributes to environmental and trans-European transport network (TEN-T) infrastructure projects. The ERDF contributes to reducing disparities between the levels of development of the various EU regions, including by promoting sustainable development and addressing environmental challenges.

### *Implementation*

The ex-post evaluations of the 2014-20 period shall be completed by the end of 2024.

### **Appendix 3. Case studies of national public investment management**

The following section reviews good practices of public investment management with respect to the principles written by the (OECD, 2014).

### **Netherlands**

In the Netherlands, several good practice examples of public investment management can be underlined. One example is the MIRT, which stands for Multi-Year Programme for Infrastructure, Spatial Planning, and Transport.

This involves projects where national and regional governments work together to improve the country's competitiveness, accessibility, and quality of life. The Ministry of Infrastructure and Water Management is involved, but other ministries and regional partners like provinces, municipalities, and NGOs can also join in.

The OECD also suggests effective coordination across government levels (Principle 2). In the Netherlands, a good example referring to this is the Association of Dutch Municipalities (VNG) that unites all municipalities, and the Association of Provinces (IPO) which looks after the provinces. Both focus on mutual learning and exchanging experiences. IPO's main job is representing the interests of provinces in national and EU processes.

With respect to Principle 4, when selecting projects, the Ministry of Infrastructure and the Environment have several criteria for selecting infrastructural projects to be (co-)funded by national government. One of them is the National Market and Capacity Analysis (NMCA).

The latter indicates where infrastructure capacity is not expected to be sufficient to reach the goals of National Policy Strategy for Infrastructure and Spatial Planning (i.e. the target values for traveling time), taking into account the expected development of mobility.

Netherlands have been particularly efficient in water management. One reason behind this is the Rijkswaterstaat (RWS), which is the executive organization of the Ministry of Infrastructure and Water Management. Rijkswaterstaat manages, maintains, and develops the three major infrastructure networks of the Netherlands: the main road network, the main waterway network, and the main water system.

It is RWS's goal to assess bids by the total cost of construction and maintenance, using life cycle costing and total cost of ownership concepts. To calculate life cycle costs, RWS has developed the DuboCalc software, which

allows to calculate the environmental effects of a material, building or method. The software calculates life cycle environmental impacts in 11 areas using a life cycle assessment (LCA) database, converting these impacts into an environmental cost indicator (ECI) value for the proposed design. The materials proposed by the successful bidder become contract requirements and the ECI value of the final product is checked upon completion of the work.

## UK

In the UK, we can put forward several good practice examples of public investment management. With respect to Principle 6 on mobilising private actors, an example can be the Private Finance Initiative. Private Finance Initiative (PFI) projects are a type of public-private partnership (PPP), used to fund major capital investments. PPPs refer to a wide range of different types of collaboration between public and private bodies.

The UK has been at the forefront of using PFIs to deliver public investment projects. However, it has also been majorly criticised for hugely raising costs of projects and in October 2018, the then-Chancellor Philip Hammond announced that the UK government would no longer use PFI<sup>29</sup>.

The Office for National Statistics has developed over many years a comprehensive set of comparable statistics at neighbourhood level (municipalities). These publicly available data have been used both in national and local policies and as a decision tool by citizens.

Moreover, a Cities Policy Unit was created in 2011 with public, private, central and local stakeholders to help co-ordinate urban policy. The goal of the Cities Policy Unit is to work with both cities and government to help cities create new ideas and turn the ideas into successful plans.

Both these initiatives are a good example of Pillar 1 which focus on coordination across governments and policy areas. Since late 2011, urban policy has been centred on a growing number of City Deals in England that are being implemented in waves.

These deals are agreements between government and a city and allow a greater degree of responsibility to English cities. City deals require better horizontal (across departments) and vertical (between the government and the cities) coordination, and local capacity.

To engage public, private and civil society stakeholders throughout the investment cycle (Principle 5), the UK uses Local Strategic Partnership (LSP). Which is a non-statutory body that brings together different parts of the public, private, voluntary and community sectors working at a local level. They have no legal powers or resources of their own.

To mobilise private actors and to diversify the sources of funding (Principle 6), the government launched Local Enterprise Partnerships (LEPs). These partnerships between local authorities and businesses decide on local priorities for investment in roads, buildings and facilities.

What concerns Principle 9, the UK has a fiscal framework to support debt sustainability and affordability (IMF, 2022). The revised Charter for Budget Responsibility sets out how UK's management of public finances operate.

The Charter do not set numerical debt targets or limits but includes a fiscal mandate to have public sector net debt (excluding the Bank of England) as a percentage of GDP falling by the third year of the rolling forecast period. Then there is also the Office of Budget Responsibility (OBR) that provides authoritative independent fiscal forecasts and assesses the long-term sustainability of public finances.

The OBR produces detailed five-year forecasts for the economy and public finances twice a year, which the government uses to produce its Autumn and Spring Budget documents.

Finally, the UK also has a medium-term fiscal framework (MTFF) that aligns budget preparation and public investment plans with fiscal policy. The Charter of Budget Responsibility stipulates how the MTFF works and the interaction between the Treasury and the OBR during the budget process.

In 2020, was presented the National Infrastructure Strategy (NIS). The latter plans to transform UK infrastructure to level up the country, strengthen UK's Union and achieve net zero emissions by 2050. The NIS is thus the overarching plan for economic infrastructure and encompasses investment across transport, energy, water and wastewater, waste, flood risk management, and digital communications.

## **Italy**

In Italy several good practice examples of public investment management can be highlighted. The existence of the Inter-ministerial Committee for Economic Planning (CIPE) is a good example with respect to Principle 1 of the OECD.

CIPE is the main body responsible for the coordination and horizontal integration of national policies, as well as aligning Italy's economic policy with EU policies. It has been renamed into the Inter-ministerial Committee for Economic Programming for Sustainable Development (CIPESS), as of 1st January 2021.

The role of this Committee's mandate is to steer economic programming towards the National Sustainable Development Strategy objectives in the context of Agenda 2030. There also exist the 'Conference of Regions and

Autonomous Provinces' which ensures a political dialogue and vertical co-ordination between the regional and national governments.

It is a political body of coordination between the regions of Italy and their presidents. In fact, joint documents are prepared by the Conference and are later presented during the meetings of the State-Regions Conference and the Unified Conference.

Conform with Principle 3, Basilicata provides successful examples of horizontal co-operation across regions and across municipalities. A good example of horizontal co-operation is the Programme Agreement concerning the management of the water resources transferred from Basilicata to Puglia by the Ionico-Sinni water system signed in 1999.

Furthermore, to ensure a more efficient horizontal cooperation in 2014 the Delrio Law transformed the Provinces of Italy in a reduced number of broader administrative entities.

Finally, Basilicata also invested heavily in monitoring and evaluation to support decision makers. The regional level has a Public Investment Evaluation Unit (NVVIP) under the Department for structural funds, which is responsible for monitoring and evaluating all public investments in the region and for checking the consistency of strategic projects with respect to the regional development plan and the annual financial plan. The unit also performs impact evaluations of public investment projects on employment and production (Principle 8).

## Ireland

From the technical assistance report from the (IMF, 2017), several good practices of public investment management have been highlighted. The report points out the good alignment of investment and planning. The National Planning Framework and the National Development Plan 2021-2030 combine to form Project Ireland 2040.

The NPF sets the vision and strategy for the development of Ireland to 2040 and the NDP provides the enabling investment to implement that strategy. This could refer to the Principle 1 of the Recommendation of the OECD.

To ensure enhancing projects and a good programme governance Ireland has the National Investment Office and the government has recently implemented the External Assurance Process, which will allow for independent scrutiny of public projects at key decision-making stages of the project lifecycle which will ensure taxpayer's money is spent wisely and projects are delivered on time and on budget.

With respect to Principle 8 and Principle 10, thus to improve transparency and to learn from the past Ireland has updated the Spending Code that now requires publication of business cases and post-project reviews (Conroy *et al* 2021).

Furthermore, on recommendation of the IMF, Ireland has implemented an investment tracker which focuses mainly on projects and programmes with costs greater than €20 million. The tracker serves to highlight the diverse range of infrastructural projects throughout Ireland.

An example of good practice of Principle 6 on mobilising the private sector is the Construction Sector Group. The Construction Sector Group was set up in 2018 tasked with maintaining a sustainable and innovative construction

sector that would be able to deliver on long-term commitments. The Construction Sector Group is chaired by the Secretary General of the Department for Public Expenditure and Reform.

Principle 7 states to reinforce the expertise of officials and institutions to have a better management of public investment. A good example of practice is the Irish Commercial Skills Academy (CSA) that was setup in 2019.

The CSA offers training on best practice approaches for effective delivery throughout the lifecycle of a project. Their aim is to enhance the skillsets of key spending departments and public sector bodies. Or for example the InfraNet. The latter is a forum for experts to critically examine public investment governance, reforms and innovations. The goal is to engage with experts in public sector and delivery bodies to share best practice, issues and solutions.

Finally, to align with Principle 4, there exist the Irish Government Economic and Evaluation Service (IGEES). The IGEES seeks to improve policy formulation and implementation by providing and building economic and analytical expertise across the Irish civil service (OECD, 2020).

## France

To align with Principle 8, in 2012 the French government took the decision<sup>30</sup> to subject all public projects of a certain importance to a socioeconomic assessment that until than was reserved for certain areas such as transport. It has been based on two pillars (Baumstark et al, 2021). The support of project leaders and the organization of counter-expertise was ensured by CGI (now SGPI).

In the analysis of public investment management in France, the roles of key entities, namely BPI France, CDC, and SGPI, are pivotal.

The *Secrétariat général pour l'investissement* (SGPI) is a good example the practice Principle 1 and Principle 2. SGPI has a central role in ensuring coherence in the state's investment policy. It is involved in the decision-making processes related to contracts between the state and investment management entities and also coordinates the preparation of project specifications and monitors their alignment with government objectives.

Moreover, it is responsible for the overall evaluation of investments, both before and after implementation. Finally, it compiles annual reports on programme execution and supported ministerial evaluation mechanisms. The SGPI, under the authority of the Prime Minister, is responsible for ensuring the coherence and monitoring of the State's investment policy through the implementation of the France 2030 plan.

This unprecedented plan builds on the achievements of the Programmes of Investments for the Future (PIA), notably PIA 4, endowed with €20 billion. France 2030 is overseen by the SGPI on behalf of the Prime Minister and implemented by the Agency for Ecological Transition (Ademe), the National Agency for Research (ANR), Bpifrance, and the Banque des Territoires.

In the past, SGPI had a primordial role in the implementation of the European instrument, EFSI, in France. This institution was able to communicate around EFSI towards project promoters, act as a contact point and monitor and issue brochures of EFSI projects being financed. This is believed to have fostered ownership of EFSI in France (Wilkinson *et al* 2022).

Bpifrance and *Caisse des Dépôts et Consignations* (CDC) are examples on how to mobilise financial institutions for a better management of public investment (Principle 6). CDC is a special institution responsible for administering deposits and consignments, providing services relating to the funds entrusted to its management, and performing other legally delegated functions of a similar nature.

It is responsible for protecting popular savings, financing social housing and managing pension funds. It also contributes to local and national economic development, particularly in the fields of employment, urban policy, the fight against banking and financial exclusion, business creation and sustainable development.

This group carries out tasks in the public interest that support public policies pursued by the State and local communities. It supports the housing sector, the regions (Banque des Territoires), the environment, financing businesses and the daily lives of French people (Cyclade, Mon compte formation).

Bpifrance is a French public sector investment bank. It is a joint venture of two state owned enterprises: the CDC and EPIC BPI- Groupe (formerly EPIC OSEO). Bpifrance's goal is to favour the growth of the French economy by helping entrepreneurs thrive. It plays a significant role in the management of public investment.

Bpifrance's 2022-2025 strategic plan covers the priorities of the France 2030 Investment Plan. Bpifrance as main operator for financing the Investments for the Future Programme for French startups, SMEs, and intermediate-sized enterprises was and is still very successful.

Another example on the efficiency of the French government on mobilising financial institutions (Principle 6) is the Agence France Locale created in 2013. Agence France Locale is 100 percent owned by French local authorities. Its mandate is to raise cost-efficient resources in capital markets by pooling together the funding needs of all member local authorities. It aims to provide French local authorities with alternative funding sources.

A more precise example of Principle 3, to ensure a coordination across subnational governments, in France is the state-region planning contracts (OECD, 2017). The *Contrat de plan État-région* (CPER) have been in operation since 1982 and are important tools in regional policy in terms of planning, governance and co-ordination.

In 2016 the State-Metropoles Pacts was launched, which aim at empowering new sub national entities, the metropoles (MAPTAM law, 2014). They will support urban innovation at the metropolitan scale through financial partnering in some key investments.

An example of good practice of Principle 2 in France is the public establishment for inter-municipal co-operation (EPCI). There are more than 36 000 communes in France and the government has long been against mergers and thus has encourages municipal cooperation.

There are about 1,254 EPCI with own-source tax revenues aimed at facilitating horizontal co-operation. They are governed by delegates of municipal councils and must be approved by the State to exist legally.

To encourage municipalities to form an EPCI, the central government provides a basic grant plus an 'inter-municipality grant' to preclude competition on tax rates among participating municipalities. EPICIs draw on budgetary contributions from member communes and/or their own tax revenues.

# Making industrial policy work



The decarbonisation of the automotive industry is creating a skills shortage. Conor McCaffrey and Niclas Poitiers argue for the EU to get more involved in skill policies

**T**he transition from cars powered by the internal combustion engine to vehicles powered by electric batteries implies a fundamental shift in the types of skills required by the automotive industry. However, the industry faces significant problems in finding suitable workers.

Surveys show that the lack of skilled labour is seen by firms as a problem of similar magnitude to high energy costs. Against the background a general skills shortage in the European Union, the shortage of skilled labour represents a major impediment to the development of a European battery industry.

The European Battery Alliance Academy is the main component of the EU's strategy for tackling this problem. It develops training courses and materials to assist local training providers and serves as a blueprint for skills policies in other industries. However, given the scale of the challenge, it represents more a symbolic than a substantive answer to the challenge.

More should be done. The limited powers of the EU in labour market policies hold up a union-wide solution. In the short term, the training programmes developed by the European Battery Alliance Academy<sup>1</sup> could more explicitly target demographics that are underserved by private training providers. In the medium term, the EU should rethink its labour market competences in order to develop a social pillar to underpin the European green transition.

## **1 Introduction**

Industrial policy<sup>2</sup> is back. Though the European Union has limited powers in relation to industry<sup>3</sup>, recent years have been marked by a shift towards targeted EU support for specific industries<sup>4</sup>. The European Chips Act (Regulation (EU) 2023/1781) and the proposed EU Net Zero Industry Act (NZIA) are the two most prominent examples of this change, with the range of measures introduced or planned including regulatory changes, public funding through national state aid and trade defence measures (see for example Kleimann *et al* 2023; Tagliapietra *et al* 2023; Poitiers and Weil, 2022a).

*Given the importance that companies, and especially SMEs, put on the shortage of available skilled workers, current policy responses are not satisfactory*

However, this shift has largely overlooked one of the primary production factors: labour. While the United States explicitly framed its Inflation Reduction Act (IRA) as a worker-centric industrial policy<sup>5</sup>, and the EU has also highlighted the importance of skilled workers in its industrial policy communications, the skills-relevant parts of these policy packages have arguably been underdeveloped.

This discrepancy is especially apparent in the lithium-ion battery industry, which manufactures the rechargeable batteries used to power electric vehicles (EVs). The automotive industry is one of the largest sectors in the EU, responsible for 10 percent of manufacturing employment<sup>6</sup>.

The shift from internal combustion engines (ICE) to electrification of the European automotive fleet necessitates massive investments and a fundamental shift in production technology. This implies stranded assets, in terms of both intellectual property and production facilities, but also in terms of skills.

Companies will not be able to capitalise on the ICE technology they developed in the past and workers who specialise in this technology will also find fewer opportunities to benefit from their skills. As part of its broader attempts to foster a domestic battery industry, the EU has put forward policies to develop the required skills, which are often put forward as a template for skills policies in other clean-tech industries.

However, as we discuss in this paper, despite the widely recognised importance of skills for industrial policy and the significant role that availability of skilled workers plays in investment decisions, the EU is yet to find a convincing strategy in this area.

Given their importance, making skills a more substantive pillar of EU industrial policy should be a priority. In this paper, we look at EU skills policies in the battery industry as an example for how skills policy in the EU currently works and how it could be improved. The European Battery Alliance Academy (EBA Academy) is the primary tool<sup>7</sup>.

It provides a cost-effective instrument aimed at addressing the expected skills shortage in this growing sector. However, more funding and care should be put, in particular, into targeting those workers who might not find training through private sector programmes.

Overall, we recommend that the role of the EU in skills policy be rethought, to establish a more direct link between EU green policies and labour-market opportunities.

## **2 Workers and industrial policy**

The relationship between industrial policy and labour markets can be seen from two perspectives: whether interventions can create jobs (treating employment as an output) or whether they can facilitate access to skilled labour (treating it as an input). These two perspectives are not mutually exclusive.

For instance, a skills shortage may occur in the short term before the growth of a targeted sector generates further employment. The EU's proposed Net Zero Industry Act walks a line between these two positions by emphasising that growing clean-tech industries in the EU "*requires significant additional skilled workers which implies important investment needs in re-skilling and upskilling*" but this also "*has a great potential for quality job creation*" (European Commission, 2023a, p.32).

However, assessing the relative importance and potential of the labour market as an input and output for industrial policy is important in framing the debate and determining policy priorities.

### **2.1 The labour market as an output?**

In some cases, an increase in employment in the targeted industries has been framed as one of the primary objectives of industrial policy. Perhaps the biggest proponent of this framing has been US President Joe Biden, who

has stressed repeatedly that one of the main goals of his green industrial policy is to revitalise the manufacturing sector and create jobs<sup>8</sup>.

Similar ambitions have been voiced by EU leaders, with Internal Market Commissioner Thierry Breton arguing that European industrial policy is needed to build a manufacturing base and create jobs for Europeans<sup>9</sup>.

However, the results of policies enacted thus far, as well as forecasts for future growth, cast doubt on the ability of industrial policy to act as an engine for job creation. Despite much fanfare, the 170,000 new jobs announced in the year following the passage of the US IRA failed to equal even an average month's net employment gains over the same period<sup>10</sup>.

Bistline *et al* (2023) forecast only limited employment gains, and even the study cited by the White House to advertise the IRA projected only 150,000 new manufacturing jobs by 2030 (Foster *et al* 2023). A literature survey by Cameron *et al* (2020) suggested that the net employment gains in the EU by 2050 from the green transition (the key aim of some EU industrial policies) will be positive but small.

For the battery sector, estimates vary but tend to suggest that the shift away from ICE automotives to EVs will have a net negative impact on employment in the European automotive value chain up until 2040<sup>11</sup>. This includes new jobs associated with the growth of the nascent lithium-ion battery sector.

Within this sector, batteries will become increasingly important as a share of employment: the International Energy Agency has estimated that, in a scenario of policies introduced to reach net zero emissions by 2050, EV and battery manufacturing jobs would make up over two-thirds of global automotive sector employment by 2050, up from just 8 percent in 2022 (IEA, 2023, Figure 1).

In other words, while expanding the European battery sector might fail to generate net employment growth across the automotive value chain, it could serve to mitigate the job losses expected from a decline in the ICE sector.

Given that the impact of the green transition on labour markets is expected to be uneven across various groups and locations (Vandeplas *et al* 2022), well-targeted green industrial policies could be used to avoid the negative local labour-market outcomes associated with previous energy transitions<sup>12</sup>.

However, from a macroeconomic perspective, the net employment benefits of industrial policy to the EU appear to be negligible. Therefore, from a European perspective, the focus should be on the labour market as an input for industrial policy.

## 2.2 A shortage of skilled workers

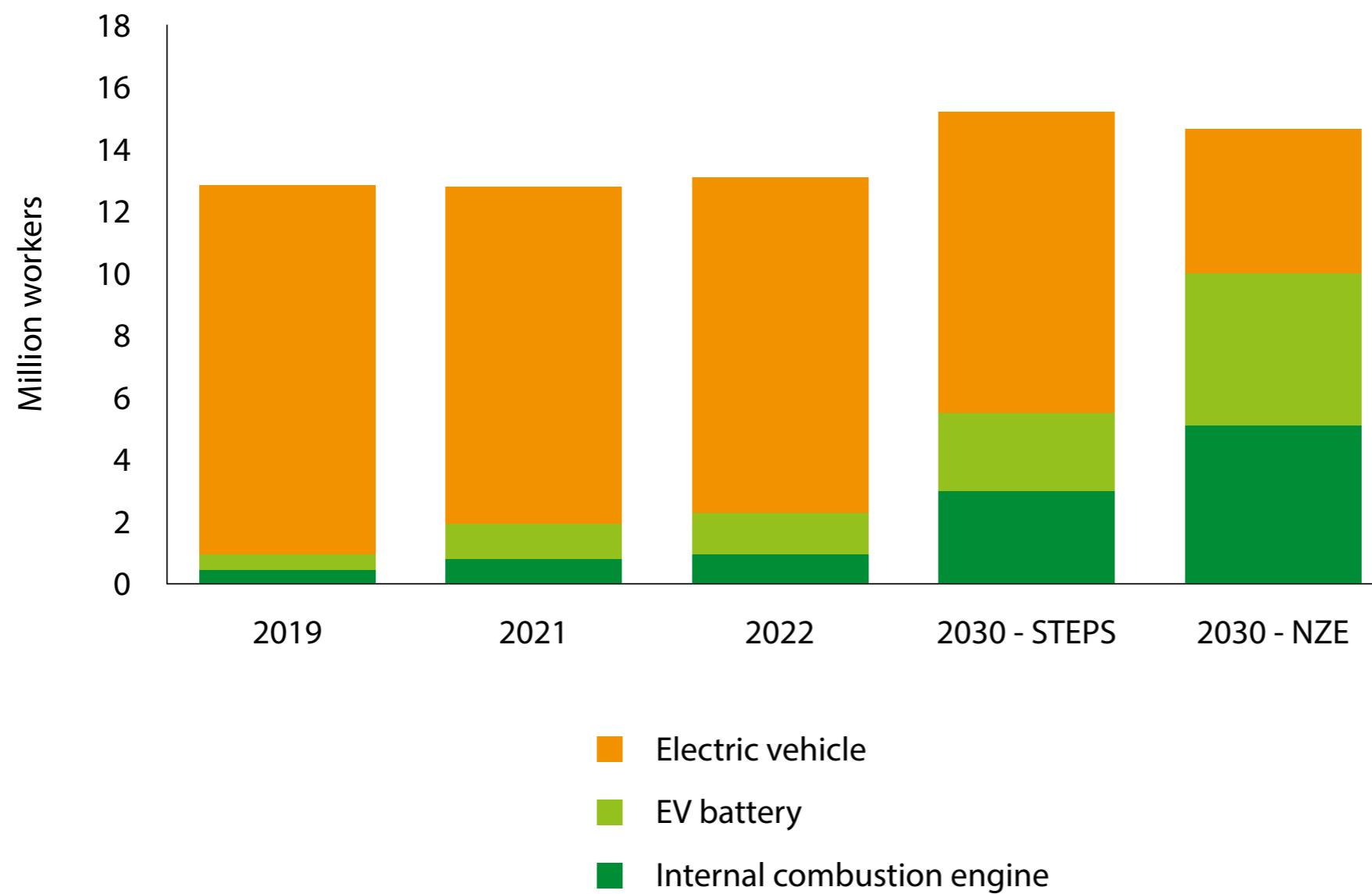
The ongoing skilled-worker shortage workers across the EU makes the need for skills-based policies as part of a European industrial policy more apparent.

Along with inflation and excessive burdens on firms, European Commission President Ursula von der Leyen has identified labour and skills shortages as one of the three major economic challenges for European businesses<sup>13</sup>. Former European Central Bank President and former Italian Prime Minister Mario Draghi has also pointed to a lack of skilled workers as a main weakness in the EU<sup>14</sup>. Firm-level surveys support these claims.

Over 80 percent of EU firms report that a lack of skilled workers represents either a major or minor obstacle to investment (Figure 2), with numbers broadly consistent across countries and economic sectors (EIB, 2023).

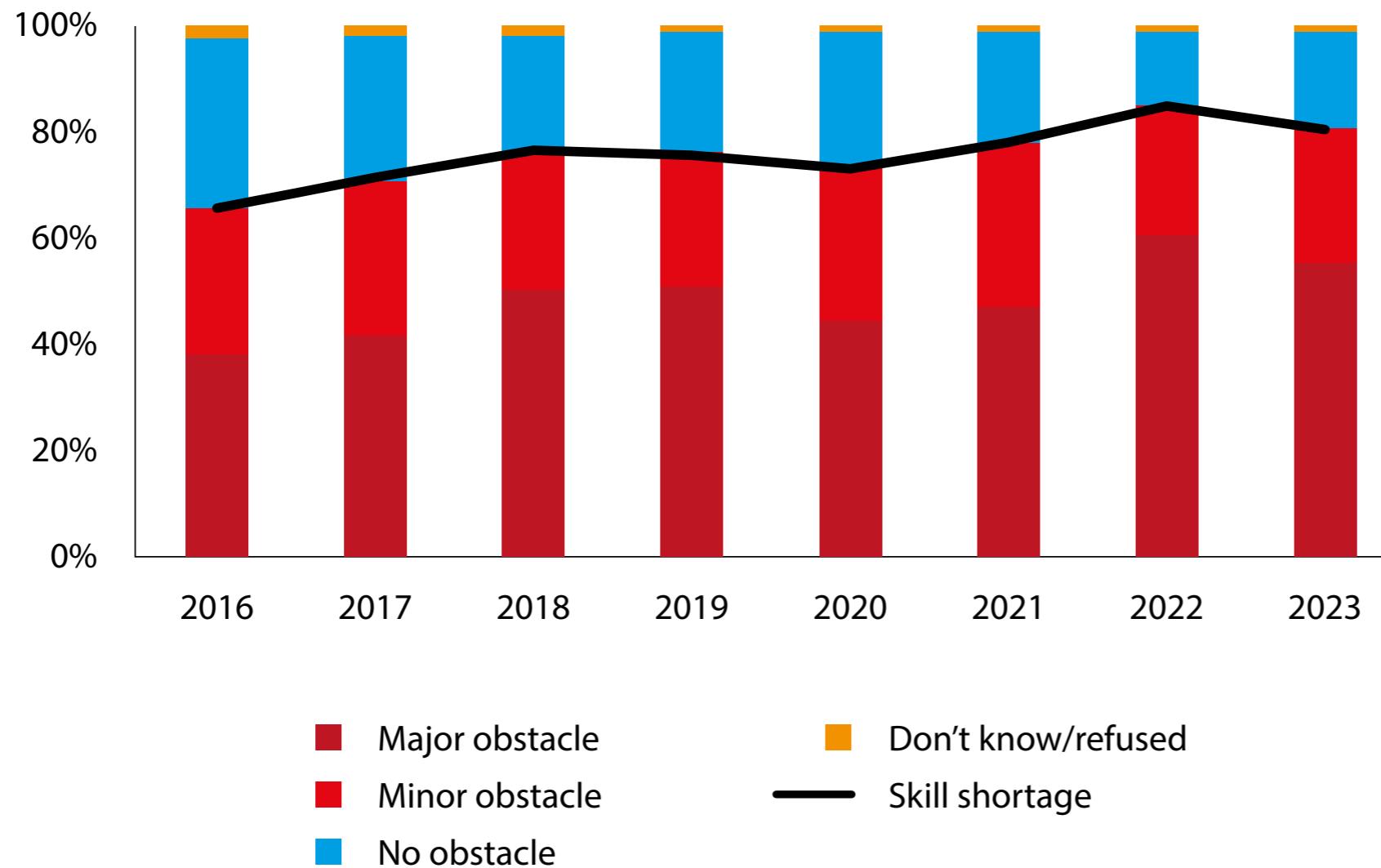
The share of companies reporting that this has been an obstacle rose from 65 percent in 2015 to over 80 percent in 2022, and the share of those identifying it as a major obstacle has risen strongly. When juxtaposed with other

**Figure 1. Estimated global employment in the automotive manufacturing sector**



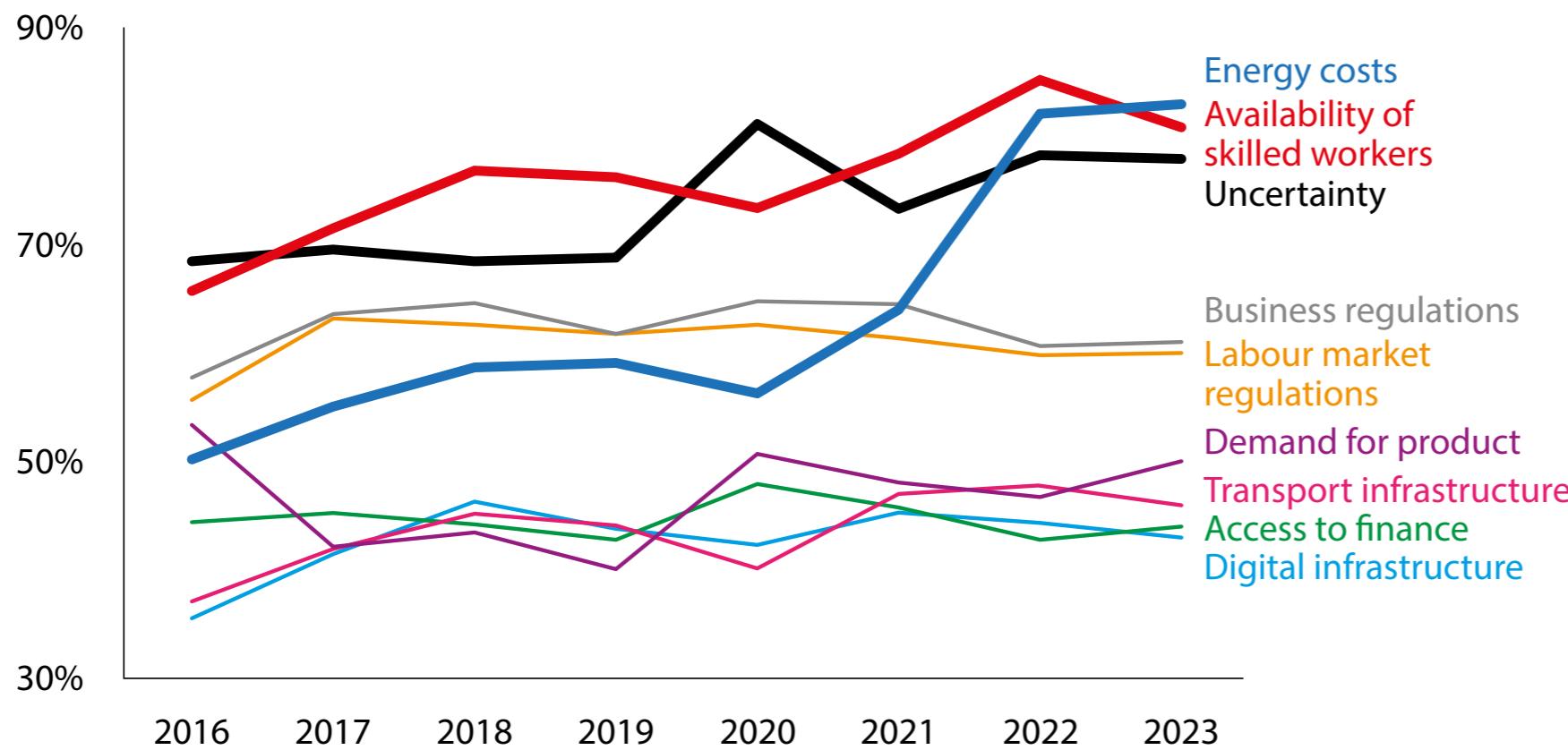
*Note: Electric vehicles include workers in battery supply chains. STEPS = IEA Stated Policies Scenario; NZE = IEA Net Zero Emissions by 2050 Scenario.  
Source: Bruegel based on IEA (2023).*

**Figure 2. The impact of a lack of skilled workers on European firms' investment decisions**



Note: Answers to "Thinking about your investment activities, to what extent is availability of staff with the right skills an obstacle? Is it a major obstacle, a minor obstacle or not an obstacle at all?". Skill shortage is the sum of those answering major obstacle or minor obstacle. The year refers to the survey year, with the reference year the previous calendar year.  
Source: Bruegel based on European Investment Bank Investment Surveys.

**Figure 3. Obstacles to EU firms' investment decisions**



Note: Answers to "Thinking about your investment activities, to what extent is an obstacle? Is it a major obstacle, a minor obstacle or not an obstacle at all?". Values reported are the sum of those answering major obstacle or minor obstacle for the given factor. The year refers to the survey year, with the reference year the previous calendar year.  
Source: Bruegel based on European Investment Bank Investment Surveys.

potential deterrents to investment, a lack of availability of skilled workers has ranked as one of the top two factors each year since the survey began (Figure 3).

According to the European Central Bank, labour, which encompasses associated costs, skills and shortages, was the most cited factor when firms were asked which factors would motivate shifts of production or operations out of the EU (Attinasi *et al* 2023).

Data from the November 2023 Eurobarometer survey on skill shortages further reinforces this point (Eurobarometer, 2023a). More than half (54 percent) of small and medium-sized enterprises (SMEs) and 72 percent of large companies (250 employees or more) across the EU reported that finding employees with the right skills was among their most serious problems; it was by far the most cited challenge, consistent across both countries and industrial sectors.

Both SMEs (38 percent) and large firms (41 percent) were most likely to answer that workers with vocational training were the most difficult to recruit, with more highly qualified workers apparently relatively less scarce<sup>15</sup>.

National reports stress the same message. For instance, the German Economic Institute reported a shortage of 600,000 workers across the German economy in 2022<sup>16</sup>. According to the Association of German Chambers of Industry and Commerce, as of November 2023, half of German firms faced labour shortages, with almost 2 million jobs unfilled across the economy<sup>17</sup>.

Similarly, in its European Semester 2023 country report, the European Commission blamed labour shortages in key industries in France for creating “*bottlenecks in the transition to a net zero-economy*” (European Commission, 2023b, p.15).

### **Box 1. Skills shortages versus labour shortages**

*Even if skill levels are excellent, it cannot compensate for a shortage of workers themselves. Part of the documented shortfall in skilled workers across Europe is a consequence of a very tight labour market in general, with both the employment and job vacancy rates (74.6 percent and 2.9 percent respectively) reaching all-time highs/lows in 2022 (European Commission, 2022b). When asked for the reasons behind the aforementioned labour shortage, the two dominant answers from SMEs were that applicants were insufficiently skilled or experienced (54 percent) but also that there were not enough applicants of any skill level (56 percent) (Eurobarometer 2023a).*

*Without wider measures to address labour supply in general, up- or re-skilling measures alone will not be enough to solve the widespread skilled labour shortages in the EU, especially considering that the ageing population will lead to a smaller EU labour force (European Commission, 2023d). However, given that industrial policy is intended to support selected industries, we focus on the challenge of equipping the particular workforce with the skills it needs, notwithstanding the wider challenge facing the EU.*

## 2.3 Battery sector

In the burgeoning battery sector, and indeed the clean-technology sector in general, the problem of skilled-labour shortage that we have documented seems to be even stronger.

While granular data is limited, available indicators suggest that the sectors critical to the green transition are experiencing growing labour shortages (European Commission, 2023c). As far back as 2018, the Strategic Action Plan on Batteries published by the European Commission identified a skills gap in the battery sector (European Commission, 2018)<sup>18</sup>.

In 2023, the Commission (2018, p.15) described the transport and storage (ie. batteries) sector as “*already experiencing persistent labour shortages*.” The same theme has been emphasised repeatedly by stakeholders in interviews. For instance, the CEO of Northvolt, one of the few large European battery producers, described in February 2023 labour issues as “*probably the number one limiting factor*” in their production<sup>19</sup>.

The largest labour demand in this industry is for vocationally trained workers, with approximately 85 percent of roles requiring this level of education and no more (Stolfa, 2023). This is also the level of education for which firms report having by far the greatest difficulties in recruiting (Eurobarometer, 2023a).

Just under half (49 percent) of SMEs operating in the mobility-automotive-transport industrial sector reported that they faced difficulties recruiting workers with vocational qualifications, more than double the share that reported the next most common education level of worker shortage<sup>20</sup>. This shortage in vocational roles is common across the clean-energy industry (IEA, 2023).

In the battery value chain, approximately 90 percent of the jobs created will be downstream, eg. in areas including electric vehicle manufacturing, installation and repairs (for a detailed breakdown of job positions in the downstream component see EIT InnoEnergy, 2023); see Box 2 for a description of the battery value chain).

The Commission often cites an estimate of 800,000 workers in need of up- or re-skilling across the battery value chain by 2025<sup>21</sup>. More interesting than the estimated figures<sup>22</sup> is the breakdown along the value chain, with approximately 90 percent of the estimated skill shortage in the downstream component (Fraunhofer Institute, 2021). The industry will require more mechanics and technicians than electrochemists, for example, and training programmes should be designed to reflect this.

This also highlights another uncomfortable reality for the sector: the EU is currently facing a severe shortage in relevant blue-collar positions, including motor vehicle mechanics and repairers, electrical engineering technicians and electrical mechanics and fitters (IEA, 2023). EU firms identified in particular technicians as a role in which there are shortages (Eurobarometer, 2023).

This also represents a challenge for policy measures as the less-educated and less-skilled workers who would be expected to fill these rolls have historically been less likely to undergo training (European Commission 2023d; Güner and Nurski, 2023).

Such challenges are not unique to the EU. Economies all over the world and specialising in different parts of the battery value chain have encountered similar problems. From extracting raw materials in the Democratic Republic of Congo or Australia, to battery production in South Korea, the US or Japan<sup>28</sup>, firms grapple with the challenges of finding skilled labour.

## **Box 2. The lithium-ion battery value chain**

*The value chain of lithium-ion batteries can be divided into three broad categories: upstream, battery production and downstream.*

**Upstream** encompasses the mining, processing and refining of raw materials; the workforce ranges from supply chain analysts to mining engineers<sup>23</sup>. **Battery production** entails firstly cell-component manufacturing, eg. the production of the cathode and anode materials that make up batteries, and then pack production (producing the cells before assembling the pack). The roles and skills needed for this stage include compliance managers, process engineers and calibration technicians. Finally, the **downstream** component captures applications, mainly in electromobility but also in stationary storage applications, such as storage of power produced from renewable sources<sup>24</sup>, as well as second life (ie. recycling, which is becoming increasingly important because of regulatory changes and shortages of raw materials<sup>25</sup>). This is the part of the value chain that is expected to see the most demand for workers, for roles including automotive engineers and installation technicians. Some profiles, such as researchers and logistics managers, are required along the entire supply chain (for a detailed discussion, see IEA, 2022).

*Except for some raw material mining, China dominates the global battery value chain<sup>26</sup>. Production is also highly concentrated among a small number of firms. Rather than focusing on comparative advantage and therefore a particular segment of production, the European Battery Alliance defines its mission as “to ensure an unbroken value chain in Europe”<sup>27</sup>. For this to be achieved, workers will be required at each of the stages outlined above.*

In the battery sector, this has led to the development of a global race for talent<sup>29</sup>. Furthermore, it is not only with other countries that the European battery sector must compete for skilled workers, but also with other growing European industries including the solar<sup>30</sup> and semiconductor<sup>31</sup> sectors, which require similar skill profiles and are facing workforce challenges of their own.

While claims of labour scarcity can seem over-hyped, with the reasonable assumption that the jobs will be filled if the pay is high enough, the impacts can be concrete. For instance, a lack of skilled labour was cited by TSMC as the reason for a delay in opening a semiconductor plant in Arizona in August 2023<sup>32</sup>. Attempts to grow and support this sector via industrial policy should therefore take this challenge seriously.

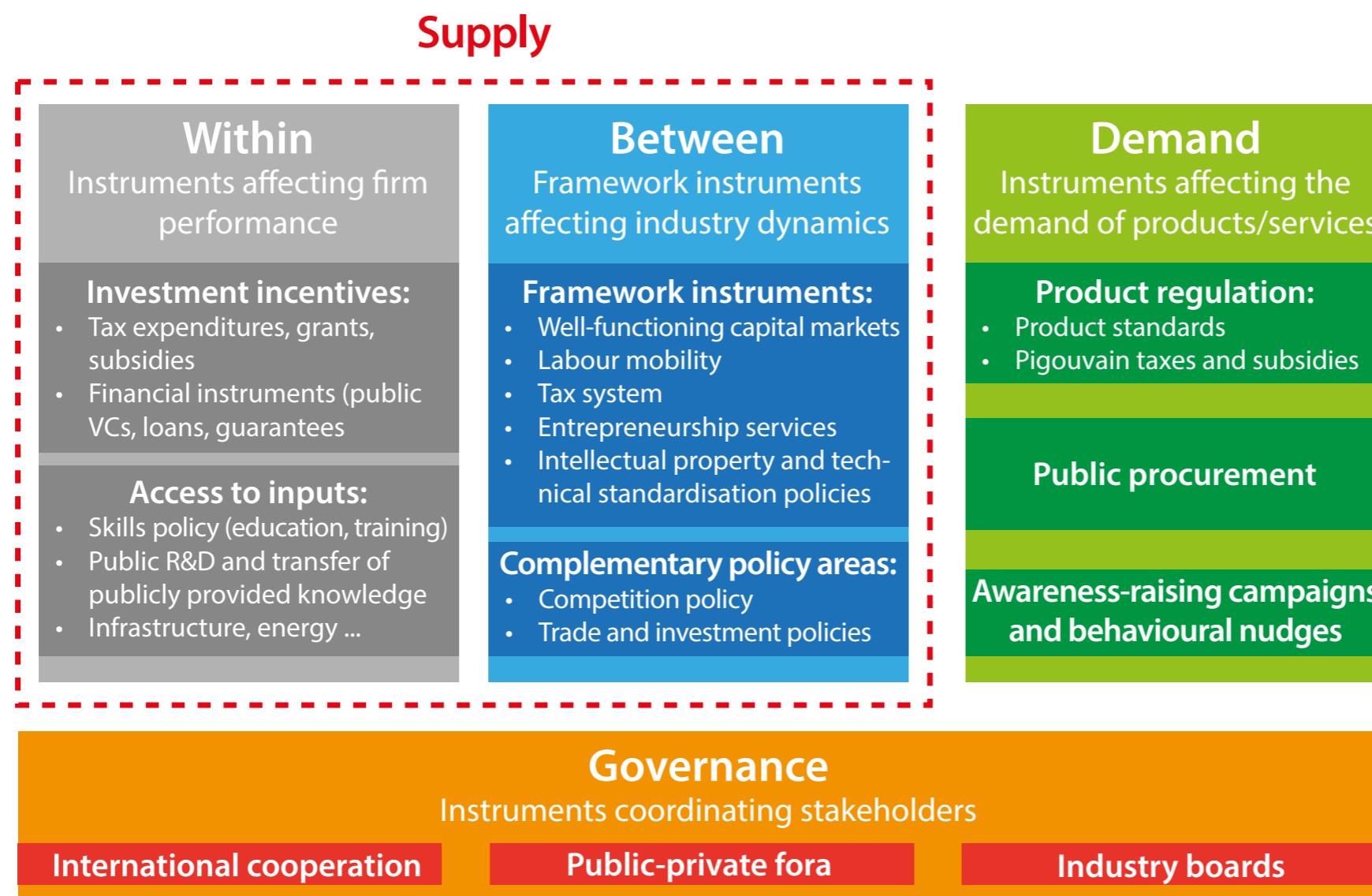
### **3 Policy responses**

Before discussing the instruments put forward by the EU, it is useful to look at a theoretical framework appropriate for their assessment. In their taxonomy of instruments of industrial policy<sup>33</sup>, Criscuolo *et al* (2022a) categorised policies as demand-side, supply-side or governance instruments (Figure 4).

On the supply-side, production-focused instruments, a further distinction is made between ‘within’ instruments, the policies that shape firms’ internal efficiency, and ‘between’ instruments, which instead shape the dynamics between firms.

Labour-market instruments fall into both categories of supply-side instruments: policies that increase general access to skills are considered ‘within’ instruments, while those that affect the allocation and movement of workers between firms are considered ‘between’ instruments.

**Figure 4. Categories of industrial policy instruments**



*Note: The policies listed in each category above are examples, not an exhaustive collection.*

*Source: Criscuolo et al (2022a).*

The new wave of industrial policy has consisted more of the former than the latter, with efforts made to counter skilled-worker shortages across various sectors. Such measures have historically been found to improve growth and productivity, and act as important complements to investment incentives (Criscuolo *et al* 2022b).

For instance, Hanlon (2020) found that the development and maintenance of a pool of skilled workers played an important role in the British shipbuilding industry's maintenance of a dominance advantage over its North American rivals in the decades leading up to the First World War.

These skills-focused instruments have always formed important, if often overlooked, parts of industrial policy. In Singapore in the 1970s, the government established training institutes and business schools and also liberalised immigration to help supply the managers, engineers and technicians needed for the rapid industrial change the country was undergoing (Yeo, 2016).

Towards the end of the same decade, universities in Ireland provided one-year courses and expanded technical programmes to train electrical engineers to match increased demand arising from industrial agreements (Cherif and Hasanov, 2016). A polytechnic institute was created in the 1990s to train workers in Guanajuato, Mexico, as part of a multi-faceted strategy to attract automotive manufacturers (Cherif and Hasanov, 2016).

Labour-market instruments remain important facets of industrial policy. In their quantification of industrial policy measures across nine OECD countries, Criscuolo *et al* (2023) found large variations between countries. For instance, the share of industrial policy grants and tax expenditures in 2021 that went to jobs and skills measures ranged from 35 percent in France to less than 1 percent in Israel.

Policymakers in EU countries have put forward a range of measures to address skilled-labour shortages as part of the post-COVID-19 wave of green industrial policies. In Sweden, one of the European leaders in this sector, the 2020 national strategy to develop a competitive battery industry identified provision of access to a skilled workforce as a key area for partnership between government and industry (Fossil Free Sweden, 2020).

The Swedish national research and innovation institute has provided training programmes for workers along the battery chain<sup>34</sup>, while regional authorities have worked with firms and universities to align training and education with industry needs<sup>35</sup>.

France<sup>36</sup> and Germany<sup>37</sup> have each launched battery training schools to address skills shortages, with France also increasing funding for training in clean-tech sectors<sup>38</sup> and Germany reforming immigration laws to attract more foreign workers<sup>39</sup>.

Beyond the battery sector exclusively, Slovakia, Finland, Denmark, Spain and Malta have all introduced various measures to enhance the skills needed for the green transition (European Commission, 2023d). Fourteen EU countries included in their post-COVID-19 Recovery and Resilience Plans measures targeting green skills and jobs, together amounting to approximately €1.5 billion, or roughly 0.25 percent, of total RRF expenditure<sup>40</sup>.

These efforts have not been limited to the EU. In the US, access to some industrial policy funding has been made conditional on firms implementing labour measures, including apprenticeships for the IRA<sup>41</sup> and childcare in the Science and Chips Act<sup>42</sup>. The Biden Administration has also increased funding for apprenticeships and training programmes to improve the supply of advanced manufacturing workers and to support the policies enacted<sup>43</sup>.

The skills shortage we have documented has prompted a reaction at the EU level. Beyond industrial policy, various measures have been enacted to try to ease the constraint, notwithstanding limited EU powers in this area. The five-year European Skills Agenda launched in 2020 set out 12 actions to improve skill levels across the EU<sup>44</sup>.

For instance, the Pact for Skills, the first flagship action enacted under this Skills Agenda, has mobilised over 1,000 stakeholders (including firms, social partners, national authorities and training institutes) across 14 different industrial ecosystems to cooperate on up- and re-skilling needs (European Commission, 2022)<sup>45</sup>.

Efforts have also been made under the Agenda to improve the recognition of skills and qualifications issued in other EU countries. 2023 was designated the European Year of Skills, with many events and initiatives organised to highlight training and employment opportunities. In November 2023, the European Commission also issued a Skills and Talent Mobility package, which includes proposed measures to ease hiring from non-EU countries and proposes higher targets for inter-EU training mobility<sup>46</sup>.

Regarding financing, the state-aid exemption threshold for skill measures was raised in March 2023 from €2 million to €3 million, increasing the ability of national governments to support training schemes<sup>47</sup>. Various EU budgetary programmes included in the 2021-2027 Multiannual Financial Framework – the EU's budget – including the European Social Fund Plus and Just Transition Mechanism, contain resources earmarked to support green skills (European Commission, 2023f), though precise details on their allocation are difficult to quantify.

While none of these measures is likely to significantly reduce the skills shortage in Europe, they do show that the Commission is at least aware of this challenge and is making efforts to address it. This also holds true in its approach to industrial policy.

The European Chips Act includes measures to support the development of ‘competence centres’, with the intention of boosting access to internships and apprenticeships. Work on a European Chips Skills Academy, supported by €4 million of Horizon+ funding, is in progress to solve skilled-worker shortages in the semiconductor sector<sup>48</sup>.

Addressing the skills shortage in green technologies also formed one of the pillars of both the Green Deal Industrial Plan (European Commission, 2023a) and the proposed NZIA. The Commission has placed the onus of solving these skills constraints on proposed ‘net zero industry academies’ for the respective clean-tech sectors. These are to be modelled on the European Battery Alliance (EBA) Academy (European Commission, 2023e), which we discuss next.

### 3.1 Skills measures in the battery sector

When it was established in late 2017, the European Battery Alliance (EBA) – an industrial alliance bringing together stakeholders across the battery value chain – identified development of a skilled workforce as one of the priority actions facing the industry<sup>49</sup>.

As a result, the need to develop a highly skilled workforce across the value chain was included in the Commission’s 2018 Strategic Action Plan on Batteries (European Commission, 2018), and the need to address this skill shortage has been consistently raised at the annual high-level meeting of the EBA<sup>50</sup>. The EBA Academy was launched in 2022 for this purpose.

Directed by EIT InnoEnergy and supported with €10 million of seed funding from REACT-EU, the EBA Academy is designed to support the training efforts of national and regional authorities to address this skills bottleneck. It has three main purposes: identifying future skill needs; designing and providing training corresponding to these needs; and issuing certifications to accredit the training provided.

Despite claims in the Green Deal Industrial Plan that the EBA Academy “*will train, reskill and upskill approximately 800,000 workers by 2025*” (European Commission, 2023e, p.16), the target in the proposed NZIA is for the academy to upskill 100,000 workers by 2025, with the hope that other workers will benefit indirectly (eg. from ‘train-the-trainers’ initiatives).

Complementing previous work by the Alliance for Batteries Technology, Training and Skills (ALBATTs, an EU-funded four-year project launched in 2019)<sup>51</sup>, the first pillar of the EBA Academy is to identify the job roles that both are and will be in demand across the value chain.

A range of methods is used for this purpose, including analysing online job postings and engaging with stakeholders and experts. To date, over 600 unique roles and profiles have been identified (EIT InnoEnergy, 2023). The various skills, and the level of expertise in those skills, that each role requires are established and documented in a report known as a ‘skills compass’.

For instance, a quality technician would be required to be an expert in ‘quality assurance processes’, while also having a much more limited awareness of ‘environmental health and safety’ (EIT InnoEnergy, 2023).

Once these required skills have been identified, the Academy then produces training material to correspond to these needs. These training packages span both the educational qualification spectrum (ie. from Masters’ programmes to short-term vocational training material)<sup>52</sup> and the value chain. The Academy then works with firms and local training providers (eg. community training centres, universities or national battery schools, as in France) in EU countries to deliver the training to workers<sup>53</sup>.

There is a wide variety in the courses offered: some are hands-on and intended to be delivered on-site by experts, with others designed to be accessed online and completed asynchronously.

Finally, the EBA Academy issues certifications to graduates detailing the training that has been received, so that it can be recognised by firms across the European battery sector. At the time of writing, exam-based and Europass-compatible<sup>54</sup> certification was available for three courses<sup>55</sup>, with work ongoing to expand this to six other courses.

As of December 2023, approximately 50,000 workers and 90 ‘trainers’ (out of targets of 100,000 and 100 by 2025 respectively) had received training through the Academy<sup>56</sup>. The average age of participants was 34, with men making up 50.5 percent of learners. Memoranda of Understanding had been signed with 11 governments to avail of this support, with courses provided in 10 languages.

Associated language costs have proved to be a significant burden for the Academy, given the frequent modification and updating of the courses on offer.

#### **4 Policy lessons**

Access to skills is a bottleneck in developing a European EV supply chain. Given the rapid expansion of a sector directly linked to the decarbonisation of transport, coupled with the current overreliance on China for supply, public intervention to facilitate this shift is justified.

However, the role of EU-level policy to provide a public good in this regard is not straightforward. Education and labour markets are national responsibilities, and local and state governments are often better equipped than the EU to provide training programmes that fit the specific requirements of local labour markets. The EBA Academy provides some returns to scale by developing training programmes that will be useful in many locations.

However, it also exemplifies the current lack of EU investment in skills. Compared with the €6.1 billion in subsidies in the two battery Important Projects of Common European Interest<sup>57</sup> and hundred million euro state-aid packages that can be expected as part of the Temporary Crisis Transition Framework (TCTF<sup>58</sup>), the €10 million in seed funding over three years to support the labour needs looks rather meek.

Nevertheless, there is a political case for the EU to act to provide support for reskilling the workforce. The decarbonisation plans that necessitate phasing out ICE vehicles were developed and implemented at the EU level. The EU will thus likely be seen as at least partly responsible for job losses that occur during the transition.

At the same time, the EU is greenlighting billions in subsidies for capital investment in the sector. Without a plan to also support labour, such a policy would rightly be perceived as lopsided. Given the importance that both large companies and SMEs give to the skills shortage, a more involved EU skills strategy would also signal that these concerns are taken seriously at the highest political level.

This is especially important considering that 70 percent of SMEs think that the EU is not doing much to help companies like theirs tackle skill shortages (Eurobarometer, 2023b).

Making subsidies conditional on labour-market measures, as done in the US under the IRA and the Chips and Science Act, might not be the first option for the EU. Given the limited labour market effect that is expected from the IRA (section 2.1), this represents mostly a symbolic act that will benefit only a small number of workers (Poitiers, 2023).

In the EU, where labour-market instruments with general coverage are available and protection of labour rights is more stringent in general, there would be less justification for such measures.

Furthermore, the constitution of labour markets is a national competence and linking EU industrial policy to changes in the governance of labour relations in EU countries would require support from the member states.

Beyond skill shortages directly, two challenges should be considered when designing EU labour policies that support the battery industry. The first corresponds to demographics. Because of demographic change, the EU working-age population decreased by 2.6 percent between 2009 and 2022, and is expected to fall by about the same amount between 2022 and 2030, and by 6.8 percent in total between 2022 and 2040 (European Commission, 2023c).

Simultaneously, the green transition is expected to lead to a shift in demand for labour. As discussed above, certain job profiles will be more in demand, while demand for others will decrease. Older workers with skills profiles linked to a decrease in employment opportunities might not find it worthwhile investing in new skills without public support.

The economic incentives to invest into reskilling are much lower for older workers and their employers, which have a shorter prospective return on such investments than for younger workers, meaning that there may be a particular role for policy in addressing this issue.

Given these demographic challenges, the EU should also target for roles in the battery sector young people who are not in education, employment or training (11.7 percent of young people in 2022; European Commission, 2023c) and women (who in Germany make up just 24 percent of the battery-production sector; Arnold-Triangeli *et al* 2023).

While the measures announced under the Skills and Talent Mobility Package in November 2023 may help to facilitate the hiring of workers from outside the EU, the global race for talent in this sector means that the EU should not rely on immigration to ease this skills shortage.

The second challenge concerns the location of jobs. Given the limited geographical mobility of workers, and the potential mismatch between the regions dependent on the automotive industry for jobs and the location of new battery production plants, localised negative labour market shocks will pose a challenge and have the potential to undermine political support for the green transition (see Cameron *et al* 2020, for a breakdown of regions particularly at risk).

A successful industrial policy should help reskill older workers and mitigate the negative effects of the green transition on local communities, while making it easier for workers to move for new employment or training opportunities.

The EU has taken some initial steps into this direction. The TCTF links the eligibility of clean-tech manufacturing projects for subsidies to those projects benefitting poor regions in the EU (Tagliapietra *et al* 2023).

While such a link is not explicit in the IPCEIs, countries including France and Germany have used industrial subsidies to incentivise the location of battery factories in poorer regions such as Eastern Germany<sup>59</sup> or Northern France<sup>60</sup>.

Given the dual constraint of limited EU competence in both industrial policy and skills, the EBA Academy is a useful EU instrument to complement national policies. Its ability to address the identified skills shortage seems limited at best, but it is a relative cost-effective instrument that does appear to provide a useful resource to training providers across the EU.

However, there are a few areas for improvement. Based on the average learner age reported previously, the EBA Academy seems to mainly reach younger workers, and is not well equipped to target specific labour markets and demographics that might be underserved by private training providers.

While the burden of this may rest more on local or national authorities, more focus should be placed on targeting older or financially constrained workers, who otherwise may not be able or willing to take up the courses offered.

The EBA also needs a stronger profile and should engage more with SMEs, which will become more important players in the battery sector (eg. once EV repairs and maintenance become more widespread) and of which 65 percent are unaware of EU skills policies (Eurobarometer 2023b). Work should continue on expanding the credentials provided, as this is recognition of training is crucial for both firms and learners.

Finally, there is a risk that the different clean-tech skills programmes will directly compete against each other, and a strategy should be devised to identify synergies and avoid such competition. This should be feasible now that the solar, hydrogen and battery skills institutes are all under the same umbrella of the InnoEnergy Skills Institute.

More generally, the social and labour aspects of EU industrial policy should be rethought and given more prominence. The EBA and the Just Transition Fund provide early steps in this regard, but the current lack of competences at the EU limits what can be done. This is regrettable, as it limits the EU's ability to form a well-balanced industrial policy.

## **5 Conclusions**

Despite the significance of skilled-labour shortages as a bottleneck in the development of a European battery supply chain, an ambitious policy response at EU level is lacking. The EBA Academy, which provides training solutions, is the headline EU skills initiative to tackle this bottleneck. While it receives relatively little funding, the EBA Academy is a potentially valuable and low-cost tool. However, it could be improved by more explicitly targeting those workers who might not receive training without public support.

Given the importance that companies, and especially SMEs, put on the shortage of available skilled workers, current policy responses are not satisfactory. While we argue that labour markets should be mostly considered as an input and not an output in industrial policy, there are political benefits in linking EU green policy with skill policies. Therefore, we argue for EU member states to allow the EU to get more involved in skill policies. ■

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## Endnotes

1. The academy was rebranded in early 2023 to become the storage component of the wider InnoEnergy Skills Institute. For clarity and ease, we refer to it as the EBA Academy in this paper.
2. Defined by Juhász et al (2023, p.4) as “government policies that explicitly target the transformation of the structure of economic activity in pursuit of some public goal”.
3. As defined in Article 6 of the TFEU, the EU only has competence “to carry out actions to support, coordinate or supplement the actions of the member states” in the area of industry.
4. While an ‘EU industrial strategy’ had been on the Council of the EU agenda since at least 2017, this refers more generally to improving the performance of European firms and strengthening the single market, not to establishing domestic manufacturing bases in certain sectors. [A timeline of the Council’s position on industrial policy](#).
5. See The White House, ‘[Fact sheet: President Biden Takes Historic Step to Advance Worker Empowerment, Rights, and High Labor Standards Globally](#)’, 16 November 2023.
6. Source: ACEA ‘[Employment trends in the EU automotive sector](#)’, 22 September 2023.
7. The academy was rebranded in early 2023 to become the storage component of the wider InnoEnergy Skills Institute. For clarity and ease, we refer to it as the EBA Academy in this paper.
8. See for instance The White House, ‘[Remarks by President Biden on the Inflation Reduction Act and Bidenomics](#)’, 15 August 2023.
9. [As detailed in his September 2023 remarks](#) at the Bruegel Annual Meetings.
10. Niclas Poitiers, ‘[The manufacturing jobs boom that isn’t](#)’, First glance, Bruegel, 29 August 2023.
11. The European Association of Automotive Suppliers estimated that 275,000 jobs will be lost on aggregate across the EU, EFTA and the UK between 2020 and 2040 (CLEPA, 2021); Boston Consulting Group (Kuhlmann et al 2021) put net European losses at 50,000 by 2030.
12. Diluiso et al (2021) detailed that 130 of the coal transitions between 1860 and 2020 included in their literature analysis were associated with negative labour market outcomes (higher unemployment and job losses). Only five were linked with positive outcomes.

13. See '[2023 State of the Union Address by President von der Leyen](#)', 13 September 2023.
14. Henry Foy and Martin Arnold, '[Mario Draghi delivers downbeat outlook for EU economic growth](#)', *Financial Times*, 8 November 2023.
15. *The next highest responses were secondary education for large firms (22 percent), and no level in specific for SMEs (20 percent), meaning that the share of both large and small companies that answered vocational level was almost double that of the next answer.*
16. Nick Alipour, '[Germany's skilled labour shortage puts vital industries at risk](#)', *Euractiv*, 30 November 2023 (updated: 1 December 2023).
17. Reuters, '[Half of German companies face labour shortages despite economic stagnation - survey](#)', 29 November 2023.
18. *This action plan was heavily informed by the European Battery Alliance, which identified building a skilled labour force as one of the key actions required to develop a European battery sector.*
19. Richard Milne, '[Northvolt: the Swedish start-up charging Europe's battery ambitions](#)', *Financial Times*, 14 March 2023. For more stakeholders pointing to the skills shortage as a significant issue for the European battery sector, see EIT InnoEnergy, '[TÜV SÜD and EIT InnoEnergy launch partnership to combat skills shortage in battery sector](#)', 21 October 2022.
20. 'No particular education level' at 20 percent.
21. See for instance the 2023 Green Deal Industrial Plan (European Commission, 2023e)
22. *The estimates appear to be based on a report by the Fraunhofer Institute (2021) and seem to outweigh the estimates detailed previously.*
23. *Each stage in the value chain requires a huge range of jobs, with those listed here merely a sample. For a more complete list of roles along the value chain, see EIT InnoEnergy (2023).*
24. For a more comprehensive discussion of stationary storage applications see <https://www.ise.fraunhofer.de/en/key-topics/stationary-battery-storage.html>.
25. For a more detailed discussion on the growth of battery recycling see McKinsey, '[Battery recycling takes the driver's seat](#)', 13 March 2023.

26. The IEA does not report data for the geographical location of the second-life industry.
27. See [European Battery Alliance](#).
28. Bacary Dabo, ['Africa: The DRC Faces a Skills Shortage in its Quest to Manufacture Electric Vehicle Batteries in the Congo'](#), allAfrica, 25 November 2021; Benchmark Source, ['What does Australia's labour shortage mean for lithium expansions?'](#) 21 June 2021; Byun Hye-jin, ['Why Korean battery makers' mass hiring still 'not enough' for tech race.'](#) The Korea Herald, 19 September 2023; Steve LeVine, ['The Electric: The Next Hurdle for a U.S. Battery Industry: Talent'](#), The Information, 25 September 2022; Ryohtaroh Satoh, ['Japan to teach teenagers to make EV batteries amid labor shortage'](#), Nikkei Asia, 29 June 2023.
29. See [European Battery Alliance webinar of 12 April 2022](#) for a stakeholder discussion on the international race for talent.
30. Benoit Ribeaud, ['Workforce dilemma casts long shadow'](#), PV Magazine, 23 November 2023.
31. Pieter Haeck, ['Chip manufacturers scramble to staff their European factories'](#), Politico, 18 September 2023.
32. Michael Sainato, ['"They would not listen to us": inside Arizona's troubled chip plant'](#), The Guardian, 28 August 2023.
33. Which Criscuolo et al (2022a, p.14) broadly defined as interventions used "to structurally improve the performance of the domestic business sector".
34. RISE, ['Battery training and courses in batteries'](#), undated.
35. See <https://skelleftea.se/platsen/eng/business/stories-eng/2021-11-22-skellefteas-success-a-national-affair> and Stolfa (2023) for details on the work done by the Skelleftea municipality to attract Northvolt.
36. See Verkor press release of 30 August 2022, ['Verkor and 11 partners launch the École de la Batterie'](#).
37. Evertiq, ['Germany is looking to combat the shortage of workers'](#), 10 October 2022.
38. See Loi n° 2023-973 du 23 octobre 2023 relative à l'industrie verte, <https://www.legifrance.gouv.fr/dossierlegislatif/JORFDOLE000047551965/>.
39. Nick Alipour, ['Germany's skilled labour shortage puts vital industries at risk'](#), Euractiv, 30 November 2023.

40. Figures as of August 2023, so may not reflect final allocations. Countries included are Greece, Spain, France, Croatia, Portugal, Slovenia, Ireland, Estonia, Lithuania, Romania, the Netherlands, Cyprus, Finland and Denmark; see European Commission (2023f).
41. Apprenticeship USA, '[Inflation Reduction Act Apprenticeship Resources](#)'.
42. See The White House, '[ICYMI: Experts Agree: Chips Manufacturing and National Security Bolstered by Childcare](#)'.
43. For more details, see The White House, '[Factsheet: To Launch Investing in America Tour, the Biden-Harris Administration Kicks off Sprint to Catalyze Workforce Development Efforts for Advanced Manufacturing Jobs and Careers](#)', 6 October 2023.
44. See European Commission news of 1 July 2020, '[Commission presents European Skills Agenda for sustainable competitiveness, social fairness and resilience](#)'.
45. The European Commission (2022) estimated that, as a result of the Pact, by the end of 2022 almost 2 million individuals were "reached by upskilling and/or reskilling efforts", over 15,000 training programmes were updated or developed, and almost €160 million was invested in upskilling and reskilling. However, without a counterfactual it is difficult to determine the actual impact of this initiative.
46. See European Commission press release of 15 November 2023, '[Commission proposes new measures on skills and talent to help address critical labour shortages](#)'.
47. See European Commission press release of 9 March 2023, '[State aid: Commission amends General Block Exemption rules to further facilitate and speed up green and digital transition](#)'.
48. A European Chips Skills Academy to solve skilled-worker shortages in the semiconductor sector is also in progress and is supported by the Erasmus+ programme; see Nick Flaherty, '[Semi launches €4m European Chip Skills Academy](#)', EE News Europe, 14 April 2023.
49. See [European Battery Alliance](#).
50. For the 2023 takeaways, see '[7<sup>th</sup> High-Level Meeting of the European Battery Alliance, main takeaways by the Chair Maroš Šefčovič and the Council Presidency](#)', undated.

51. For an in-depth account of all the EU policy measures, introduced to support the battery sector, including those centred around skills, see ECA (2023).
52. Based on our conversations, the greatest demand is for short-term training.
53. The Academy is designed to be self-sustaining, and as such does not provide its content for free. It enters into commercial arrangements with LTPs, who can then charge learners for the training provided. In some instances, this training can be subsidised by local authorities or other relevant organisations.
54. The Europass profile is an online portal that allows workers to document their education, training and experiences. See <https://europa.eu/europass/en/stakeholders/education-and-training>.
55. Fundamentals on Batteries, Battery Storage Basics and Battery Management Systems.
56. Data from an internal EIT InnoEnergy report shared with Bruegel.
57. IPCEIs are state aid exemptions granted by the Commission in order to support major cross-border innovation and infrastructure projects, including the industrial deployment of innovative technologies. They have been used to support large battery, hydrogen and chip projects (for an overview, see Poitiers and Weil, 2022b). For the battery sector, see the Commission's [overview on approved IPCEIs](#).
58. The temporary loosening of state aid rules to support clean-tech industries, announced in March 2023; see European Commission, '[Temporary Crisis and Transition Framework](#)'.
59. Guy Chazan and Joe Miller, '[The surprising revival of eastern Germany](#)', Financial Times, 28 June 2022.
60. Reuters, '[France inaugurates first of four gigafactories in the north](#)', 30 May 2023.

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# Carbon leakage: an additional argument for international cooperation

Climate change is a collective action problem that requires substantial international cooperation. Christofer Schroeder and Livio Stracca present new evidence that carbon taxes are undermined by 'leakage'

**C**arbon dioxide ( $\text{CO}_2$ ) emissions are a key driver of climate change and a major threat to lives and livelihoods. As the environment is a global good, emissions reductions benefit the planet as a whole, regardless of where the reductions occur. Governments, therefore, have an incentive to free-ride on the environmental policies of others, foregoing the costs while reaping the benefits in terms of mitigating climate change.

Although this collective dimension is well recognised (eg. Snower 2022), governments around the world have largely introduced unilateral policies aimed at reducing emissions or slowing their growth.

Among the menu of unilateral policy options available, carbon taxes are generally regarded as particularly efficient (Metcalf 2019, Nordhaus 1977) and potentially less regressive (Levinson 2018). Indeed, carbon taxes have been found to exert a significant negative impact on domestic emissions (Andersson 2019, Bustamante and Zucchi 2023, Metcalf 2019), though evidence of their macroeconomic impact is less clear (Käenzig and Konradt 2023, Metcalf and Stock 2020).

### **Carbon leakage**

A common concern with carbon taxes is the potential for ‘carbon leakage’ – shifts in the production of emissions away from regions in which they are taxed. This undermines the effectiveness of such policies, even abstracting from the fact that their introduction suffers from a free-rider problem. Indeed, initiatives such as the EU’s Carbon Border Adjustment Mechanism (CBAM), which will come into force in 2026, aim precisely at preventing this problem.

While carbon leakage is an established theoretical channel (see Copeland *et al* 2022 for a detailed discussion), the empirical evidence is mixed. Böning *et al* (2023) find that the EU’s Emissions Trading System (ETS) has led to carbon leakage, while Aichele and Felbermayr (2015) provide evidence of carbon leakage from the Kyoto Protocol.

Indeed, aggregate data show that emissions in many advanced economies have been declining since the early 2000s while rising in many developing economies (Plumer 2017). The extent to which these patterns are explained by carbon leakage, however, remains unclear.

In this column, we summarise new empirical evidence of carbon leakage, drawing on our recent research estimating the impact of carbon taxes on emissions, using annual country data from the Global Carbon Project

*Nationally determined policies will have a meaningful impact on reducing global emissions only if they are accompanied by mechanisms that eliminate carbon leakage*

(Schroeder and Stracca 2023). Our findings suggest that carbon taxes do indeed lead to carbon leakage, particularly for countries that are more open to trade.

Importantly, our study distinguishes between two different measures of emissions at the national level: territorial emissions (or the emissions emitted within a country's borders) and consumption emissions (or the emissions emitted anywhere in the world to satisfy a country's domestic demand)<sup>1</sup>.

The difference between the two measures of emissions are net imported emissions. Within this framework, carbon leakage can be observed when a carbon tax leads to a reduction in territorial emissions that is offset by an increase in net imported emissions. Together, these leave consumption emissions less impacted or unchanged.

Our estimates show that carbon taxation has a negative, cumulative impact on territorial emissions over time, which is good, but no impact on consumption emissions, which may imply that their overall effect is limited if implemented in isolation (note that in our paper we do not directly measure the effects of taxes on emissions in other countries).

The results plotted in panel A show that carbon taxes significantly reduce territorial emissions starting around three years after implementation. Consumption emissions, on the other hand, are estimated to fall by less than territorial emissions; these estimates are not statistically significant, as shown in panel B. Together, these results offer evidence of carbon leakage from carbon taxes.

### **The role of international trade**

Carbon leakage across international borders implies that trade acts as a conduit for emissions. That is, countries more open to trade may be more susceptible to carbon leakage than countries less open to trade. Indeed, we find evidence of this outcome.

The results in Figure 2 show that the patterns in Figure 1 are driven by countries that are more open to trade. In particular, carbon taxes significantly reduce territorial emissions over time, regardless of a country's openness to trade, as shown in panel A. The impacts on consumption emissions differ, however, as shown in panel B.

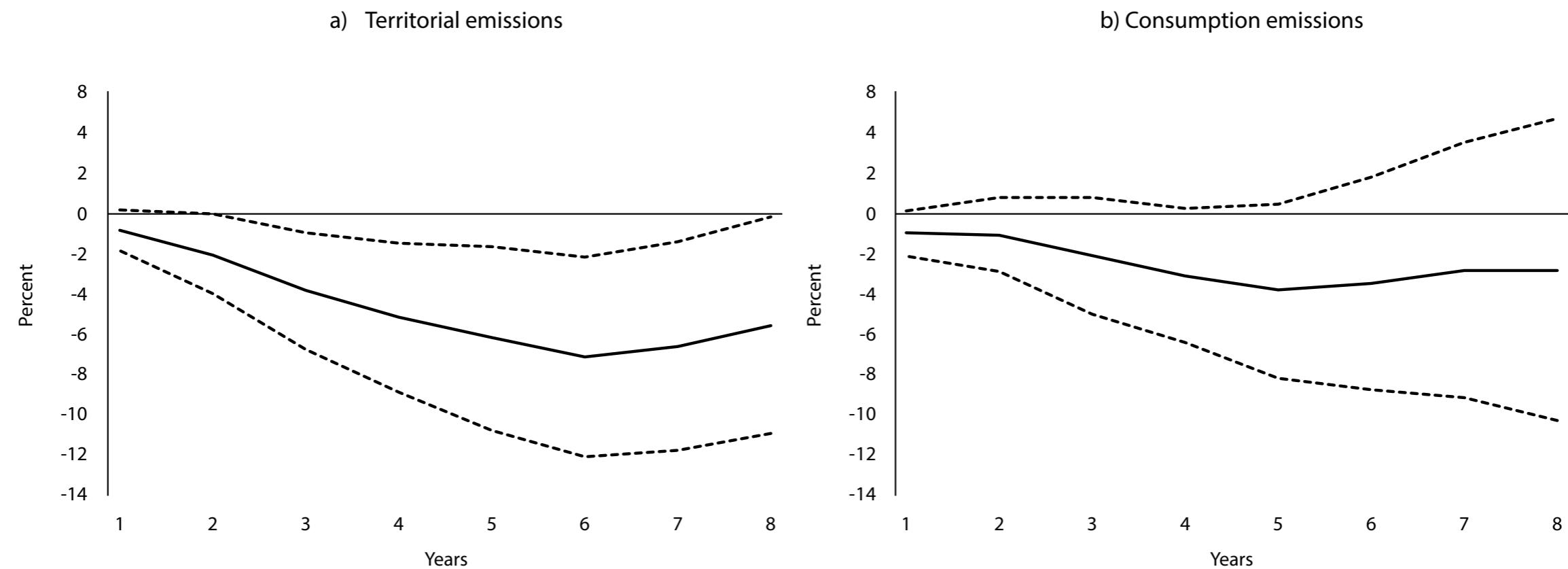
Countries that are more open to trade see no significant impact of carbon taxation on consumption emissions, while countries that are less open to trade see a significant reduction. These results suggest that openness to trade is a key country characteristic enabling carbon leakage.

Our findings have important implications for the design of policies aimed at mitigating emissions, which are not limited to carbon taxes but can also involve green subsidies and other instruments. Nationally determined policies will have a meaningful impact on reducing global emissions only if they are accompanied by mechanisms that eliminate carbon leakage.

'Climate clubs' or CBAMs, for instance, can help reduce the incentive to offshore the production of emissions, despite their administrative challenges (Dominioni and Esty 2022). Our findings are in line with a broad literature emphasising the importance of international cooperation and coordination in implementing the policies needed for reducing emissions to meet the goals set out in the Paris Agreement (Ferrari *et al* 2023). ■

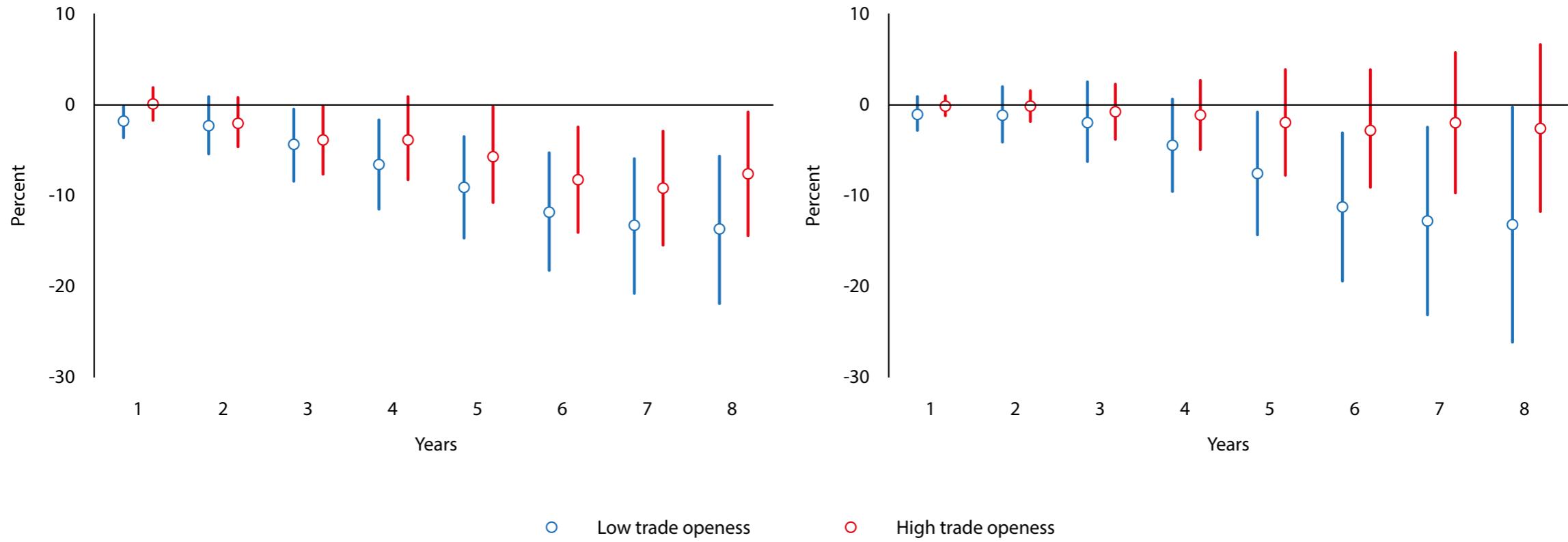
**Christofer Schroeder is an Economist Graduate Programme Participant in the Directorate General Economics, Livio Stracca is the Deputy Director General Financial Stability, both at the European Central Bank**

## Figure 1. Dynamic effects of carbon taxation on emissions



Notes: This figure plots impulse response functions capturing the dynamic cumulative effects of carbon tax implementation on territorial (panel a) and consumption (panel b) emissions based on local projections of annual data. The dashed lines represent 90% confidence intervals surrounding the point estimates of the dynamic impacts plotted by the solid lines.

**Figure 2. Dynamic effects of carbon taxation on emissions by openness to trade**



*Notes: This figure plots impulse response functions capturing the dynamic cumulative effects of carbon tax implementation on territorial (panel a) and consumption (panel b) emissions by countries' level of trade openness. The blue circles plot point estimates of the effect for countries with low openness to trade. The red squares plot point estimates of the effect for countries with high openness to trade. High openness to trade countries are defined as those with above median openness to trade in a particular year. Both series of estimates are surrounded by 90% confidence intervals represented by the solid lines of the same colour.*

## Endnote

1. We draw on data on territorial and consumption emissions from the Global Carbon Project (GCP). See <https://www.globalcarbonproject.org> and Andrew and Peters (2021) for detailed accounts of the data. In practice, the GCP estimates consumption emissions by adjusting territorial emissions with estimates of net emissions transfers via international trade. Net emissions transfers are estimated via environmentally extended input-output analysis (EEIOA).

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# Europe's under-the-radar industrial policy

Ben McWilliams, Giovanni Sgaravatti, Simone Tagliapietra and Georg Zachmann outline the trade-offs European governments must confront to meet the challenge of decarbonising their countries' economies



## Executive summary

The different ways in which European Union member state governments add levies to the price of electricity creates huge discrepancies in the prices paid by consumers. Europe's energy transition depends upon increasing electrification of the economy and increasing the share of that electricity produced by renewable sources. Both factors raise the importance of electricity taxes set by governments.

The energy crisis drew attention to this: as electricity prices soared, governments responded with billions of euros in subsidies to protect households and companies.

While the acute phase of the energy crisis has passed, growing concerns about industrial competitiveness create political pressure for governments to continue with such subsidies or tax exemptions. High profile examples include the French reform of nuclear-power generated electricity pricing, and a political debate in Germany over how aggressively to subsidise the electricity price paid by energy-intensive firms.

We frame the debate on intervention in electricity pricing around five distributional dilemmas concerning the recuperation of electricity expenses: 1) whether to raise general or electricity taxes, 2) the split between household and companies, 3) the split between energy-intensive and non-energy intensive companies, 4) crossborder effects, and 5) trade-offs in attracting new clean-technology manufacturing factories.

Priorities according to these distributional criteria will differ by country, but these factors should be central to discussions. Governments must recognise that efforts to lower prices artificially for one group of consumers will raise prices for others, including with crossborder implications. The current compromises in the French and German cases do not pose substantial issues to the integrity of the European single market and do not penalise non-energy-intensive domestic consumers excessively.

## 1 Introduction

The European Union successfully navigated the 2022 energy crisis, and it is now more energy secure and more resilient against energy shocks (McWilliams *et al* 2023). However, gas and electricity prices in the EU have remained persistently above their pre-crisis levels. The prospect of a persistent energy-price disadvantage compared to major competitors might be more challenging for the EU's industrial competitiveness than the energy crisis itself<sup>1</sup>.

European policymakers are now confronted with the double challenge of decarbonising their countries' economies, implying increased electricity consumption, while maintaining industrial competitiveness. This challenge brings electricity policy to the forefront of industrial policy.

Varying taxes and tariffs mean different consumers in the same market pay vastly different electricity prices. In the coming decade, European energy consumption will shift increasingly to electricity and decisions made by government over these levies will become ever more significant, with economic, political and societal consequences.

In this Policy Brief we discuss the main trade-offs facing governments in this respect. We outline the impacts of the energy crisis, during which high and volatile electricity prices stimulated billions of euros in government subsidies.

We then discuss the growing electrification of European economies and the growing role for government in distributing the costs of this transition across society. We discuss the specific cases of electricity pricing debates in France and Germany. We conclude by outlining the five essential distributional trade-offs governments must confront when setting electricity taxes:

1. Recovering costs through electricity tariffs or general taxation,
2. The split of taxes between households and industry,
3. The split of taxes between energy-intensive and the remaining industry,
4. Crossborder impacts of subsidies; and,
5. Trade-offs to consider when attracting clean technology manufacturing.

*In Germany, the extent to which government should use electricity policy to support energy-intensive firms has been debated extensively*

## 2 The lasting impact of the crisis

The effect of the energy crisis on electricity prices has been dramatic, with wholesale prices peaking in August 2022 above ten times the 2019-2020 average price and differences between EU countries widening. The electricity mixes in different countries are fundamental in setting the price of electricity. Government support schemes for certain technologies to a great extent define each country's electricity mix.

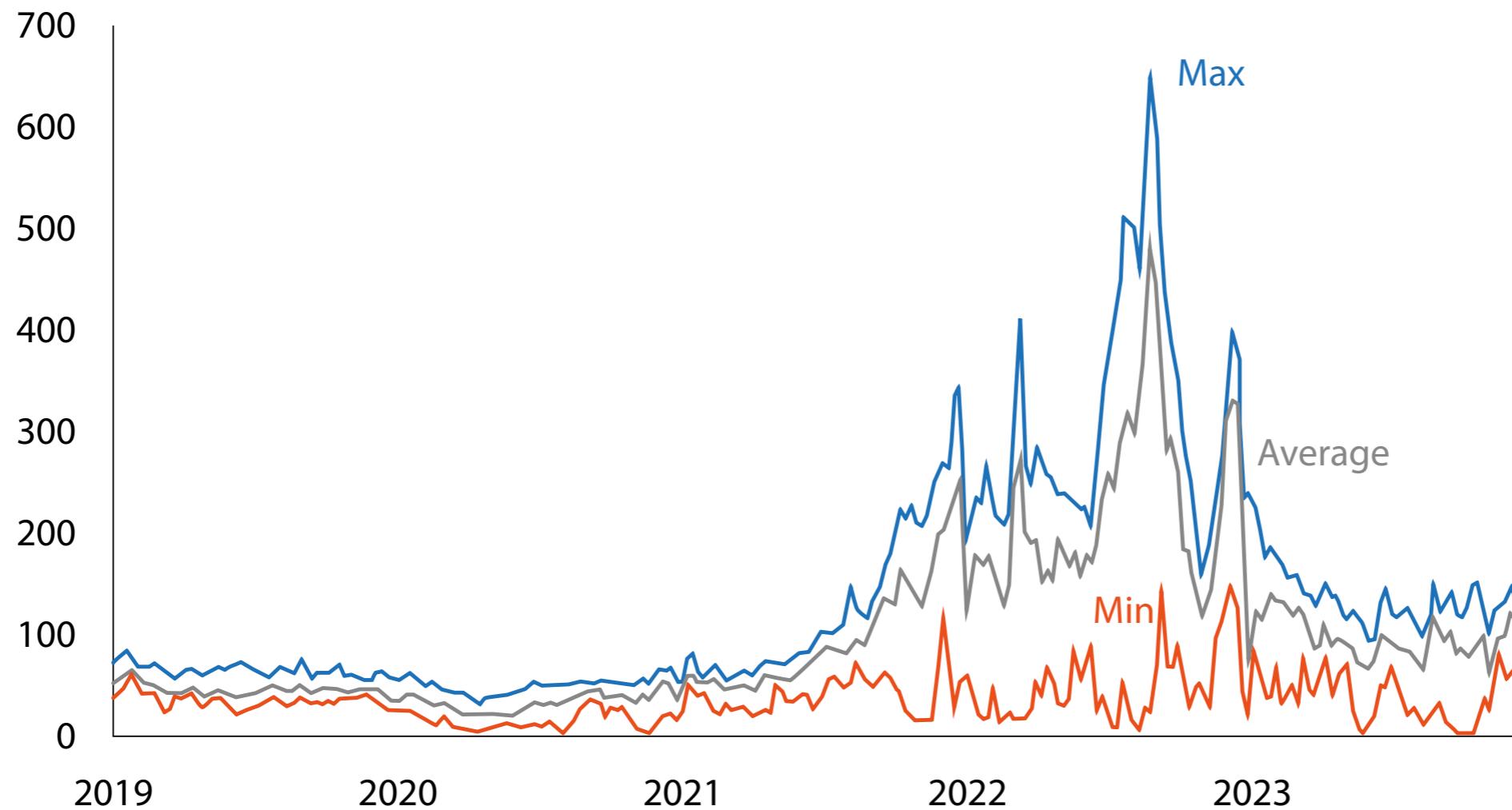
Figure 1 illustrates this. It shows the weekly average minimum and maximum electricity prices in the EU, excluding islands. In the past three years, Sweden and Italy have consistently set the minimum and maximum prices in the EU. This reflects past policy choices, with Sweden betting on nuclear and renewables, while Italy relies to a much greater extent on natural gas.

Figure 1 also shows that while wholesale electricity prices decreased in the second half of 2023, the price differential remains larger than before the energy crisis, with a higher upper limit. In the first half of 2023, EU wholesale prices fluctuate on average around €100/MWh, compared to a range of \$30-\$50/MWh across key United States markets, approximately \$75/ MWh in Japan and \$60/MWh in India.

Intervention in electricity prices is part of the industrial policy toolkit of governments. France has the Regulated Access to Historic Nuclear Energy (ARENH) system (see section 5), designed to "*give French customers the comparative advantage of the low production costs of the historical nuclear plant pool*" (Cours des Comptes, 2022).

In Germany, certain industrial consumers benefit from a dozen exemptions, including exemption from the renewables surcharge (EEG, from Erneuerbare-Energien-Gesetz – Renewable Energy Sources Act) to keep their electricity prices lower<sup>2</sup>.

**Figure 1. European min, max and average wholesale weekly electricity prices, €/MWh**



Source: Bruegel based on Energy Charts.

However, since the COVID-19 pandemic, government intervention in the economy has dramatically increased. After Russia's invasion of Ukraine, support was channelled towards mitigating the energy-price shock.

Total energy subsidies in the EU rose from €177 billion in 2015 to €216 billion in 2021 and spiked at an estimated €390 billion in 2022 (European Commission, 2023a). Natural gas and electricity subsidies increased the most in 2023, tripling from €15 billion and €20 billion to €46 billion and €64 billion, respectively.

Exceptional energy support measures allowed under the EU's March 2022 Temporary Crisis and Transition Framework for State Aid (sections 2.4 and 2.7)<sup>3</sup> were due to expire at the end of 2023, before EU governments successfully lobbied for a six-month extension until June 2024<sup>4</sup>.

Subsidies to support business affected by the energy shock have been generally approved under the EU state aid crisis frameworks, approval granted to more than €672 billion in aid since March 2022<sup>5</sup>. Much of the approved support extends beyond 2023. The largest shares were for Germany (53 percent of the total, or €356 billion), and France (24 percent, equivalent to €161 billion).

Temporary loosening of EU state aid rules has made such largess possible, but in 2024 the EU fiscal rules – the Stability and Growth Pact, which governs how much debt governments can build up – will be replaced by a new framework (see Darvas *et al* 2023), requiring fiscal adjustment for all countries with debt above 60 percent of GDP and/or deficits above 3 percent (this includes Germany).

With energy prices remaining stubbornly above their pre-crisis levels, and an international trend of more active industrial policy (for example, the Inflation Reduction Act in the US), Germany and France wish to extend substantial subsidies for domestic industry<sup>6</sup>.

German government interventions to reduce electricity levies and fees for energy-intensive companies were the largest among the five major EU countries (Table 1). Retail prices for energy-intensive companies in Spain have increased less than in any other major EU country, driven by government intervention in the pricing mechanism and increasing shares of renewables.

The energy-supply component of retail prices paid by energy-intensive industry increased most dramatically in Italy, where natural gas sets the price of electricity in 90 percent of hours – more than in any other EU country (Gasparella *et al* 2023). Poland is the only country where the tax component of electricity prices for energy-intensive companies went up over the period.

### **3 Electrified Europe**

Electricity is the future of the European energy system. Consumers are already swapping gas boilers for heat pumps and petrol cars for electric vehicles. Consequently, the share of final energy demand met by electricity is set to grow.

In 2021, electricity provided 23 percent of the EU's final energy demand<sup>7</sup>. This share is projected to grow to 30 percent in 2030, and 50 percent in 2050, in scenarios that see the EU achieve its emission reduction targets (European Commission, 2020b).

Rapid installation of solar panels and wind turbines means renewable energy sources will meet an increasing share of this electricity generation. In 2019, wind was 13 percent of EU electricity generation, increasing to 15 percent by 2022. Over the same period, solar has increased from 4 percent to 7 percent<sup>8</sup>.

EU leaders have set a target for renewables to meet 42.5 percent of final energy demand by 2030. This implies that renewables will meet 65 percent to 70 percent of electricity demand (also including generation from hydro and biofuels) (European Commission, 2022).

**Table 1. Electricity price changes for energy-intensive industry from 2021 to 2023 (eurocents/kWh)**

	Price including taxes (excl. VAT), H1 2021	Change in energy supply component	Change in tax component (excl. VAT)	Price including taxes (excl. VAT), H1 2023
France	6.55	6.67	-0.39	12.83
Germany	10.99	0.91	-3.63	17.27
Italy	9.12	11.3	-0.37	20.05
Spain	6.96	3.22	-0.41	9.77
Poland	8.5	8.6	4.07	21.17
EU average	8.33	8.57	-0.99	15.91

Note: Prices refer to the retail electricity price paid by energy-intensive industry and are an unweighted average of the three highest consumption bands reported by Eurostat (above 20 GWh/year). We take prices from the first half of each year.

Source: Bruegel based on Eurostat.

A major consequence is that the number of hours in which renewables can meet total electricity demand will increase. Consequently, renewables will be responsible for setting market prices more frequently (prices in European electricity markets are set by the source which provides the last unit of supply required to meet demand<sup>9</sup>).

For a better sense for the magnitude of this change, we performed an intuitive exercise. We extrapolated from the national hourly output from wind, solar and hydro in selected countries in 2022 using projected capacities for 2030 and compared this with projected hourly demand.

We then summed the renewable output for every hour of the year and compare this to demand. This exercise showed that renewables could meet total demand in Spain for 25 percent of hours in 2030, and in Germany for 30 percent of hours, compared to 0 percent of hours in 2022<sup>10</sup>.

These numbers are intended only as an illustration of the scale of the changes coming. The number of hours for which renewables will be at the margin cannot be projected because of too many areas of uncertainty. Gasparella *et al* (2023), for example, came to a different conclusion, finding that electricity price setting will still be dominated by fossil fuels in 2030.

While the pace of change can be debated, renewable generation will ultimately dominate. This phenomenon will transform the operation of electricity markets, reducing the share of fuel costs in final electricity bills. To a certain degree, this reduction will be offset by an increase in fees and tariffs.

These include network tariffs (payments for maintaining and expanding the electricity grid), capacity mechanism payments (to power sources, such as gas power plants, that must be paid to remain on standby) and renewable levies (to pay the capital costs of renewable plants).

#### **4 The growing role for government: allocating costs**

Final electricity prices paid by households and companies (hereafter referred to as retail prices) are already influenced strongly by regulatory choices. Only one-third of the average retail electricity price paid by EU households in 2021 related to the cost of energy, while the other two-thirds was taxes (Figure 2).

Taxes weigh more on the final price paid by consumers when the volumes of electricity contracted are smaller. In the coming years, taxes, levies and other regulated components will make up an even greater share of prices, and governments will continue to decide how these costs are split between consumer groups.

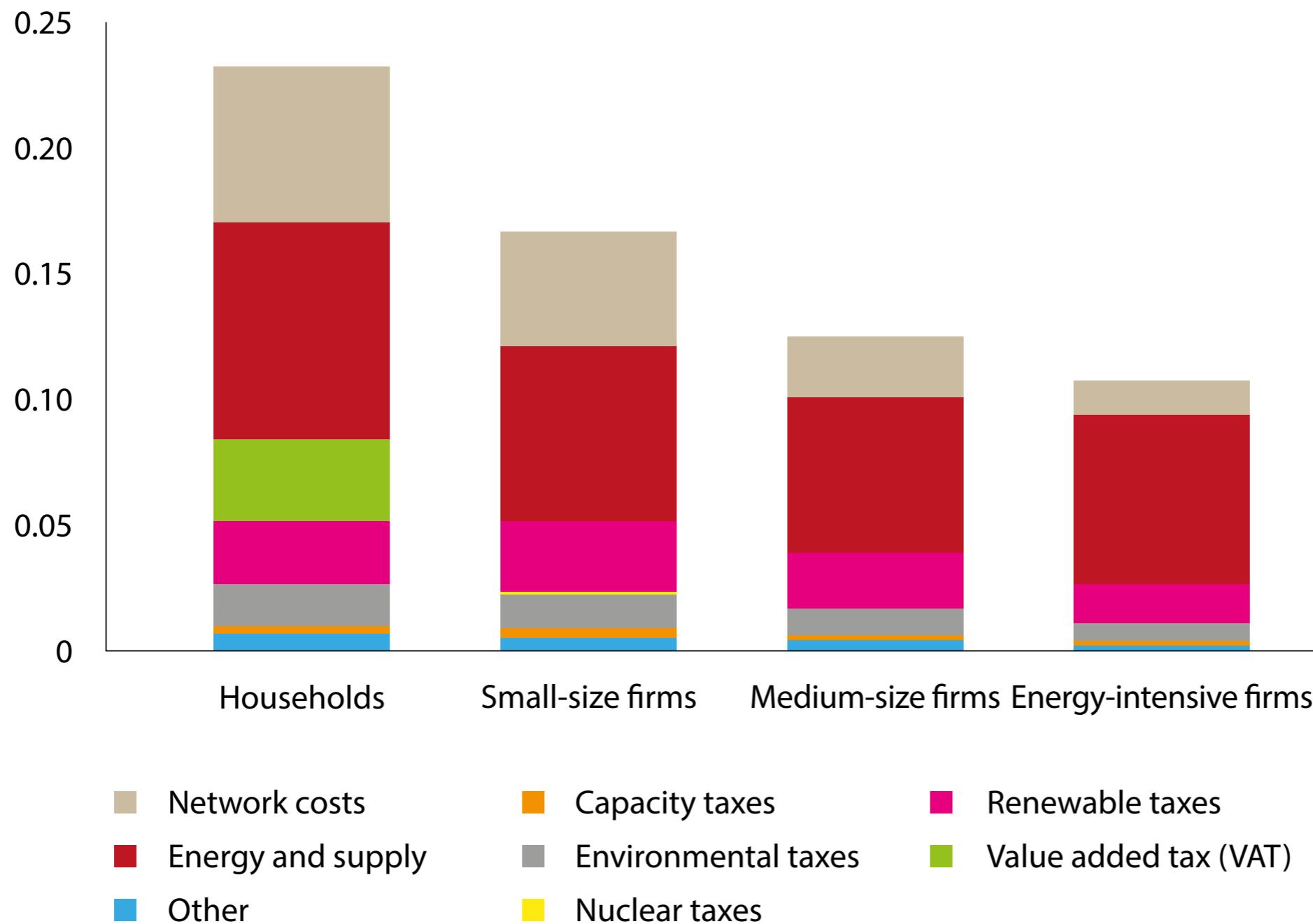
Instruments for influencing final prices include tax exemptions, reduced levies and compensatory mechanisms. For example, energy-intensive industries pay far lower network costs compared to households and less energy-intensive companies (Figure 2).

The numbers involved are very significant. In Germany, industrial consumers benefit from a broad range of overlapping rules and exceptions (German Ministry of Finance, 2023). In 2023, reductions in electricity taxes for industry were estimated to be €1.7 billion.

Reduced levies for offshore wind and combined heat and power plants amounted to an additional almost €1 billion. A further €3 billion was used to offset the increase in electricity prices paid by industrial consumers because of the EU emissions trading system<sup>11</sup>.

The existence of a single price zone across Germany also benefits electricity-intensive companies in southern and western regions, which enjoy lower wholesale prices at the expense of higher network costs that they do not pay fully.

**Figure 2. Retail electricity prices by component and user type, €/KWh, EU (2021)**



Note: Firms are generally eligible for VAT refunds, and that is the case also for some renewable taxes, such as the EEG surcharge in Germany. Small firms are the Eurostat consumption band between 20 and 499 MWh, medium firms are between 2 and 19.9 GWh, and energy-intensive firms between 70 and 149.9 GWh. Households refers to the TOT\_KWh Eurostat consumption band.

Source: Bruegel based on Eurostat.

A report on energy costs, taxes and the impact of government interventions (European Commission, 2020) found that energy-intensive industries and agriculture typically pay the lowest taxes relative to the amount of energy consumed, while road transport sectors pay the most.

The study highlights that energy-intensive industry accounts for 18 percent of energy consumption in the EU but only 2 percent of energy-tax revenues, while agriculture accounts for 3 percent of energy use and 0.5 percent of energy-tax revenue. Transport accounts for 29 percent of energy consumption and 60 percent of energy-tax revenue<sup>12</sup>. For instance, energy-tax rates on energy-intensive industries in Japan are twice those in the EU.

Network tariffs are especially likely to increase. The investment need up to 2030 for repowering European electricity grids has been estimated at €584 billion by the European Commission (2023b). To recover the costs of this investment through electricity bills, regulators will need to increase average network tariffs by 1.5 cents to 2 cents per kWh<sup>13</sup>.

If consumers pay this equally, the average rise in annual household electricity bills would be €40 to €50. If current trends continue, and additional network costs are shouldered disproportionately by households, the figure would be even higher. Reform of the EU electricity market design, agreed by the EU institutions in December 2023<sup>14</sup>, has also opened the path for substantial continued government support for renewables, which may be added to bills in the form of renewable tariffs (Zachmann *et al* 2023).

In this context, European – particularly the French and German – governments are locked in discussions over the introduction of new tools to cut the price of electricity faced by domestic firms.

## **5 A French trait d'union and a German bridge too far**

In France, the most significant mechanism affecting market prices was created in 2010 – the Regulated Access to Historic Nuclear Energy (ARENH) scheme. A large share of the French electricity supply comes from nuclear plants operated by the state-owned Électricité de France (EDF).

From 2011 until 2025, ARENH allows competing electricity retail suppliers to buy electricity produced by EDF nuclear power plants at a fixed price (of €0.042/kWh), which they then sell on to final consumers. The volumes formally covered are 100 TWh<sup>15</sup>, or approximately 25 percent of the country's total production.

The distributional effects of ARENH depend on the price level and average annual cost of nuclear production from EDF. Analysis by the French Court of Auditors assessed that at the beginning of the scheme in 2011, the fixed price was above EDF's cost of production (€0.032/ kWh), hence it only limited excess profits.

Since then, the average unit cost of production has increased and is by now above the fixed price set by ARENH (in 2021 the Court estimated EDF's production cost at €0.047/kWh). The implication is that EDF makes a loss by selling power at an artificially lower price to competitors, deflating average prices.

In November 2023, EDF and the French government agreed on a mechanism to replace ARENH after its termination on 31 December 2025. The mechanism envisages a claw-back by taxing at 50 percent all the revenues made from the nuclear production feet when the wholesale price goes above €78/MWh, and at 90 percent when the wholesale price is above €110/MWh.

These thresholds were decided to guarantee consumers a net average wholesale price of about €70/MWh for the next 15 years. The price was deemed by the government to be adequate to deliver the decarbonisation and re-

industrialisation of the country, including by reducing EDF's debt and allowing for the construction of new nuclear power plants<sup>16</sup>.

Although a final legal text is not available at time of writing, it seems clear that the scheme will cover all existing nuclear generation, but will exclude new nuclear power plants such as Flamanville 3 in north-western France.

Abandoning ARENH should also give EDF the opportunity to renegotiate and expand long-term contracts in their portfolio, targeting energy-intensive industrial consumers<sup>17</sup>.

The revenues collected by the state from the new scheme will be redistributed among all consumers, though it is not yet clear what will the distribution key will be (but given the current government's focus on re-industrialisation, one would expect industry to be the first beneficiary). To be compatible with EU competition law, the mechanism should redistribute revenues equitably to consumers based on their consumption<sup>18</sup>.

The preliminary agreement envisages a central role for the French Commission for the Regulation of Energy, which will be in charge of estimating the exact production volumes and revenues of the nuclear fleet. Redistribution should also reward consumption during off-peak hours and by season, in order to encourage load shifting. The amounts would be redistributed to all end consumers in the form of a payment passed through suppliers with an obligation to pass it on.

In Germany, meanwhile, the extent to which government should use electricity policy to support energy-intensive firms has been debated extensively. In May 2023, the German ministry for Economic Affairs and Climate Action proposed a 'bridge electricity price' for energy-intensive firms.

The idea was to guarantee to a selection of companies from energy-intensive industries a price of €0.06/kWh for 80 percent of their electricity consumption, to aid their international competitiveness. The subsidies would amount to between €2 billion and €9 billion annually<sup>19</sup>.

However, this proposal was opposed by the German finance ministry and many economists (including Bernhardt et al, 2023). A finance ministry advisory board feared that excessive subsidies would impede necessary structural adjustment and highlighted that energy-intensive consumers already benefit from a variety of tax exemptions.

In November 2023, the government agreed in principle on a modified scheme. Electricity taxes would be reduced for all manufacturing companies to the EU minimum level of 0.05 eurocents per kWh (from 1.54ct/kWh).

Most other European countries already have tax rates at the minimum level. Energy-intensive firms were largely exempt from the tax anyway, so this move is more beneficial for non-energy-intensive firms, which were paying the full rate.

The plan would also extend existing support measures for energy-intensive industries, based on reimbursing costs arising from European carbon taxes, but no fresh support would be given to energy-intensive firms. The government had already announced a €5.5 billion subsidy to stabilise network fees for all consumers<sup>20</sup>.

The agreement was therefore focused on reducing electricity prices for all companies, rather than only energy-intensive companies. This suggests that concerns about harming overall economic growth by supporting only a handful of energy-intensive firms were heeded.

However, whether and when the plan will be implemented is unclear because of a November 2023 German Constitutional Court on strict enforcement of public financing limits<sup>21</sup>. This might necessitate a new discussion of the planned electricity tax cuts.

## **6 Transforming European electricity: who will pay?**

During the 2020s, governments will spend billions of euros transforming electricity grids. Exactly how to distribute these costs across society implies several trade-offs:

1. Recovering costs through electricity tariffs or general taxation,
2. The split of taxes between households and industry,
3. The split of taxes between energy-intensive and the remaining industry,
4. Crossborder impacts of subsidies; and,
5. Trade-offs to consider when attracting clean technology manufacturing.

A first principle is that any tax exemption or public support for a certain consumer type implies an increase in costs for other consumers, for both fiscal and physical reasons. Fiscally, when one group is exempted from paying taxes, these taxes must be collected elsewhere. The physical reason relates to the functioning of electricity markets.

Government subsidies reduce the incentives for recipients to reduce electricity consumption, through substitution, energy efficiency or relocation. In the short run (up to a few years), electricity supply is relatively fixed<sup>22</sup>.

Therefore, an increase in electricity consumption by one group must be offset by an equal decrease elsewhere, or prices for all other consumers increase, until demand and supply balance again.

### 6.1 Electricity tariffs vs general taxation

Currently, governments recover costs for renewable and grid subsidies by adding them to electricity bills (eg. 'network tariffs'). The logic is that the costs of providing a good in addition to the good itself, such as electricity, should be met by those consuming it. For example, dedicated road-traffic taxes and charges generally pay for expenditure on road infrastructure for European countries (Schroten, 2017).

The alternative is to finance renewables, networks and other necessary investments through general taxation. Public goods such as education are funded in this way, based on the principle that they benefit society as a whole. A similar argument could be made for electricity consumption.

During 2022 and 2023, as electricity prices soared, many governments made the decision to temporarily shift electricity taxes onto the general budget<sup>23</sup>. It remains to be seen whether this will set a precedent for the coming years. Electricity prices have dropped substantially and will likely drop further, suggesting tariffs might be revived.

However, achieving climate goals requires households and companies to substantially increase electricity demand. Lowering tariffs on electricity bills is one option to encourage such behaviour.

### 6.2 Industry vs households

Within electricity markets, the starker difference in tax treatment currently concerns households and companies (Figure 2). The standard decision European governments have taken is to impose a larger share of energy taxes on households to subsidise the electricity consumption of companies. As governments push households to consume more electricity, pressure will grow to reverse this policy.

In the past this was perceived as less of an issue as household electricity consumption was seen as a good proxy for affluence (relating to ownership of consumer goods) and consumers were not very sensitive to higher prices. This has changed as consumers can increasingly choose between ‘clean’ electricity for transport and heating, and fossil fuels. Hence, relative prices matter for the speed of the desired transition.

The average household in Germany currently consumes around 3,500 kWh electricity per year<sup>24</sup>. Before the crisis, with a typical household retail price of €0.20/kWh this resulted in an annual bill of €700. The same average household might have also spent €1,500 to fuel a car and €1,000 to heat their home with natural gas.

The household will shift both expenses onto their electricity bill if they install a heat pump and buy an electric car. A heat pump is estimated to increase consumption by 4,900 kWh and an electric car by 3,000 kWh.

Therefore, while the average household energy bill would decrease, electrification implies that the annual average household electricity bill may grow from €700 to €2,300<sup>25</sup>. Distributional decisions on renewable tariffs will become much more relevant.

### 6.3 Taxing energy-intensive vs general industry

Governments also decide to distribute costs between industry depending upon the volume of their energy consumption. Typically, this involves lowering the bills of energy-intensive firms. The rationale is that for these firms, energy costs make up a large share of final production costs, and typically they face substantial international competition.

Providing them with cheaper access to energy is seen as necessary for keeping them competitive on global markets. The relative importance of energy-intensive industries varies significantly across the EU, which influences rates of taxation (see the annex).

The economic logic of subsidising energy-intensive firms is controversial. Some level of support is justified as compensation for the higher carbon costs in the EU compared to international competitors.

However, companies that are energy intensive typically produce lower value added per unit of electricity consumption. They also employ fewer people (Figure 3 summarises this for Germany).

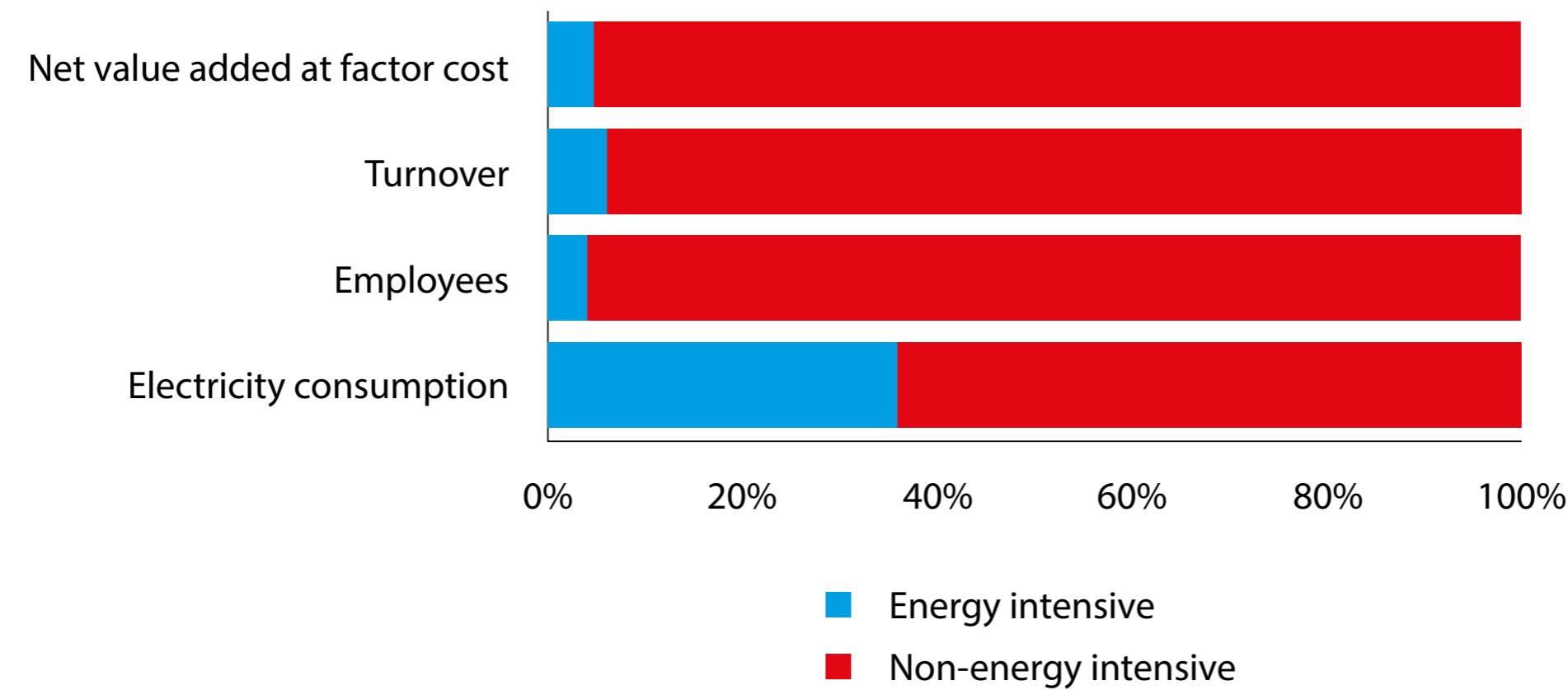
Therefore, any intervention which raises electricity consumption by such firms has the first-order effect of shifting consumption toward firms that transform electricity into lower value added, potentially slowing down economic growth. There is a risk of path-dependency where subsidies become locked in (Fouquet, 2016).

There are two counterarguments to this. The first is that the view ignores second-order effects, and the second is that the goods produced by energy-intensive industries have 'economic security' value. The second-order effects argument is that energy-intensive firms produce goods that are vital inputs for manufacturing stages further along the value chain. The argument follows that if energy-intensive firms were to slow production, there would be ripple effects onto other sectors of the economy (Krebs, 2023).

We question this argument on intuitive and empirical grounds. Intuitively, one of the most prominent arguments for energy-intensive subsidies is that firms face fierce international competition. This suggests well supplied markets in which international competitors could replace domestic production.

The energy price shock of 2022 provided an empirical test of this hypothesis. The result was that substantial drops in industrial production from energy-intensive firms were not passed through to the rest of the economy.

**Figure 3. German energy-intensive vs non-energy-intensive industries (% of total industry value)**



Note: energy-intensive industries include the following WZ codes 1411, 1711, 1712, 1920, 2011, 2013, 2016, 2314, 2410, 2442, 2443, 2444, 2445, 2451.

Source: Bruegel on DeStatis data.

In 2023, output from energy-intensive manufacturing in the EU was 14 percent less than in 2021, while output from overall manufacturing increased by 3 percent<sup>26</sup>. This evidence is a strong rebuttal of the argument that domestic supply chains depend on local energy-intensive production.

It suggests a reality in which trade and substitution along value chains mutes any impact. A detailed description of this is found in Moll *et al* (2023), who found overall industrial production to be decoupled from production in energy-intensive sectors.

The second counterargument is that certain products are critical to a country's economic security and should be protected. This argument has merit; however, the definition of a product's contribution to a country's economic security is more nuanced than simply that sector's average consumption of electricity.

While there may be a correlation between electricity consumption and contribution to economic security, it is not one-for-one. Supporting an industry or firm on the grounds of economic security should instead be on a case-by-case basis.

#### 6.4 Between European countries

EU governments have different capacities to support national industries. The absence of European coordination runs the risk of an intra-European subsidy race that will harm the internal market and especially those countries with more limited fiscal space (similarly to what happened in the semiconductor sector; Garcia-Herrero and Poitiers, 2022).

The consequences will be to artificially increase the competitiveness of energy-intensive companies in countries that offer support, relative to European neighbours.

The dynamics discussed above in relation to skewing electricity consumption away from other consumers very much also apply between countries. Any increase in one country's consumption means that other countries in the internal electricity market must consume less and will face higher electricity prices.

The situation is like that during the energy crisis when European governments competed in a subsidy race, which ultimately raised the price of a limited supply of gas.

### 6.5 Whether to attract clean technology manufacturing

The production of many clean technologies involves electricity-intensive manufacturing stages, such as the refining of polysilicon for solar panels, or the production of battery cells.

The EU's proposed Net Zero Industry Act (NZIA; not yet finalised at time of writing) would set a goal for domestic manufacture of at least 40 percent of total EU demand in most clean-technology sectors. European governments are rolling out subsidies to attract clean-technology factories.

Just like legacy energy-intensive production, this new wave of clean tech will face the same dynamics in competing for electricity generation. The numbers are substantial. Meeting 40 percent of the EU's solar supply domestically will require the capacity to refine polysilicon for producing 30 GW solar wafers, which will consume around 24,000 GWh per year or 1 percent of total EU electricity demand today<sup>27</sup>.

Meanwhile meeting 40 percent of battery demand will require 220 GWh cell production, consuming 13,000 GWh per year or 0.5 percent of current EU electricity demand<sup>28</sup>. This does not take into account the additional electricity requirements for raw material extraction and refining. The huge energy consumption of these facilities implies a major role for policy and industry in deciding where to locate them.

## **7 Conclusions**

Germany and France have so far resisted the temptation to generously subsidise energy-intensive industry. This is good news. This would have had consequences for the integrity of the European single market and non-energy intensive domestic consumers. Their debates show that electricity policy is central to industrial policy. This will become even more the case in the coming years. First, electricity's share of final energy demand will grow, with transport and demand sectors in particular shifting consumption to electricity.

Second, the share of renewables will grow. This implies that actual market prices will decrease. However, there will be a growing share of taxes for governments to distribute between consumers. We identify the following five areas as critical for framing future debates on electricity pricing policy:

- i) recovering expenses via electricity tariffs or general taxation,
- ii) the relative tax split between households and industry,
- iii) the relative tax split between energy-intensive and non-energy-intensive industry,
- iv) the crossborder effects of one country's subsidies, and
- v) high electricity consumption associated with the manufacture of clean technologies that Europe is looking to attract. ■

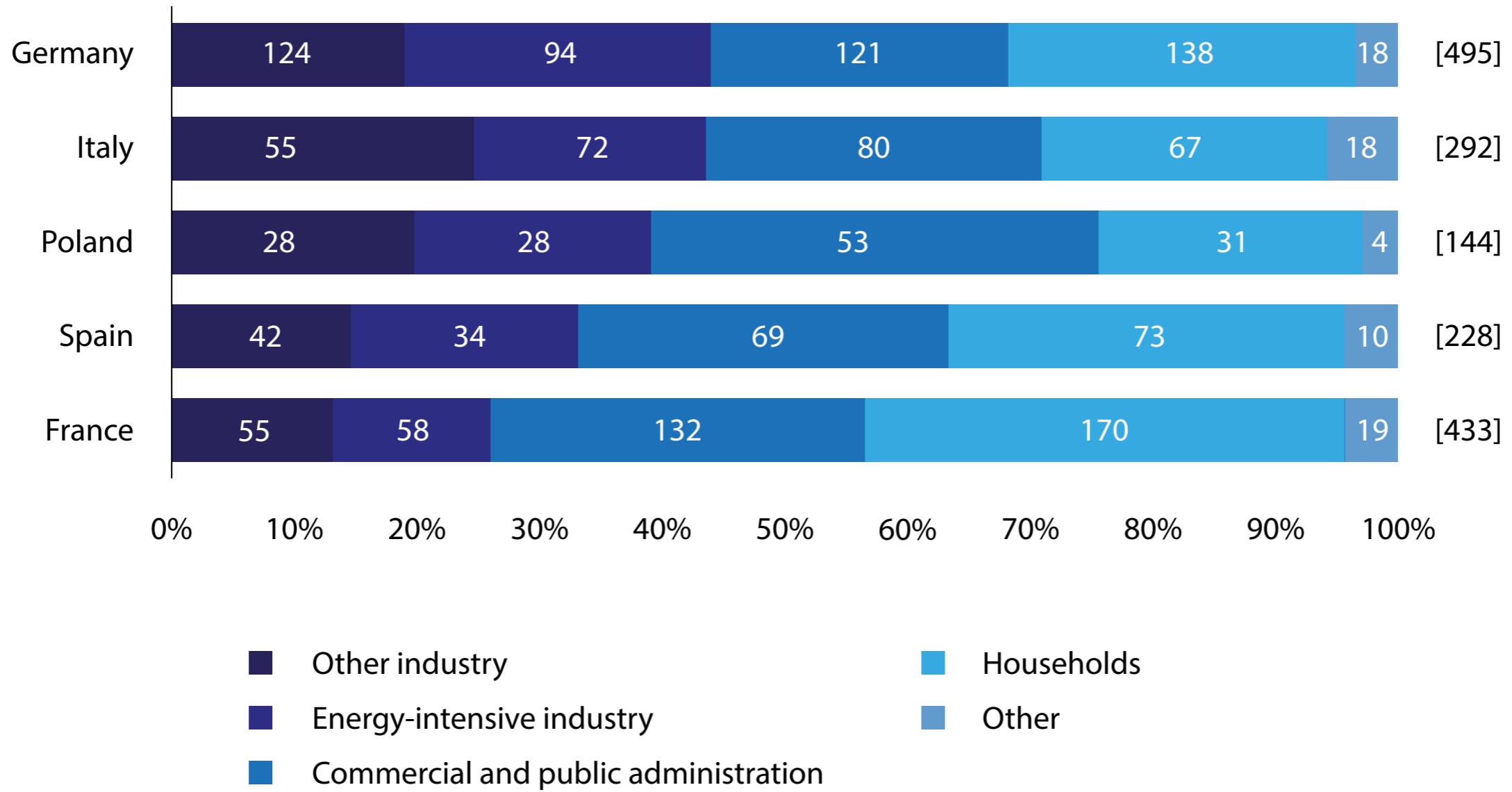
**Ben McWilliams is an Affiliate Fellow, Giovanni Sgaravatti is a Research Analyst, and Simone Tagliapietra and Georg Zachmann are Senior Fellows, at Bruegel**

## **Annex A1. Country variation in the importance of energy-intensive industries**

The importance of the energy-intensive industrial sector in overall electricity consumption varies by country within the EU. The share is highest in Germany with 25 percent of electricity consumption going to energy-intensive firms, and lowest in France at just over 10 percent.

Energy-intensive electricity demand in Germany is almost equal to total Polish electricity demand, or half of total Spanish electricity demand (Figure 1A).

## **Figure A1. Share of electricity consumption by consumer type, TWh, 2021 (totals)**



*Note: energy-intensive industry includes basic metals, chemicals, non-metallic minerals and paper and pulp.*

*Source: Bruegel based on Eurostat.*

## Endnotes

1. French and German ministers, for example, have called for measures to tackle Europe's disadvantage on energy. See Jonathan Packroff, '[Germany's Habeck calls for 'Zeitenwende' on industrial subsidies](#)', Euractiv, 24 October 2023, and Euronews with AFP, '[Europe needs 'coordinated, united and strong response' to massive US subsidies - Le Maire](#)', Euronews, 7 November 2022.
2. See BAFA press release of 21 December 2017, '[Special compensation regulation contributes to the stabilization of the EEG levy](#)'.
3. C/2023/1188, available at <https://eur-lex.europa.eu/eli/C/2023/1188/oj>.
4. See European Commission press release of 20 November 2023, '[Commission adjusts phase-out of certain crisis tools of the State aid Temporary Crisis and Transition Framework](#)'.
5. Approved support refers to budgeted allocation and does not necessarily correspond to final disbursement.
6. See, for example, Varg Folkman, Giorgio Leali and Aoife White, '[France and Germany risk EU rift over energy subsidies](#)', Politico, 26 October 2023.
7. See [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Energy\\_statistics\\_-\\_an\\_overview#Final\\_energy\\_consumption](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Energy_statistics_-_an_overview#Final_energy_consumption).
8. See [Ember electricity data explorer](#).
9. For example, if renewables provide 90 percent of supply but the missing 10 percent is provided by natural gas, the price will be set equal to the price of gas.
10. The exercise was done using ENTSO-E data (ENTSO-E, 2022), and was based on announced government plans available to ENTSO-E for their 2022 analysis. The Spanish government has since increased targets.
11. The introduction of the emissions trading system, which puts a carbon price on fuels used to generate electricity, raised average wholesale prices. European governments are permitted under state aid to provide 'indirect cost compensation' to compensate for this.
12. Fuel taxes also address strong externalities, including paying for public road infrastructure.

13. This assumes financing costs between 5 percent and 7 percent for the period 2024-2030, and repayment of the principal in 40 years.
14. See Council of the EU, '[Electricity Market Reform](#)'.
15. In reality the volumes sold by EDF at a regulated price are much higher. In 2022, EDF reported providing 120 TWh to alternative suppliers under ARENH and around an extra 55 TWh to households at regulated tariffs established under the French Energy Code, adding to the wholesale ARENH price capacity guarantees, transmission and marketing costs, as well as a normal rate of return on investment. Moreover, in 2022 EDF reported supplying 75 TWh at capped prices and about 25 TWh of grid losses also sold at the ARENH price (EDF, 2022, p.37).
16. See French government consultation document of 21 November 2021, '[Projet de dispositif de protection des consommateurs d'électricité à partir du 1er janvier 2026](#)'.
17. André Tomas, 'Prix de l'électricité: après son accord avec l'État, EDF devra convaincre ses clients industriels', Ouest France, 22 November 2023; BFM Business, '[EDF va proposer des contrats adossés à des actifs nucléaires aux plus gros consommateurs](#)', 21 November 2023.
18. Even then, it might raise some concerns if effective electricity taxes are negative and hence below EU minimum values.
19. For our calculations, we assumed the subsidies would have covered the 2,200 energy- and trade-intensive companies that were exempted from paying the renewables levy in 2021. They consumed approximately 120 TWh (out of total German industrial demand of 220 TWh), 80 percent of which would be about 100 TWh.
20. See German government press release of 9 November 2023, '[Energie bezahlbar halten](#)'.
21. In Germany, a strict no-debt rule (the so-called 'debt brake') is applied to government finances. On the impact of the Constitutional Court ruling on government climate spending, see Georg Zachmann, '[Bypassing the German debt brake and continuing climate spending](#)', First Glance, 30 November 2023, Bruegel.
22. Adding new generation capacities to the electricity grid takes a few years. Therefore, increasing electricity supply in the short run requires operating existing facilities at higher capacities. Concretely, this means raising output from natural gas and coal plants. Global natural gas markets remain very tight which limits room for manoeuvre, and raising output from coal plants is limited by environmental regulation as part of the EU's ongoing phase out.

23. See Bruegel Dataset, '[National fiscal policy responses to the energy crisis](#)'.
24. See Benjamin Wehrmann, '[What German households pay for electricity](#)', Clean Energy Wire, 16 January 2023.
25. Household consumption increases from 3,500 kWh per annum to 11,400 kWh. A heat pump increases consumption by 4,900 kWh (Schlemminger et al 2022) and an [EV by 3,000 kWh, if driving 15,000 km at 195Wh/km](#). Constant price of 0.20 eurocents per kWh. Average fuel price for car estimated as 15,000 km driven at six litres per 100km efficiency and a fuel price of €1.70/litre. Natural gas consumption assumed at 12,000 kWh with a retail price of 8 eurocents per kWh.
26. Author's analysis on Eurostat database [sts\\_inpr\\_m](#).
27. Assuming 3,000 tonnes of polysilicon are required per gigawatt of solar wafer capacity, and 270kWh electricity is required to refine 1kg of polysilicon (Hallam et al 2022).
28. Assuming 60 kWh electricity demand per kWh cell production (Davidsson Kurland, 2019).

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# A call for global collaboration

Ursula von der Leyen's message at the WEF is that countries and businesses need to closely collaborate in facing the challenges of today and tomorrow



The World Economic Forum's *Global Risk Report* makes for a stunning and sobering read. For the global business community, the top concern for the next two years is not conflict or climate. It is disinformation and misinformation, followed closely by polarisation within our societies. These risks are serious because they limit our ability to tackle the big global challenges we are facing: changes in our climate – and our geopolitical climate; shifts in our demography and in our technology; spiralling regional conflicts and intensified geopolitical competition and their impacts on supply chains.

The sobering reality is that we are once again competing more intensely across countries than we have in several decades. And this makes the theme of this year's Davos meeting even more relevant. 'Rebuilding trust' – this is not a time for conflicts or polarisation.

This is the time to build trust. This is the time to drive global collaboration more than ever before. This requires immediate and structural responses to match the size of the global challenges. I believe it can be done. And I believe that Europe can and must take the lead in shaping that global response.

The starting point for that is to look deeper at the *Global Risk Report* to map out a way forward. Many of the solutions lie not only in countries working together but crucially on business and governments – business and democracies – working together.

It has never been more important for the public and private sector to create new connective tissue. Because none of these challenges respect borders. They each require collaboration to manage risks and forge a path forward.

While governments hold many of the levers to deal with the great challenges of our time, businesses have the innovation, the technology and the talents to deliver the solutions we need, to fight threats like climate change or industrial-scale disinformation.

Europe is uniquely placed to show how this can work. Because our democracies and our businesses have interests that align: creating prosperity, wealth and security for people, creating a stable environment to unlock innovation and investment, and creating equal opportunity and freedom.

This is more important than ever as we start 2024 – the biggest electoral year in history. Democracies across the world will head to the polls, and half of the global population will be affected; this includes over 450 million people

*Overreliance on one company, one country, one trade route comes with risks. That is why the European Green Deal puts such strong emphasis not just on reducing emissions but also on a strong, competitive European presence in the new clean energy economy*

in the European Union. A Union of 27 democracies where all of us have the right to speak our mind, to be ourselves, even if we are different from the majority.

In a democracy it is the people, with their choices and behaviours, who pick winners and losers in the economic arena. Companies are free to compete. Changemakers are free to innovate. Merit determines economic success. And our rules are built to ensure this: to protect intellectual property, the safety of industrial data, or the savings of people and companies. And Europe stands up for global trade based on fair and open markets.

Of course, like in all democracies, our freedom comes with risks. There will always be those who try to exploit our openness, both from inside and outside. There will always be attempts to push us off track, for example with disinformation and misinformation.

And nowhere has there been more of that than on the issue of Ukraine. So let me provide you with some real information. Russia is failing on strategic goals. It is first and foremost a military failure. We have not forgotten that when Russia invaded Ukraine, many feared that Kyiv would fall in just a few days, and the rest of the country within weeks. This did not happen.

Instead, Russia has lost roughly half of its military capabilities. Ukraine has driven Russia out of half of the territories it had captured. Ukraine has pushed back Russia's Black Sea Fleet and reopened a maritime corridor to deliver the grain to the world. And Ukraine has retained its freedom and independence.

Russia's failure is also economic. Sanctions have decoupled its economy from modern technology and innovation. Russia is now dependent on China. And finally, Russia's failure is also diplomatic. Finland has joined NATO. Sweden will follow soon. And Ukraine is closer than ever on its path to the European Union.

All of this tells us that Ukraine can prevail in this war. But we must continue to empower their resistance. Ukrainians need predictable financing throughout 2024 and beyond. They need a sustained supply of weapons to defend Ukraine and regain its rightful territory. They need capabilities to deter future attacks by Russia. And they also need hope.

They need to know that, with their struggle, they will earn a better future for their children. And Ukraine's better future is called Europe. It was with immense joy that last month we decided to launch the accession negotiations for Ukraine's EU membership. This will be Ukraine's historic achievement. And it will be Europe responding to the call of history.

We all know that Russia's invasion has also had an impact on the cost of living and the cost of doing business here in Europe. I know how much that has affected everyone. But I started by saying that the risks we face require collaboration between countries and business and that our joint capacity to respond was far stronger than we might believe.

And nowhere is this best exemplified than when it comes to energy and sustainability. Two years ago, before Russia's aggression against Ukraine, one in five units of energy consumed in the European Union in 2021 was imported from Russia. This high dependence on Russia was widely recognised as a risk, especially after Russia's occupation of Crimea. And then came Russia's invasion of Ukraine.

Russia had already increased Europe's vulnerability by deliberately not filling gas storages to their usual levels. And in the face of Ukrainian heroism and European solidarity, Putin decided that the time had come to threaten Europe directly by cutting gas supplies and using energy as his weapon.

We all carry the bruises from Putin's decisions. We faced difficult choices and uncertainties, especially during the winters. But we made the right choices. Now, only two years later, Europe has taken its energy destiny back into its own hands.

Last year, one in twenty units of energy consumed in the European Union came from Russia. Sure, the crisis checked momentum in the European economy but fears of economic collapse proved unfounded. And now energy prices have come down and stayed low even during the recent cold snap at the start of January. Gas storages are still well supplied.

Europe has made real progress in improving the resilience of its energy system. How was this possible? Because we acted in collaboration. Because we had well-functioning and open markets and good friends around the world that stepped in and stepped up alternative supplies.

Because we had a Single Market that allowed us to redirect flows of energy to where it was needed. But most of all, because we doubled down on clean energy transitions, investing in the clean, efficient and renewable technologies of the future.

European industries and companies have been central to this. Latest numbers from the International Energy Agency show that growth in renewable energy capacity hit another record in the European Union in 2023. And the European Union improved the efficiency of its energy use – the best energy is the one that is not used – by almost 5%.

In this way, we turned Putin's challenge into a major new opportunity. Last year, for the first time, the European Union produced more electricity from wind and sun than from gas. And this year, for the first time, the European

Union is set to get more overall energy from wind and solar photovoltaic than it does from Russia. That is good news.

But amid the reasons for optimism, let us not forget a key lesson from the crisis. Overreliance on one company, one country, one trade route comes with risks. That is why the European Green Deal puts such strong emphasis not just on reducing emissions but also on a strong, competitive European presence in the new clean energy economy. This includes Europe's leadership in clean energy technology, development and innovation.

Let me go back to the number one concern of the *Global Risk Report*: disinformation and misinformation. Tackling this has been our focus since the very beginning of my mandate. With our Digital Services Act, we defined the responsibilities of large internet platforms on the content they promote and propagate. A responsibility to children and vulnerable groups targeted by hate speech but also a responsibility to our societies as a whole. Because the boundary between online and offline is getting thinner and thinner. And the values we cherish offline should also be protected online. This is even more important in this new era of generative AI.

Now the World Economic Forum *Global Risk Report* puts artificial intelligence as one of the top potential risks for the next decade. First of all, let us not forget that AI is also a very significant opportunity, if used in a responsible way. I am a tech-optimist. And as a medical doctor by training, I know that AI is already revolutionising healthcare. That is good.

AI can boost productivity at unprecedented speed. First movers will be rewarded, and the global race is already on, without any question. Our future competitiveness depends on AI adoption in our daily business. And Europe must up its game and show the way to responsible use of AI. That is artificial intelligence that enhances human capabilities, improves productivity and serves society.

We should invest where we have a competitive edge. For instance, Europe has got talent. There are nearly 200,000 software engineers in Europe with AI experience. That is a greater concentration than in the United States and China. And our continent also has a huge competitive edge when it comes to industrial data. We can train artificial intelligence on data of unrivalled quality, and we want to invest in this.

This is why we will provide European start-ups and SMEs with access to our world-class supercomputers, so that they can develop, train and test their large AI models. This is similar to what Microsoft is doing for ChatGPT, by running it on its own supercomputers.

We will also put common European data spaces at the service of start-ups. And we will make available massive amounts of data in all EU languages, because AI should work also for non-English speakers. This is the new frontier of competitiveness. And Europe is well positioned to become the leader of industrial AI – the use of AI to transform critical infrastructures to become intelligent and sustainable.

When we took office four years ago, we felt the need to set clear guard rails at European level, to guide the development and deployment of artificial intelligence. This is the thinking behind Europe's Artificial Intelligence Act, actually the first of its kind anywhere in the world and another example of how democracies and businesses can help strengthen each other.

The Artificial Intelligence Act builds trust by looking at high-risk cases, like real-time biometric identification. And by building that trust, it enables companies to innovate in all other fields to make the most of this new and revolutionary technology.

Our world is in an era of conflict and confrontation, of fragmentation and fear. For the first time in generations, the world is not at a single inflection point. It is at multiple inflection points, with risks overlapping and compounding each other. And there is no doubt that we face the greatest risk to the global order in the post-war era.

But in my mind, there is also no doubt that we can move forward with optimism and resolve. Yes, the risks we face are real and present. But in order to face risks we have to take risks – together. This is what Europe has always done. The European Union is at its best when we are bold, as we have seen only in the last few years on the European Green Deal, NextGenerationEU, supporting Ukraine or facing up to the pandemic.

The next years will require us to think in the same way. And I believe the common power of our democracies and our business and industry will be at the heart of this. Our companies thrive on freedom – to innovate, to invest and to compete. But freedom in business relies on the freedom of our political systems.

This is why I believe strengthening our democracy and protecting it from the risks and interference it faces is our common and enduring duty. We need to build trust more than ever and Europe is prepared to play a key role. ■

### **Ursula von der Leyen is President of the European Commission**

*This article is based on a [speech](#) delivered at the World Economic Forum in Davos, Switzerland, 16 January 2024.*



# Smarter European Union industrial policy for solar panels

The EU plans to double solar PV capacity by 2030. Ben McWilliams, Simone Tagliapietra and Cecilia Trasi argue that the EU carry on importing from China but implement an industrial policy that intervenes in sectors that are more likely to contribute to sustainable economic growth

## Executive summary

The European Union plans a major increase in solar PV capacity from 263 GW today to almost 600 GW by 2030. If nothing changes, this expansion will be based almost exclusively on solar panels imported from China, which supplies over 95 percent of solar panels used in the EU. This dependence has raised concerns about EU economic security and geopolitical vulnerabilities, especially in light of recent global disruption.

The EU has agreed in principle a non-binding 40 percent self-sufficiency benchmark for solar panels and other identified strategic technologies, to be approached or achieved by 2030. However, for the solar sector specifically, there is no strong economic justification for an import-substitution approach. Such a strategy risks increasing the costs of solar panels, slowing deployment and creating industries that are over-reliant on subsidies.

EU solar manufacturing subsidies are not appropriate based on criteria of European production alone. Subsidies could, however, be justified on innovation grounds, by supporting new solar products that have a real chance to develop into sustainable industries that contribute to climate goals.

To address concerns about short-term dependence, alternative tools should be employed: accelerated solar deployment, strategic stockpiling and gradually diversifying import sources. In the longer term, recycling of solar panels deserves greater attention and funding.

In terms of strengthening economic resilience relative to China, Europe should implement an industrial policy that intervenes in sectors that are more likely to contribute to sustainable economic growth and alleviate decarbonisation bottlenecks.

## **1 The 'kingpin' of Europe's energy transition**

Solar power promises to be a major engine of Europe's energy transition. By 2030, European Union countries aim to reach the target of almost 600 gigawatts<sup>1</sup> of installed solar photovoltaic (PV) capacity as set out in the European Union's Solar Energy Strategy (European Commission, 2022a) – up from around 263 GW today<sup>2</sup>.

If this target is met, solar PV will become the largest source of electricity production in the EU by capacity. Not only that, but the rate of solar deployment will be faster than any other; plans for increasing wind capacity, for example, aim at reaching around 500 GW by 2030, up from 200 GW today (European Commission, 2023a).

*The European solar revolution is, and will continue to be, predominantly 'made in China'*

This European solar revolution is, and will continue to be, predominantly ‘made in China’. In 2022, over 95 percent of Europe’s solar panels came from China<sup>3</sup>, which has established itself as the global hub for solar PV manufacturing (IEA, 2023).

Chinese solar panels are becoming cheaper and also more innovative (ETIP PV, 2023). This is good news for the EU as it enables the acceleration of the deployment of solar energy in a cost-effective manner. However, such a high import dependency on a single supplier could expose the EU to the economic risks related to high market concentration and, potentially, to the risks related to an eventual geopolitical use of this dominant position.

Pandemic-related supply chains disruptions, the energy crisis, the increasing assertiveness of Chinese export controls on critical raw materials and competitiveness pressures arising from the United States’s Inflation Reduction Act, have worried and continue to worry European policymakers.

This has led to a fresh debate on how to define and pursue economic security and, more tangibly, to a revival of new industrial policy initiatives aimed at fostering EU competitiveness and geopolitical resilience in clean technologies and critical raw materials (European Commission, 2023b).

In February 2024, the EU institutions agreed in principle on the Net-Zero Industry Act (NZIA), with the aim of supporting domestic manufacturing of clean technologies, such as solar PV, as strategic projects. Part of the NZIA is a plan to ensure that EU manufacturing of strategic net zero technologies ‘approaches or reaches’ a benchmark value of 40 percent of the EU’s deployment needed by<sup>4</sup>.

This approach risks relying heavily on import substitution. This is controversial because it disregards the costs of promoting self-sufficiency compared to the use of cheaper imports and, more broadly, because it signals a turn towards protectionism (Tagliapietra *et al* 2023a).

Furthermore, adopting a flat benchmark value for different technologies in which Europe has a very different starting positions and very different growth potentials is not economically rational. In this context, this Policy Brief evaluates specifically the case of solar PV manufacturing.

We start by describing the characteristics of solar PV supply chains, and then outline the diverging historic and current trajectories of Europe and China in solar PV manufacturing. We evaluate the economic case for European intervention to stimulate domestic manufacturing, finding that there are no clear decarbonisation or economic growth benefits from doing so – leaving mitigating the risk of over-dependence on Chinese imports as the only justification. Even this risk should not be exaggerated. Innovation and not domestic content should be the defining criteria for manufacturing subsidies.

## **2 Solar PV manufacturing and the EU's situation**

### **2.1 Understanding solar PV supply chains**

Any industrial policy strategy in the solar sector should be rooted in an understanding of the complexities of solar PV supply chains. The solar industry encompasses so many manufacturing processes that the concept of 'public support for solar PV manufacturing' is an oversimplification.

The production of a solar panel begins with quartz ( $\text{SiO}_2$ ), commonly found in sand. This is transformed into polysilicon by an energy-intensive process of melting and purification. Polysilicon is used for the production of solar panels, semiconductors and electronic devices. China accounts for around 80 percent of global polysilicon production capacity (IEA, 2022).

Around 35 percent of global polysilicon production capacity is located in Xinjiang, a Chinese region under international scrutiny for violation of human rights and forced labour involving Uyghurs and other Muslim-majority groups (Box 1).

Europe has 11 percent of global polysilicon production capacity (Bettoli *et al* 2022), amounting to 26 GW in 2023 (SolarPower Europe, 2023). However, this capacity is largely used to deliver higher quality polysilicon for semiconductor production, not for solar panels (Basore and Feldman, 2022).

Within the solar industry, polysilicon is melted to form ingots, which are then sliced into thin wafers. This is a capital- and energy-intensive process, which benefits heavily from economies of scale. Almost all current ingot and wafer manufacturing is in China, with half of global capacity coming from just eight Chinese plants (Basore and Feldman, 2022).

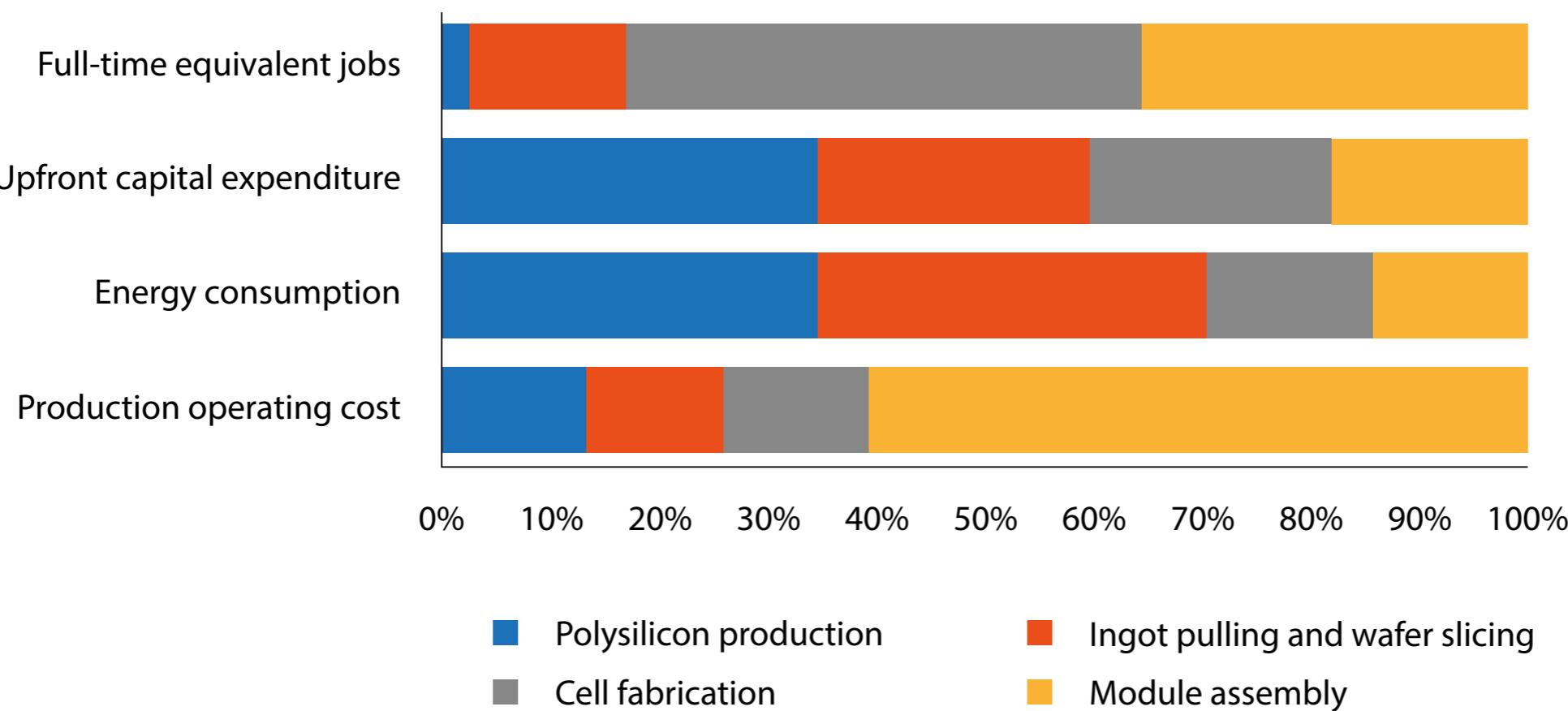
Wafers are then processed to produce cells in a highly automated system. Finally, cells are assembled into modules and sandwiched with other components including glass and aluminium frames. Along this value chain, the earlier stages are capital- and energy-intensive, while later stages account for the greater share of jobs and production cost (Figure 1).

Operating at the end of the value chain, module assemblers outside China typically import solar cells – the core component of the module. Module-assembly factories do not require high investment or substantial set-up time (ETIP PV, 2023). Production lines can be deployed in just one or two years.

This means factories can be paused and then restarted quickly and easily. Many of the new factories planned in the EU will focus on module assembly because it is flexible and can adapt quickly to changes in the market or in policy. The EU has 10 GW capacity for assembling modules but this currently operates at only about 10 percent capacity<sup>6</sup>.

The estimated capacities of European manufacturers at each stage of the value chain are shown in Figure 2. This contrasts with estimated deployment in 2023 of 60 GW.

**Figure 1. Distribution of economic indicators across the solar manufacturing chain**



Source: Bruegel based on Woodhouse et al (2021), ESIA, BNEF.

### **Box 1: Forced labour in the solar supply chain**

Allegations of forced labour have been made about polysilicon factories in Xinjiang, China. State-sponsored work programmes have been criticised for their coercive nature, often under the guise of poverty alleviation and anti-terrorism strategies. Evidence reported by the United Nations indicates that many Uyghur workers are subjected to conditions tantamount to forced labour and enslavement, unable to refuse work without the threat of re-education and internment (OHCHR, 2022). Further research highlighted that several major solar companies are implicated in the use of forced labour. Firms including Daqo, TBEA, Xinjiang GCL and East Hope, which account for more than a third of global solar-grade polysilicon supply, are implicated.

The issue extends beyond China, with evidence of forced labour also found in Malaysian factories<sup>5</sup>, but the Chinese industry's dependence on supply from Xinjiang, combined with opaque reporting practices, complicates the avoidance of products produced using forced labour (Crawford and Murphy, 2023). This has led to a call for greater transparency and accountability within the industry.

The international response to these findings has varied. Following the anti-dumping and countervailing duty tariffs in place since 2012, 2015 and 2018, the United States blocked the import of solar panels and components from China with the Uyghur Forced Labor Prevention Act, in force since 2022 (The White House, 2021). The United Kingdom, under its Modern Slavery Act, requires companies with turnover above £36 million to report their efforts to prevent modern slavery in their supply chains.

In 2022, the European Commission (2022b) proposed an EU market ban on products made with forced labour. The regulations require companies to conduct due diligence to ensure that solar panels are produced ethically and sustainably.

If the EU wishes to use import substitution to reduce dependency on China, it must have a granular industrial policy that supports the development of all stages of the solar manufacturing value chain<sup>7</sup>. While a sole focus on module assembly will have the biggest jobs and economic impact, it will not improve import resilience as producers would remain reliant on imported cells.

It will be difficult for the EU to develop substantial capacities in earlier value-chain stages, which are capital- and energy-intensive, especially as energy prices have remained somewhat elevated since the 2022 energy crisis (McWilliams *et al* 2024).

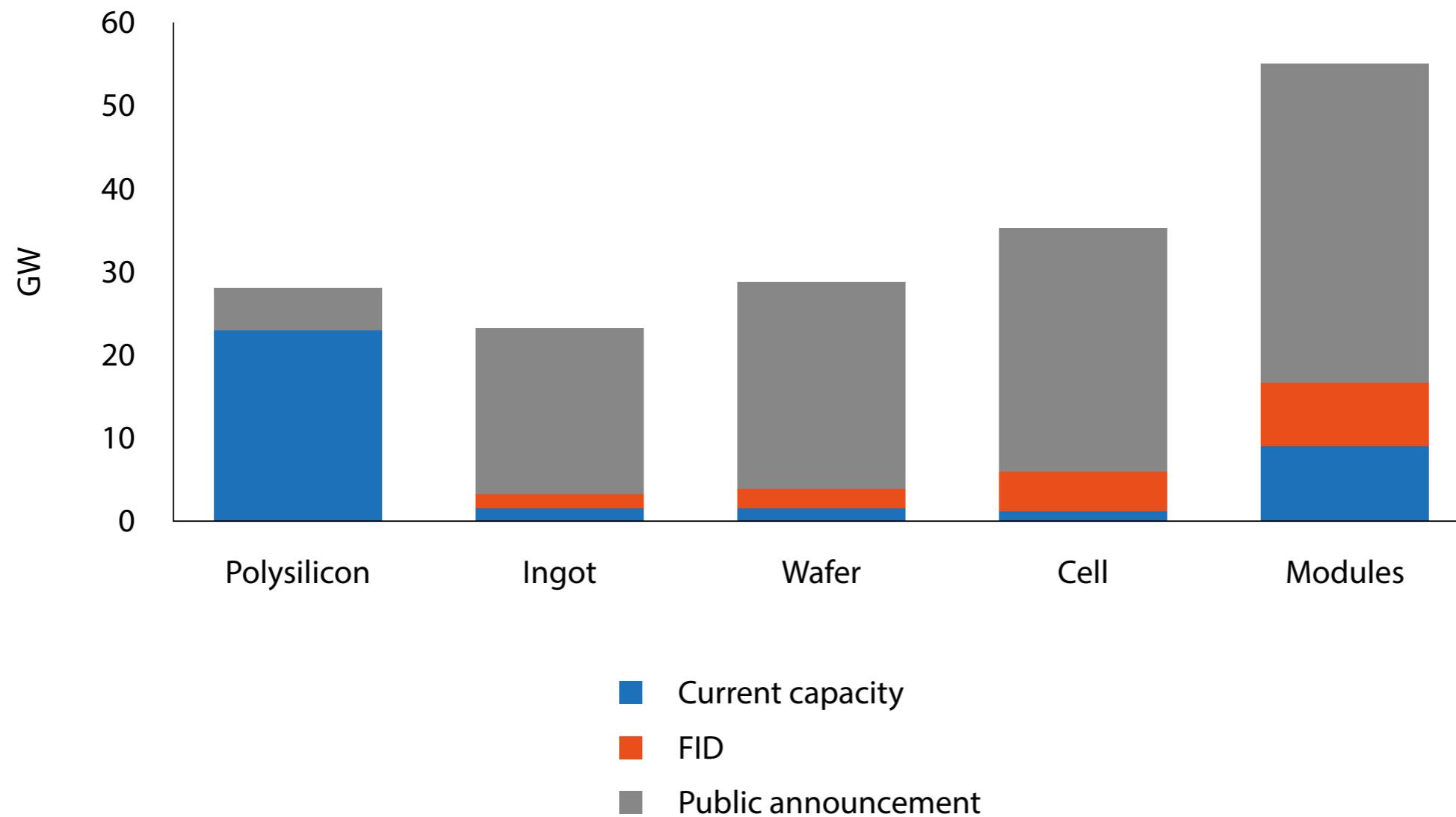
## 2.2 Solar PV manufacturing: the diverging trajectories of Europe and China

To understand the EU's lack of developed solar PV manufacturing, one needs to appreciate China's success.

China's solar PV industry emerged in the mid-1990s to address domestic needs, but rapidly became global. Chinese regions with favourable solar potential but limited access to other cheap and clean electricity sources started to look with interest at deployment of solar energy as a way to accelerate electrification (Zhang *et al* 2021). By 2003, China's solar energy installed capacity had soared to 45 MW, from 7 MW in 1995.

On the manufacturing side, foreign investment bolstered the sector's expansion. Chinese firms such as Suntech significantly boosted the sector's growth by raising funds through overseas IPOs. Notably, around 80 percent of China's solar panels were exported to the European market during this period (Cao and Groba, 2013), driven by the generous feed-in-tariffs provided by EU governments to accelerate the deployment of solar energy (Grau *et al* 2012).

**Figure 2. Solar manufacturing expansion in Europe up to 2026**



Note: capacities are estimated as of 2023. FID = final investment decision.

Source: Bruegel European Clean Tech Tracker (forthcoming).

China's export-oriented strategy resulted in significant advancements in production capacity and quality, along with substantial cost reductions. These developments played a key role in advancing the global rise of solar power. By 2008, the industry had experienced a tenfold increase in manufacturing capacity, establishing China as the global frontrunner in solar PV manufacturing (Zhang *et al* 2021).

The 2008 financial crisis led to a downturn in international demand for solar panels, compelling the Chinese government to pivot towards the domestic market. Massive solar energy deployment subsidies were rolled out, resulting in the production of solar PV cells increasing eight-fold between 2009 and 2011, while production of wafers grew tenfold and of polysilicon eighteen-fold (Zhang *et al* 2021).

These measures reduced manufacturing capacity costs and saw Chinese capacity grow at twice the global rate, solidifying its dominance in global solar PV manufacturing (Grau *et al* 2012). This rapid expansion resulted in significant oversupply worldwide, which together with a 70 percent drop in polysilicon prices<sup>8</sup>, led to drastically increased competition in the global solar PV market (Carvalho *et al* 2017).

This surge in cheap Chinese solar panels became an existential threat to European manufacturers, leading to a significant decline in some segments of Europe's PV industry. Many European solar panel manufacturers struggled to compete with the low-priced imports, resulting in closures and a reduction in market share.

In 2011, Solarworld (a major German manufacturer) and Prosun (at the time, the representative organisation of European solar-panel manufacturers), petitioned the European Commission for anti-dumping and anti-subsidy investigations into Chinese solar panels.

In 2012, the European Commission initiated a major investigation and determined that the appropriate value of a Chinese solar panel sold in Europe ought to be 88 percent higher than its then selling price<sup>9</sup>.

The Commission proposed the 'price undertaking' agreement<sup>10</sup>, under which Chinese companies were permitted to export solar products to the EU duty free up to an annual limit of 7 GW, provided the price stayed at or above €0.56 per watt.

Exports exceeding this quota or priced below the minimum threshold were subject to anti-dumping duties, intended to increase the selling price of Chinese panels in Europe by an average of 47 percent starting in August 2013.

China responded with anti-dumping and anti-subsidy investigations into EU wine imports but the EU measures were nevertheless renewed in 2015 and 2017, with the duties reduced to 30 percent and the minimum import price adjusted to align with global market rates.

Ultimately, in August 2018, the Commission removed the anti-dumping tariffs, considering it beneficial for the EU after evaluating the needs of producers against those of users and importers of solar panels<sup>11</sup>. This decision was influenced by the EU's goal of increasing the deployment of solar energy and by the reduction in the costs of solar components, which allowed import prices to align with world market prices.

Furthermore, the European industry did not gain any advantage from the reduced market presence of Chinese imports that resulted from the imposed measures. Instead, the EU's solar market share declined further, primarily because of increases in imports from countries in South Asia<sup>12</sup>.

And yet, every cloud has a silver lining. The competitive pressures, while forcing some Western firms out of the market, also spurred innovation among the remaining European companies, particularly those with a significant pre-existing base in innovation (Carvalho *et al* 2017; Bloom *et al* 2021).

Most importantly, the overall decrease in solar equipment costs, largely attributed to Chinese manufacturing, significantly lowered the levelised cost of energy<sup>13</sup> for solar PV, making it a formidable competitor to coal and gas in electricity generation (Carvalho *et al* 2017). In this context, the expansion of Chinese manufacturing had a positive impact on the solar sector at the global level (Andres, 2022; IEA, 2023a).

### 2.3 Europe's solar-panel dilemma: cost-efficiency vs geopolitical resilience

More than 90 percent of solar panels deployed in the EU are still imported from China, primarily because of their low price. In 2022, Chinese solar panels were estimated to be the cheapest in the world at \$0.26/watt (Woodhouse *et al* 2021).

Solar panels produced in Germany were approximately 40 percent more expensive, at \$0.38/watt. This disparity was largely driven by higher input costs, both in terms of energy (additional \$0.05/watt) and labour (additional \$0.04/watt).

Since then, a drop in polysilicon prices has further depressed the price of solar PV modules. In 2023, the price of Chinese solar panels dropped by over 40 percent, likely widening the price gap with the remaining European production. Bettoli *et al* (2022), prior to the surge in energy prices in Europe, estimated a \$0.09/watt gap between European manufacturers and 'leading industry cost levels'.

The difference was mainly driven by higher input costs in Europe (energy, labour and capital costs) and by lack of access to the critical raw materials needed for these technologies.

Since the price increases driven by supply-chain shortages between 2020 and 2022, module prices have crashed at record speed, reaching as low as \$0.15/watt in September 2023 (Figure 3). Meanwhile, the EU has dramatically increased imports of Chinese solar panels to an average of 9.5 GW per month in the first nine months of 2023. This compares to total deployment in the EU in 2022 of around 36 GW.

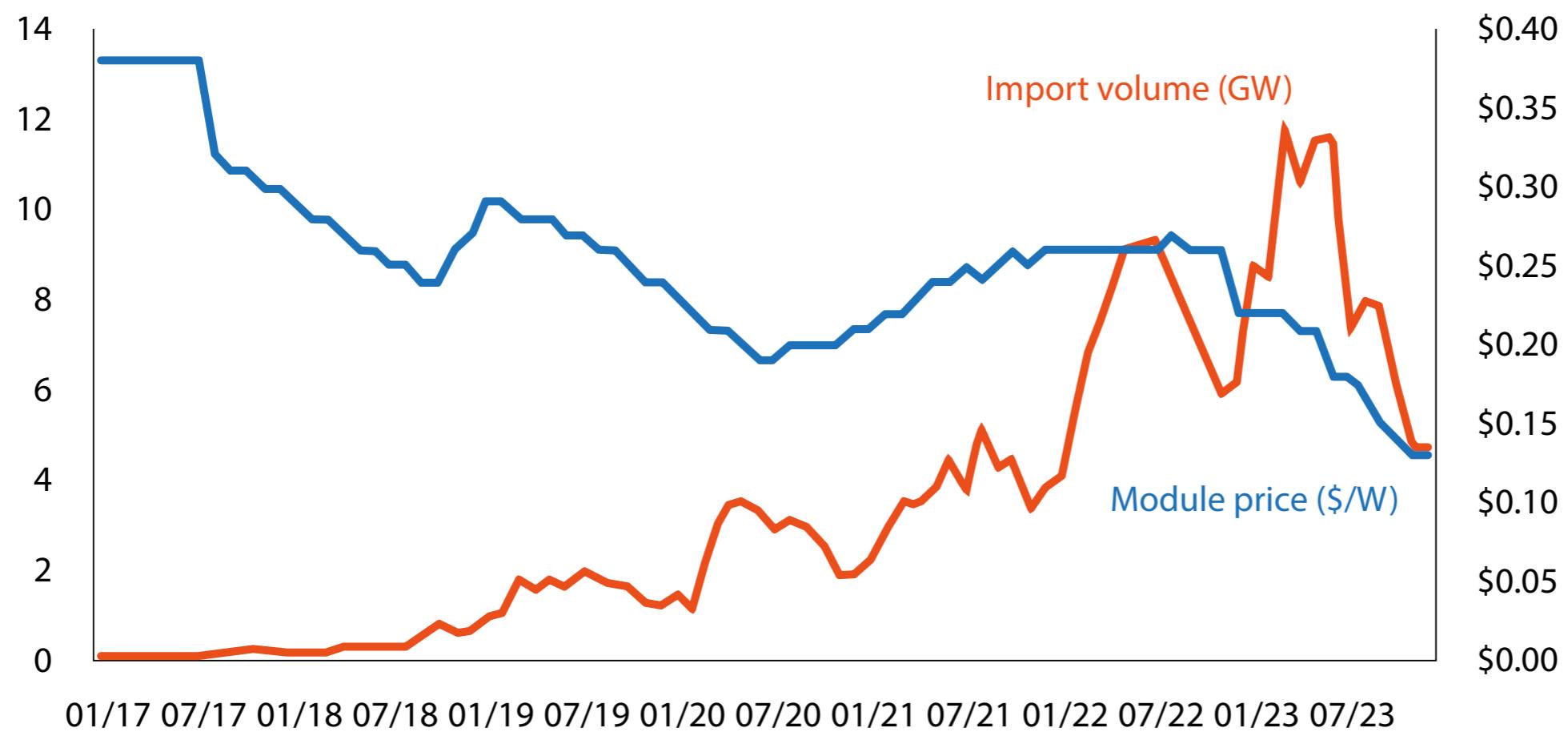
Attempts in the US to stimulate domestic solar PV manufacturing offer another perspective on this cost differential. Support under the US Inflation Reduction Act is estimated at between \$0.11 and \$0.18 per watt (Bettoli *et al* 2022), meaning that public support will closely match, and possibly exceed the total cost of producing a solar panel in China. The US has also implemented tariffs on the import of Chinese solar panels<sup>14</sup>, a step the EU has not taken so far.

For European solar PV manufacturers the current situation is a *deja-vu*, as competing with their Chinese counterparts has once again become extremely difficult. The examples of Norwegian Crystals and Norsun, ingot and wafer producers respectively, illustrate the challenge.

In August 2023, Norwegian Crystals filed for insolvency<sup>15</sup>, while the following month Norsun announced a temporary wafer-production suspension because of an oversupply of low-priced Chinese modules causing inventory buildup and disruption in the value chain<sup>16</sup>.

In January 2024, the European Solar Manufacturing Council wrote to the European Commission asking for emergency measures<sup>17</sup>. The Council wrote that around half of the EU's module assembly capacity was at risk of shutting down.

**Figure 3. EU imports of Chinese solar panels, volume (GW) and price (\$/watt)**



Source: Bruegel based on Ember dataset of Chinese solar PV exports.

Under current market conditions, European producers can hardly compete with their Chinese counterparts. Solar producer industry groups have called for anti-dumping measures against Chinese solar panels<sup>18</sup> and for additional trade measures to prevent solar panels produced with forced labour from entering the EU market (ESMC, 2023). The ghost of the 2013 tariffs on Chinese solar modules is looming again.

However, calls from European solar PV manufacturers for trade measures against Chinese panels are in stark contrast to what importers and installers of solar panels want. They warn the European Commission against initiating a trade defence investigation that could lead to the imposition of tariffs on Chinese solar PV products<sup>19</sup>.

The primary concern of these European companies is that implementing trade barriers on Chinese products would limit their access to essential, high-quality and affordable components necessary for the EU's solar-power value chains.

This is particularly crucial given the EU's limited domestic solar-panel manufacturing capacity. Imposing tariffs on Chinese solar products, they fear, could severely restrict the entire EU solar-power market.

These two contrasting positions illustrate Europe's dilemma when it comes to solar PV manufacturing: how to strike the right balance between economic efficiency and geopolitical resilience, without slowing-down the green transition. In response, a reflection is needed on the reasons why the EU should or should not support domestic solar PV manufacturing in the first place.

### **3 Evaluating Europe's case for solar manufacturing industrial policy**

The current political consensus in Europe favours the approach under the Net-Zero Industry Act (see section 1) – that the EU should increase domestic manufacturing for solar and other technologies, setting an indicative benchmark to get close to or achieve a 40 percent share of deployment covered by domestic production.

This suggests, in part at least, an import-substitution strategy that marks a break with traditional European thinking rooted in principles of free trade and markets. A clear economic rationale is necessary to justify this shift.

### 3.1 Scoring solar against economic intervention criteria

Industrial policy involves government efforts to change the structure of an economy, by encouraging resources to move into sectors deemed desirable for future development, in a way that would otherwise not be driven by market forces alone (Meckling, 2021).

We consider there to be three reasons why the EU might want to support domestic manufacturing of clean technologies: 1) facilitating decarbonisation; 2) fostering green growth and creation of green jobs; 3) boosting geopolitical resilience (or strategic autonomy) in sectors considered to be important for the EU economy.

In the case of solar panels, there is no strong economic case for EU support for the first two justifications, and at best a weak case for the third.

First, the EU does not need domestic solar PV manufacturing to accelerate its decarbonisation. The global solar PV market is vastly oversupplied, and the EU is currently importing twice the volume of solar panels it manages to deploy<sup>20</sup>, creating a stockpile equivalent to well over one year's annual deployment.

All indicators point to a further increase in this over-capacity, as Chinese companies expand aggressively, countries including the US and India ramp up their policy support to domestic manufacturing.

Overall, announced solar PV manufacturing expansion suggests that global capacity will double to over 1,000 GW by 2024-25 (Buckley and Dong, 2023), with China expected to maintain its 80 percent to 95 percent share of global

supply chains (IEA, 2024). In 2023, global capacity ranged between 800 GW and 1,200 GW for different value-chain stages (IEA, 2023b).

Meanwhile, the IEA has calculated that the world should achieve annual installations of 650 GW solar by 2030 to be on track for net zero by 2050 (IEA, 2021). The speed of EU decarbonisation will continue to be defined by its capacity to speed-up deployment rather than by supply-side bottlenecks.

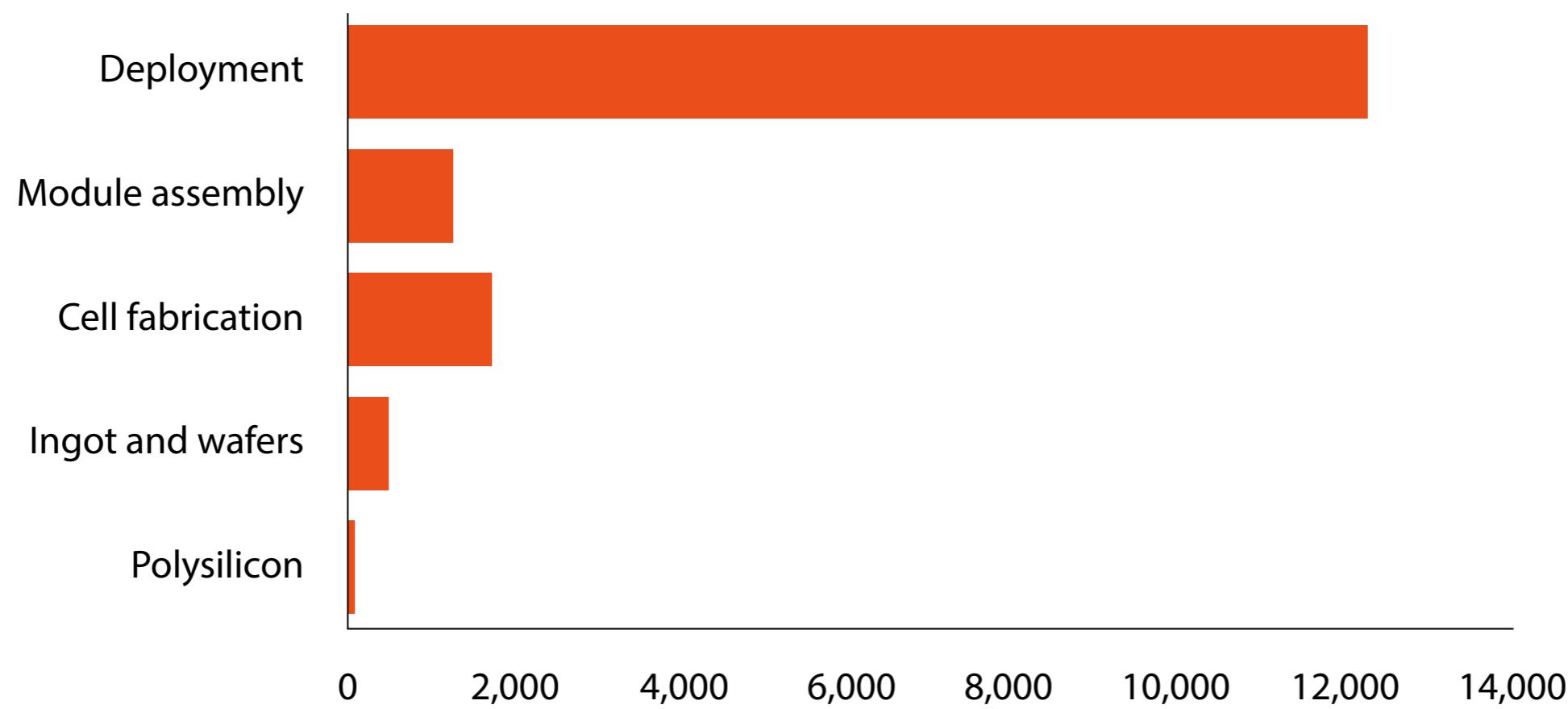
Second, the EU should not expect solar PV manufacturing to foster job creation and economic growth. In fact, the opposite might be true. Figure 4 shows that most solar-related jobs are in deployment rather than manufacturing. Solar PV manufacturing is not as job-intensive as deployment.

To create jobs in this sector, the EU would thus better focus on accelerating the deployment of solar energy. Imposing trade restrictions on Chinese solar panels would lead to higher costs, slowing deployment of panels and, possibly, a net-negative job effect. That would occur if more jobs were lost from a slowing of deployment than new jobs were created in possible new manufacturing facilities.

When it comes to economic growth, it is difficult to expect solar PV manufacturing to provide a major contribution, given that the EU has no comparative advantage in producing the existing generation of solar panels, and it is not clear where any unrealised advantage might lie.

This leaves the third reason – resilience – as the only possible justification for supporting domestic manufacturing. The EU is fully dependent on China for solar panels and at least two conventional risks are associated with this.

**Figure 4. Full-time equivalent jobs per 1 GW solar PV manufacturing or installation capacity**



Source: Bruegel based on Ignaciuk (2023).

The first is the economic risk that China might in the future make use of its predominant position in global solar PV manufacturing to distort the market and artificially obtain additional economic rents.

The second is the geopolitical risk that China might restrict solar-panel exports to certain countries to pursue geopolitical goals. The extent of both risks is unclear today.

### 3.2 The 'China risk'

There is no evidence that China currently abuses its solar manufacturing market power to artificially extract economic rent. The solar market is vastly over-supplied, and historically profit margins have been tight and even negative.

It is currently more likely that the Chinese state provides an artificial advantage to domestic producers through, for example, cheap land and loans, allowing them to export at lower prices<sup>21</sup>.

Were China to begin extracting rents from solar exports, the competitiveness position of non-Chinese producers would improve, encouraging a gradual growth in manufacturing capacity elsewhere. An even more dramatic risk would be if there were a sudden interruption of all exports of Chinese solar panels, for whatever reasons.

Consider, for instance, a scenario in which the EU reaches a decision on forced labour in China and decides to ban associated imports of certain products, including solar panels<sup>22</sup>. Or consider a scenario in which China deliberately restricts the solar panel exports to Europe as a result of flaring geopolitical tensions.

Comparisons with the cut-off of Russian gas to Europe are far-fetched. While the Russian gas disruption created significant and immediate issues because of the need to heat homes and run power plants, an interruption in

the supply of a manufactured goods like a solar panel is different. It would lead to a delay in the deployment of new solar panels, but would not affect the functioning of those already installed.

To measure the impact of such an event, one would have to estimate the resulting delay in European deployment of solar panels. This is understood as the time period between the end of Chinese supply and coming online of new supply.

In Figure 5, manufacturing lead times for different stages of the value chain are estimated at between one and four years. These might be expedited in the extreme case of a sudden disruption, much like Europe was able to accelerate the deployment of liquified natural gas infrastructure following the Russian invasion of Ukraine.

## **4 Resilience priorities for solar policy**

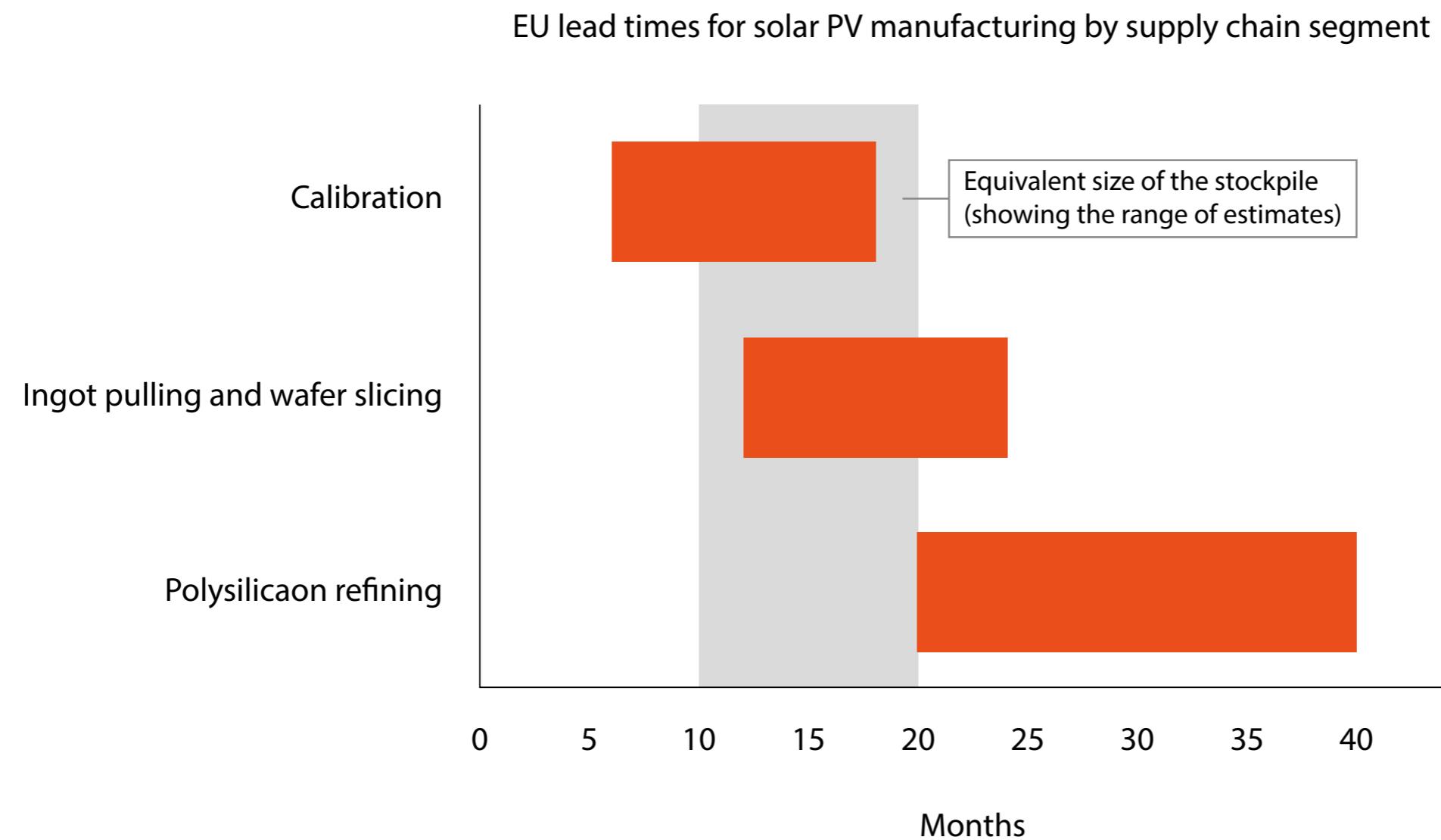
### **4.1 Stockpiling as a buffer solution**

European companies already have a stockpile of an estimated 40 GW of solar panels<sup>23</sup>, equivalent to almost one year of total EU deployment (section 3.1). The resilience benefit of a stockpile is that it provides breathing space for industry to respond in case of a sudden event that disrupts imports while continuing business-as-usual deployment.

Figure 5 shows the size of the current stockpile in terms of current monthly installations, and the estimated time it would take to build new factories for key components of the solar value chain.

The figure shows that if all imports were ended tomorrow, the EU could develop its own manufacturing capacities, while running down its stockpile to continue current deployment rates, facing disruptions counted in months, not years.

## Figure 5. The EU's solar buffer



Notes: The figure shows the size of stockpile in months' worth of deployment and the months needed to build new facilities.

Source: Bruegel based on IEA (2022).

If policymakers deem the risks of an immediate disruption to imports sufficiently high, the EU might explore more formal stockpiling arrangements to ensure supply-chain reliability. For example, it could require major importers to maintain a stockpile equivalent to three months (or more) of current import levels.

Frequent turnover of the stockpile should ensure that only the latest technology of panel is maintained. As global supply is diversified, this requirement can gradually be replaced by a requirement to demonstrate import resilience in case of disruption to a main supplier.

Stockpiling is a tried-and-tested approach, in line with current IEA recommendations for oil imports, which are substantially more important for economic security. Countries must maintain oil reserves equivalent to a minimum of 90 days' worth of net oil imports<sup>24</sup>.

A solar stockpile is a relatively cheap tool for addressing import concern risks. A rough estimate is that the costs of storing 20 GW solar panels would be from €400 million to €550 million annually<sup>25</sup>. That is around 10 percent of the total value of the panels at current prices (around €4 billion). By comparison, to provide these same 20 GW of supply, estimates based on US Inflation Reduction Act subsidy rates suggest a cost of around €2 billion annually in subsidies offered for the first years of a plant's operation<sup>26</sup>.

While the EU might offer substantially lower subsidies than the US, they will still far exceed the costs of storing panels. From a short-term resilience perspective, stockpiling is cheaper.

#### 4.2 Accelerating solar deployment

Accelerating the deployment of solar panels should be a much higher economic-security priority for Europe than developing its own manufacturing capabilities. This is because reliance on imported fossil fuels poses a greater threat to Europe's economic security than reliance on imported solar panels.

Solar deployment is accelerating, with 56 GW installed in 2023 (SolarPower Europe, 2023), exceeding the annual installation of 54 GW needed to meet EU energy targets<sup>27</sup>. A combination of steadily decreasing solar costs and increased policy attention is driving this growth.

The European Commission has described the deployment of solar energy as the ‘kingpin’ of efforts to end dependency on Russian fossil fuels. Governments are encouraged to create ‘go-to areas’ where permitting is accelerated for renewable projects to hasten deployment (European Commission, 2022).

With no shortage of supply, policy efforts should be most concerned with guaranteeing and possibly exceeding current targets. This requires a continued focus on permitting and grid connection. Developers are ready to build, but they need permission from agencies and they need destinations for all the generated power.

In the coming years, this challenge will intensify as optimal locations become utilised. Grids will also face increasing pressure from large volumes of electricity generation aligned with periods of sunlight.

#### 4.3 Gradual import diversification

The NZIA benchmark of meeting, or getting close to, a certain proportion of deployment needs with domestic manufacturing disregards the costs of promoting self-sufficiency compared to the use of cheaper imports (Tagliapietra *et al* 2023a).

Regrettably, no impact assessment has been performed to evaluate whether disrupting imports of solar panels would harm or improve overall EU energy and economic security. Economic resilience is hampered more by a high concentration of imports rather than high overall import volumes (Welslau and Zachmann, 2023).

It will be difficult to immediately diversify imports given Chinese dominance; however, in the second half of this decade it will likely become easier as heavily subsidised supply will come online in the US.

The EU might also act by supporting those countries with a comparative advantage (eg. potential for cheap electricity), but which need to develop their manufacturing capacities (BloombergNEF, 2021). The EU's Global Gateway initiative to support green and digital infrastructure development in partner countries<sup>28</sup> could serve as a strategic tool in this respect.

With investment commitments of up to €300 billion by 2027, this initiative is geared towards establishing sustainable and resilient supply chains across various sectors, including ensuring access to critical raw materials essential for solar PV technologies.

Its main regional focus is on Africa, where the EU has already pledged a significant investment of €150 billion with the Africa-Europe Investment Package.

## **5 Innovation, rather than European content, should justify manufacturing subsidies**

### **5.1 Risks of intervention justified by domestic content**

The notion of economic resilience as a justification for solar PV manufacturing subsidies is questionable, but clearly drives current European public discourse on the issue.

For example, the NZIA foresees resilience criteria in public procurement, meaning that governments can explicitly penalise bids from outside of Europe by providing additional subsidies to bids that prove European content.

This would bring with it two risks. First, given that European producers are currently highly uncompetitive compared to their Chinese counterparts, any policy that limits the ability of foreign competition will increase solar panel prices. The effect is likely to be slower solar PV deployment and slower decarbonisation.

Second, such a policy risks creating an industry that is completely dependent on subsidies. There is no guarantee that European solar manufacturing will be competitive with foreign competition once subsidies expire.

This is especially the case with the current generation of solar panels, on which Chinese companies benefit from huge economies of scale. Instead, Europe must focus on innovation and developing the next generation of solar PV if it is to stand any chance of growing some market share.

### 5.2 Support innovation in manufacturing

The manufacture of solar cells is a fast-moving sector, in which innovation drives substantial change and there is still plenty of space for further innovation. Companies that lead and commercialise such innovation may be able to carve out market shares in future solar products.

The best chance for Europe to develop some solar leadership is to support innovation and the commercialisation of emerging solar technologies, including new semiconducting technologies such as perovskite (Box 2). The EU has an established tool for supporting early-stage innovation: the Innovation Fund. This fund receives its revenues from the EU emissions trading system, and its size is expressed in terms of permits.

Therefore, the recent rise in the price of permits from close to €20 per tonne of emissions to above €60 per tonne (reaching above €100 in early 2023) resulted in a substantial expansion of spending capacity. Part of this surge can be channelled toward new solar technologies.

## Box 2. Innovation in solar cells

A solar cell contains a semiconductor material that transforms light energy into electrical energy. Innovations focus on how to enhance the efficiency of this transformation, and on reducing the cost and energy requirements of solar panel manufacture. Around 95 percent of today's solar panels use cells with a silicon-based semiconductor material. Typical innovations include adding layers of material to the cell to improve the absorption and conversion of light energy.

For instance, a major ongoing industry shift is toward TOPCon cells, in which an additional insulating layer enhances electrical conductivity. An advantage of TOPCon cells is that they essentially rely on the current manufacturing supply chain.

Silicon-based solar cells installed on houses are based on single-junction architecture, with one layer of semiconducting material. For applications involving space travel, multi-junction cells are used instead: these have multiple layers of semiconducting material, improving efficiency but at a much higher cost. A major challenge for the manufacturing process is to reduce these costs to make them commercially viable for use on Earth.

A perhaps more radical innovation is the use of new semiconductor material, such as perovskite. A range of layers including plastics, metals and glass can be coated with this crystal-based material. A current industry focus is to combine a layer of perovskite material with a silicon-based cell (known as a tandem cell). This has the potential to substantially improve efficiencies as its production requires much less energy than crystalline silicon PV cells. The technology is not yet commercialised, but Oxford PV aims to bring its manufacturing plant in Berlin soon online. Alternative cell designs include 'thin film' such as cadmium telluride. These cells are made by depositing thin layers of semiconductor material onto a base layer. First Solar runs an integrated thin-film facility in the US serving about 15 percent of the overall domestic solar market.

Several facilities currently under construction have received funding from the Innovation Fund. Projects are evaluated against five criteria: 1) effectiveness of reducing greenhouse-gas emissions, 2) degree of innovation, 3) project maturity, 4) replicability, and 5) cost efficiency.

Funding involves a competitive process against other clean technologies with the idea of ensuring that European public money is targeted to the most promising projects. The approach contrasts with that taken under the US Inflation Reduction Act, which allows all projects meeting broader criteria apply for tax credits. The EU approach maximises the chance that supported projects contribute to sustainable economic growth.

Other EU-level instruments also support early-stage innovation in clean technologies. The Horizon Europe research programme spearheads the EU's commitment to innovation with a €95.5 billion budget, emphasising climate and sustainability.

It includes the European Research Council (ERC) and the European Innovation Council (EIC) to nurture early-stage innovation. The ERC will allocate over €16 billion from 2021-2027 to pioneering research projects, while the EIC, with a €10.1 billion fund, offers startups and smaller companies financial backing through grants and equity, focusing on clean energy and smart technologies.

The European Institute of Innovation and Technology (EIT), supported by a €2.9 billion Horizon Europe budget, cultivates cross-sector partnerships for global challenges, with a significant portion dedicated to green industrial policy.

Reinforcing the EU's innovation ecosystem, the European Investment Bank (EIB) supports investments in clean energy, efficiency and renewables. In 2022, the EIB allocated €17.5 billion to transport and industrial sectors, with

€3.3 billion targeting clean technology projects and €10.4 billion for energy projects, including €4.4 billion for renewable energy.

Finally, InvestEU, an EU initiative to stimulate private investment in innovation and the green transition<sup>29</sup>, has a €26.1 billion EU budget guarantee to stimulate private investment in strategic areas, including sustainable infrastructure and innovation (Tagliapietra *et al* 2023b).

European subsidies are less successful at growing new technologies from demonstration to commercial status (McWilliams and Zachmann, 2021). This is a problem as the cost of financing is higher for emerging technologies and often is not provided by the market.

Public support for the commercial growth of technologies that offer a radical advantage over the current generation of solar panels is more likely to lead to the development of economically sustainable industries in Europe.

Radically new technologies might enable a new start for a competitive, self-sustaining EU eco-system of cell manufacturing. Developing and bringing to scale next-generation panels could contribute to the goal of accelerating decarbonisation, within the EU, but, importantly, also beyond.

The deployment of much utility-scale solar PV across Europe is driven by government auctions or subsidies<sup>30</sup>. To stimulate innovation, governments might increase available subsidies if developers can demonstrate certain characteristics of the manufactured panels.

To further promote innovation, governments could offer enhanced subsidies or higher bid limits for developers that show their solar panels excel in, for example, peak efficiency, low-light performance, recyclability and energy input requirements.

Maximum bid prices or even separate auctions could be designed for developers who can prove the use of an innovative panel design. Similar criteria should drive any support offered by the EIB.

### 5.3 Support innovation in recycling

In the EU, solar recycling is a legal requirement under the Waste Electrical and Electronic Equipment Directive<sup>31</sup>. The directive sets minimum waste collection and recovery targets for different product categories. Solar panels are in a category of electronic waste with a target set at 85 percent for recovery and 80 percent for reuse and recycling.

Producers of solar PV panels are responsible for the disposal and recycling of the modules they sell in the EU. A scheme financed by panel manufacturers and importers funds the collection of end-of-life panels, with pilot recycling lines in certain countries.

Effective recycling reduces reliance on imported materials. The EU can play a role in scaling up this industry by expanding funding and support mechanisms. Initiatives such as those under Horizon Europe<sup>32</sup> and EIT RawMaterials Innovation Hub Central & West<sup>33</sup> are paving the way.

## 6 Conclusions

The approach under the NZIA of setting an indicative benchmark of about 40 percent for home production of different technologies raises significant concerns, which solar panels make plain. Supporting solar manufacturing

### **Box 3. Recycling of end-of-life solar panels**

The most widespread solar-panel recycling technology recovers only the aluminium frame, copper-containing junction box and sometimes the front glass panel. The central technical hurdle is the high-purity separation of encapsulated materials, which is vital for the economic viability of the recycling process (Granata *et al* 2022).

The value of recovered materials varies, with silver, copper, silicon and tin being the most lucrative, particularly silver, which, despite its lower concentration, is valued 500 to 800 times more than tin and copper, making it a prime target for recycling. Silver content and processing volumes are key to the profitability of PV recycling: for panels with high silver concentration (0.2 percent), recycling is economically viable without fees at volumes above 18,000 tonnes per year; below this threshold, fees are necessary to cover up to 46 percent of costs (Granata *et al* 2022). Panels with only 0.05 percent silver require fees for profitability, unless processed volumes exceed 43,000 tonnes annually. Optimal returns on investment are tied to both the timing of investment and silver-market prices, with the best outcomes predicted for early investments at higher silver prices and substantial processing volumes.

Emerging recycling technologies aim to refine the separation process and enhance the recovery of glass, silicon and metals. These technologies can be generally divided into physical, thermal and chemical methods (Pereira *et al* 2023). Among these, the Advanced Photolife Process stands out, claiming over 80 percent material recovery through a combination of physical, thermal and chemical methods (Granata *et al* 2022).

purely for the sake of being European does not present clear advantages in terms of accelerated decarbonisation or increased economic growth.

Nor is the political focus on increasing economic resilience in this sector a valid justification for committing substantial public resources. Instead, more efficient strategies should be employed. Measures including accelerating solar deployment, stockpiling to ensure a buffer in a worst-case scenario and diversifying import sources offer more pragmatic approaches to mitigate threats to European economic security arising from solar PV imports. Manufacturing subsidies for the solar industry should prize innovation only. This criterion would ensure that funding would be directed toward technologies that offer genuine economic and climate benefits.

Finally, while a general over-reliance on imports from one country can be considered dangerous, the case of solar panels emphasises that an obsession with addressing this risk at individual product level is myopic. For the existing generation of mass-manufactured, energy-intensive solar panels, Europe will struggle to reclaim Chinese market share, and the case for trying is not well justified.

Europe can strengthen its economic resilience relative to China with an industrial policy that intervenes in sectors with greater potential to contribute to sustainable economic growth and alleviate decarbonisation bottlenecks. Examples include the manufacture of wind turbines or exploiting Europe's labour force and brand recognition for electric vehicles. Such an approach better leverages existing strengths and can contribute more effectively to the global push for clean energy. ■

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## Endnotes

1. The EU currently has 110 GW coal-fired capacity, 180 GW natural gas fired capacity, and 105 GW nuclear capacity. Average hourly demand in 2022 was 320 GW.
2. See [SolarPower Europe](#) press release of 12 December 2023, 'New report: EU solar reaches record heights of 56 GW in 2023 but warns of clouds on the horizon'.
3. See [Eurostat](#) press release of 8 November 2023, '[International trade in products related to green energy](#)'.
4. Agreement on the NZIA on 6 February 2024 requires ratification by the European Parliament and Council of the EU. See [Council of the EU](#) press release of 6 February 2024, '[Net-Zero Industry Act: Council and Parliament strike a deal to boost EU's green industry](#)'.
5. Ivan Penn and Ana Swanson, '[Solar Company Says Audit Finds Forced Labor in Malaysian Factory](#)', *The New York Times*, 15 August 2023.
6. Sandra Enkhardt, '[European solar manufacturers demand EU support](#)', *PV Magazine*, 12 September 2023.
7. We discuss here the silicon manufacturing route, which is by far the most common today. Innovation in the sector may also see development of new supply chain routes, which we discuss in section 5.
8. Usha CV Haley and George T Haley, '[How Chinese Subsidies Changed the World](#)', *Harvard Business Review*, 25 April 2013.
9. See European Commission memo of 4 June 2013, '[EU imposes provisional anti-dumping duties on Chinese solar panels](#)'.
10. See European Commission press release of 2 December 2013, '[EU imposes definitive measures on Chinese solar panels, confirms undertaking with Chinese solar panel exporters](#)'.
11. Jorge Valero, '[Commission scraps tariffs on Chinese solar panels](#)', *Euractiv*, 31 August 2018.
12. See answer given by the European Commission to a European Parliament question on '[End of anti-dumping measures on imports of solar panels from China](#)', 27 October 2018.
13. Levelised cost of energy (LCOE) refers to a calculation of the average cost per unit of electricity generated by a particular energy source, such as solar PV, over its operational lifetime. It takes into account all the costs associated with

the energy system – initial investment, operations, maintenance, the cost of fuel and the system's expected lifetime. The LCOE enables comparison of different energy technologies on a consistent basis. In this context, 'LCOE for solar PV' refers to the cost of generating electricity using solar PV technology.

14. See US Department of Commerce press release of 18 August 2023, '[Department of Commerce Issues Final Determination of Circumvention Inquiries of Solar Cells and Modules from China](#)'.
15. Marco de Jonge Baas, '[Noorse waferfabrikant Norwegian Crystals failliet](#)', Solar Magazine, 29 August 2023.
16. Valerie Thompson, '[Norsun announces temporary wafer production halt, layoffs](#)', PV Magazine, 8 September 2023.
17. Kate Abnett, '[Europe's solar panel manufacturers ask EU for emergency support](#)', Reuters, 30 January 2024.
18. Henning Jauernig, Benedikt Müller-Arnold, Stefan Schultz und Gerald Traufetter, '[Der deutsche Solarboom hängt an Chinas Tropf – kann das gut gehen?](#)' Der Spiegel, 27 October 2023.
19. Trade measures would "would injure the EU solar sector to the detriment of the EU's own green energy transition at a critical moment in time". See [SolarPower Europe statement](#) of 29 November 2023.
20. See Rystad Energy press release of 20 July 2023, '[Europe hoarding Chinese solar panels as imports outpace installations; €7 billion sitting in warehouses](#)'.
21. This is exactly what the EU is currently investigating Chinese electric vehicles for. An anti-dumping investigation is seeking to determine whether the Chinese state provides excessive support for automobile exports, leading to unfair competition with EU products. See European Commission press release of 4 October 2023, '[Commission launches investigation on subsidised electric cars from China](#)'.
22. The suspension of the EU-China Comprehensive Agreement on Investment (CAI) serves as a pertinent example of how concerns over forced labour can impact trade flows between the two countries. The CAI negotiations, which started in 2014 and concluded in December 2020, faced significant challenges because of concerns over forced labour, particularly in Xinjiang. Following EU sanctions against Chinese officials for human-rights violations, China imposed retaliatory sanctions on EU entities and officials. In May 2021, the European Parliament voted to suspend the ratification of the CAI, as long as China's sanctions remain in place.

23. Much uncertainty surrounds this number. S&P Global reported industry estimates at 45 GW in August 2023; see Camilla Naschert, '[Glut of inexpensive solar panels in Europe boosts project economics](#)', S&P Global, 21 August 2023. Rystad Energy made multiple estimates in 2023, ranging between 40 GW and 80 GW.
24. See IEA website: <https://www.iea.org/reports/oil-security-policy>.
25. 20 GW is an upper-bound estimate for three months EU deployment. The authors assume a typical solar panel of 1.5 square metres and 300 W capacity. They assume that the cost of storage is €50 per square metre, insurance costs are 1 percent of the value of stored panels, and overhead costs at 20 percent of storage and insurance cost. Finally, it is assumed that solar panels can be stacked 15 rows high in a warehouse. For estimates of the storage cost in Europe, see <https://ecommercenews.eu/warehouse-storage/> and <https://www.statista.com/statistics/527840/warehouse-primary-rent-cost-logistics-market-france-europe/>.
26. With a subsidy rate of €0.10 per watt.
27. The EU Solar Strategy cites required 45 GW capacity, but this is given in AC terms. Assuming a conversion factor of 1.2 to account for the DC conversion, this figure translates to approximately 54 GW in DC terms.
28. See European Commission Global Gateway [webpage](#).
29. See [https://investeu.europa.eu/index\\_en](https://investeu.europa.eu/index_en).
30. See IEA, <https://www.iea.org/data-and-statistics/charts/europe-solar-and-wind-forecast-by-policy-and-procurement-type-2023-2024>.
31. See the European Commission Waste from Electrical and Electronic Equipment (WEEE) [webpage](#).
32. See European Commission CORDIS [webpage](#).
33. See EIT RawMaterials [webpage](#).

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# Entry and competition in mobile app stores



The EU's Digital Markets Act opens up the possibility of increased innovation in app stores on mobile devices. Fiona Scott Morton examines the exciting potential benefits

**E**ntry by rival app stores on the two currently available mobile operating systems is an exciting potential benefit of the European Union's Digital Markets Act (DMA). Apple and Google will need to share the technical specifications of their interfaces with developers and offer them the same functionalities they give to their own stores.

The DMA also allows developers to disintermediate the legacy stores entirely by mandating downloads from the web to handsets. These changes should stimulate price competition – resulting in fees falling from the current 30 percent – and competition in variety and features.

Privacy and security will be important issues, with the question of who is permitted to offer rival stores being critical. Good enforcement by the European Commission will be necessary to balance gatekeeper rules restricting dangerous services with the need for contestability.

The paper concludes with examples of rival app stores that can be expected to enter. Stores will differentiate through curation, such as stores for children, for those trying to reduce their carbon footprints or for those seeking to use public services in a particular country.

Some stores will innovate through alternative payment schemes – for example, a newspaper store that enables per-article pricing and pioneers innovative data-sharing policies. Lastly, developers such as Epic have long stated their desire to offer stores with innovative technology.

## 1 Introduction

On 25 January 2024, Apple said it would introduce new rules for its Apple App Store in Europe, including charging lower rates for in-app purchases, adding new fee of €0.50 per app download and a method to authorise rival stores<sup>1</sup>.

These dramatic changes are in response to the European Union's Digital Markets Act (Regulation (EU) 2022/1925), which opens up the possibility of increased innovation in app stores on mobile devices. But, as always, innovation and the attendant benefit to consumers will only happen if the regulation is enforced well.

*It is prudent for gatekeepers to start engaging with entrants before the deadline so that the interface they offer in March functions correctly and has proportionate entry criteria*

Today, Apple's App Store is the only app store for the iPhone. On Google Android handsets there is one mandatory app store, Google Play, and limited ability for others to enter<sup>2</sup>. The result is that more than 95 percent of Google Android downloads are through Google Play (Northern District of California, 2021a).

Because users typically single-home on a handset, the result is a duopoly mobile operating system market featuring monopoly app stores. These monopolies offer a one-size-fits-all curation and poor quality, with inaccurate search results, ads cluttering the experience and malware in the store.

Unlike app stores, stores that consumers patronise in both non-digital and other digital contexts are differentiated; they vary in business models, their curation is targeted to satisfy the needs of distinct groups, and/or they make different trade-offs between price and quality.

Furthermore, they must provide a good experience if they want to keep their consumers. The DMA increases contestability so that these beneficial aspects of competitive markets can apply to app stores.

Today, the gatekeeper app store is the only route by which a developer can reach a user of an iOS handset (the operating system used for mobile devices which are manufactured by iPhone), and almost the only route available to distribute to a Google Android handset.

Gatekeeper app stores set rules for developer access to the store; these include security requirements, functionality tests, rules concerning communication with end users and usage fees. These fees are paid by the app developer (business user) when it sells an app in the store or sells any digital content consumed through the app. This is distinct from a service purchased in the app but consumed outside, such as airline tickets. The advertised rate charged by both app stores is 30 percent of the revenue earned by the app developer.

The 30 percent level has no cost basis provided by either gatekeeper; legend has it that the 30 percent was chosen by Steve Jobs as the original commission Apple took on every \$0.99 song it sold (passing on \$0.72 to major labels and \$0.62 to independent labels)<sup>3</sup>. Many business users – for example, Spotify – do not sell their content on mobile platforms because of the size of the fee<sup>4</sup>.

Recent market, regulatory and antitrust pressure on the 30 percent fee has caused both stores to create exceptions that can qualify developers to pay lower rates. During the pandemic, both gatekeepers lowered their fees to 15 percent on the first \$1 million in revenues by a developer and this lower rate is also charged on subscriptions after the first year<sup>5</sup>.

Larger developers bargain with the gatekeepers, perhaps agreeing to distribute exclusivity through Google Play in exchange for reduced fees. It was revealed during the Epic versus Google trial that Spotify negotiated a 4 percent commission with the Google Play store to continue selling its content there<sup>6</sup>.

Both app stores will only distribute apps that have passed the platform's app authorisation process. This process involves verifying that the app functions as advertised, does not contain illegal, defamatory, discriminatory, or other objectionable content, includes safeguards against users posting such content and adheres to data privacy and security guidelines<sup>7</sup>.

For example, the store will reject an app that uses proprietary APIs that reach far down into the operating system to gather private data<sup>8</sup>. Currently both mobile ecosystems spend considerable effort on the app approval process because a significant part of the value of the handset to users comes from the app ecosystem.

Apple requires developers to enrol in the Apple Developer Program to be able to publish an app. This membership costs \$99 per membership year<sup>9</sup>. Google has a similar programme which costs \$25 per year<sup>10</sup>.

In 2022, the Apple App Store rejected 1.7 million apps, which is 27 percent of the 6.1 million apps it reviewed<sup>11</sup>. Google similarly disallowed 1.43 million apps in 2022<sup>12</sup>. Forty percent of Apple's app rejections have to do with 'completeness' (bugs, broken links, incomplete information etc) but apps are also rejected for misleading users or for having unclear data access requests<sup>13</sup>. Developers whose apps are rejected may use an appeals process.

Apple's team consists of 500 experts and review about 100,000 apps every week<sup>14</sup>. The review process at Google is considered less stringent than Apple's and relies more on automation than human reviewers<sup>15</sup>. Google recently announced that it plans to increase investment in the automated approach and recently launched a new 'real-time' app scanning system to combat malicious sideloaded apps<sup>16</sup>.

Developers now must also test their applications with a minimum of twenty people for at least two weeks before publication<sup>17</sup>. There are more security problems in Google's store than there are in Apple's<sup>18</sup>. For example, according to Kaspersky, an anti-virus software firm, there were 600 million malware downloads in 2023 on Android<sup>19</sup>.

While both Apple and Google claim they keep dangerous or illegal content out of their stores, it is interesting to observe that Apple has 1.8 million apps in its store while Google Play has 3.6 million, suggesting that some of the Google apps do not satisfy Apple's criteria. To the writer's knowledge there is no regulator that evaluates the quality and security of the gatekeeper app stores.

## **2 The DMA and app stores**

Because a monopoly app store is a bottleneck in getting services and content to single-homing end users, app stores are listed in the Digital Markets Act (DMA) as gatekeepers. The decision by the European Commission in

September 2023 designated both Apple's App Store and the Google Play Store as Core Platform Services that must comply with the rules in the Act.

The DMA contains at least seven rules that improve contestability and fairness in app stores. The profusion of rules designed to help app developers escape the control of the app store is notable. Many European-based app developers have been vocal about their lack of power relative to the American gatekeepers; the focus on app stores in the DMA may reflect this political economy. In addition to rules enabling entry of rival app stores, there are additional rules that permit apps to disintermediate app stores entirely.

Disintermediation occurs when the developer instructs the user to buy its content on the web through a browser but consumes that content on the handset. The ability for a developer to use a distribution route that is not the gatekeeper's app store, such as sideloading, is also mandated.

These disintermediation options will be particularly attractive to developers if the regulations allowing entry and competition fail to generate competitive prices and quality in app stores. App developers may also want to use their right under the DMA to seek fair, reasonable and non-discriminatory (FRAND) terms from the monopoly store if entry of rivals fails to materialise.

The DMA approach to app stores thus feels a bit like a 'belt and suspenders' strategy. Below is an explanation of these seven rules, edited lightly to retain only the portions relevant for app stores.

## 2.1 Contestability through Interoperability with the OS

In the DMA, the foundation of the entry right for rival app stores is Article 5(8) which prohibits tying between Core Platform Services.

*"The gatekeeper shall not require business users or end users to subscribe to, or register with, any further core platform services... as a condition for being able to use, access, sign up for or registering with any of that gatekeeper's core platform services..."*

This prohibits the gatekeeper from requiring the use of the gatekeeper's app store in order to use its operating system CPS.

The basic Article allowing the entry of rival app stores, permitting those stores to be a user's default and permitting sideloading, is DMA Art. 6(4):

*"The gatekeeper shall allow and technically enable the installation and effective use of third-party...software application stores...interoperating with...its operating system and allow those... software application stores to be accessed by means other than the relevant core platform services of that gatekeeper. The gatekeeper shall, where applicable, not prevent the downloaded third-party...software application stores from prompting end users to decide whether they want to set that downloaded...software application store as their default. The gatekeeper shall technically enable end users who decide to set that...software application store as their default to carry out that change easily."*

We see in the last sentence of Article 6(4) a nod towards dark patterns and the consumers who respond to them. The DMA repeatedly makes it clear that gatekeepers must comply in an effective way and not one that tries to preserve the status quo by tricking consumers.

It is one thing to mandate a store must be allowed, but another to ensure that the gatekeeper does not attempt to disadvantage those rival stores relative to its own. DMA Article 6(7) requires that rival stores have the same access

and functionality as the gatekeeper's own service and further specifies that a rival app store must get this access and functionality free of charge:

*"The gatekeeper shall allow providers of services, free of charge, effective interoperability with, and access for the purposes of interoperability to, the same hardware and software features accessed or controlled via the operating system as are available to services provided by the gatekeeper. Furthermore, the gatekeeper shall allow business users, free of charge, effective interoperability with, and access for the purposes of interoperability to, the same operating system, hardware or software features as are available to, or used by, that gatekeeper when providing such services."*

## 2.2 Contestability through disintermediation of the gatekeeper

DMA Article 5(4) explicitly permits an app developer to disintermediate the app store:

*"The gatekeeper shall allow business users, free of charge, to communicate and promote offers, including under different conditions, to end users acquired via its core platform service or through other channels and to conclude contracts with those end users, regardless of whether, for that purpose, they use the core platform services of the gatekeeper."*

To give a practical example, a social networking service could list its app in an app store where a user can discover it. Once opened, the app can say: 'Subscriptions are available for €9.99 at our website by clicking on this link here. You are welcome to subscribe through the app store for €12.99. This higher price includes the 30 percent fee charged by the Apple/Google store' (Sunderland *et al* 2020)<sup>20</sup>.

Under current rules, a developer is not permitted to provide information about lower prices or off-store purchase channels. The new rights would allow the social networking app in the example to pay no fees to the app store, though it would bear the cost of running its own website and processing payments there.

DMA Article 5(5) then explicitly permits the user who acquired the content for less outside the app store to consume it on the handset:

*"The gatekeeper shall allow end users to access and use, through its [App Store], content, subscriptions, features or other items, by using the [app] of a business user, including where those end users acquired such items from the relevant business user without using the [App Store] of the gatekeeper."*

In Apple's terminology this is known as a 'reader app.' Apps with significant brand recognition such as Netflix and Kindle have already been able to negotiate for and obtain a reader app. The DMA makes this facility universal. Continuing with the example above, the user who purchases outside the store for €9.99 can then download the social networking app, log in using the credentials established outside, then read and post content on the handset.

A major complaint from app developers has been the 30 percent commission charge by both Apple and Google for distribution through the app store. This commission has been enforced and automatically collected by requiring the use of the store's payment system and not one belonging to the app or some other third party. DMA Article 5(7) ends this tie and allows the developer to disintermediate the payment service:

*"The gatekeeper shall not require...business users to use...a payment service, or technical services that support the provision of payment services, such as payment systems for in-app purchases, of that [app store] in the context of services provided by the [app developer] using that gatekeeper's [app store]."*

The ability to use a different payment processing function could be an equilibrium choice or it could be a useful outside option for bargaining. The efficient choice for a developer will depend on the cost of running rival stores as well as the ability for users to discover apps in those stores. The law allows for a choice between selling on the web, distributing through a rival app store that collects payments under competitive terms, or staying in the gatekeeper's app store.

The law also requires that a developer be able to get onto the handset without going through the gatekeeper app store. Today this is known as sideloading. A user navigates to a web page using their browser and then clicks to download and install the app on their handset.

Sideloaded is not possible on iOS devices but is enabled on Google Android. The Google procedure, however, comes with a long series of alerts and checks warning the user of the danger of installing an unauthorised app on the handset. DMA Article 6(4) states that app stores must

*"allow those software applications or software application stores to be accessed by means other than the relevant core platform services of that gatekeeper."*

This rule is not specific as to what the alternative route must be and therefore some choice to the gatekeeper. As noted above, Google permits sideloading already. If Apple does not want to allow sideloading because of the security risk, it will have to develop an alternative.

If rival app stores were pre-installed on iOS, this would provide means other than the gatekeeper store for business users to get on to the mobile operating system.

## 2.3 Fairness

Lastly, DMA Article 6(12) mandates that app stores must set FRAND terms for access and prices:

*"The gatekeeper shall apply fair, reasonable, and non-discriminatory general conditions of access for business users to its software application stores listed in the designation decision."*

This is the fallback for a developer who faces the kind of tactic that Apple used in the Dutch case when the company allowed developers to use rival payment functions (likely costing very little) but then raised the developer's costs again by imposing a new 27 percent fee on developer revenue<sup>21</sup>.

The result of all the antitrust enforcement and commitments was therefore a negligible change in the 30 percent fee paid by developers. The Netherlands Authority for Consumers and Markets is now pursuing an excessive pricing case under Dutch competition law which may possibly be superseded by 6(12) of the DMA in March 2024.

## 3 App store strategies

In this section, I provide some suggestions of possible app stores that would have an attractive business proposition and therefore an incentive to enter. The value of some rival app stores will be in curation.

Today's app stores have millions of apps, but most of them are apps in which any given user is not interested. An app store that contained a curated set of apps based on a user's interests might be attractive. A store could attract users with a curated set of apps geared around a community interested in functionality, located in a geography, or otherwise having specialised demand.

Any niche content that is sufficiently attractive to users could be successful as there is no need to build network effects at the store level; rather, the store rides on the two-sided network effects already created by the CPS. Recall that under the DMA, a user must be able to have more than one app store on a handset.

Consequently, there are no barriers to setting a niche app store as the default and installing the Apple or Google app store in addition for more mainstream or generic content. A second way in which a rival app store can add value is through lower fees and more creative ways of handling payments. A third strategy is through more creative use of technology.

I will take the above categories in turn and provide some hypothetical examples of app stores that might be demanded by developers and/or users. I will use the names of real corporations to fix ideas, but stress that I have not asked these corporations if they are working on any such projects.

### 3.1 Creative curation

A 'Green Store' could contain apps that help users lower their carbon footprint. There might be no payment innovation in such a store at all, but rather its value proposition would lie in curation. The best apps for navigating public transit would be included.

The store would evaluate the electric scooters available for rent in many cities across Europe and include the one with the greenest profile in the store. The food delivery service with the lowest carbon footprint and the coffee shop with the best recycling record could obtain more customers by participating in the review process of the store.

Restaurants, banks and other brick and mortar options could be similarly evaluated, as could digital businesses. All advertising in participating apps could be required to be carbon neutral<sup>22</sup>.

An obvious candidate for an alternative app store is one set up by a parent for a child's device. A parent might want a store that has age-appropriate content that is very carefully chosen by a certain brand – for example, Disney. The store could include Disney content as well as other apps geared for children.

If the child downloaded an app from the Disney store by themselves, parents would not worry that it could be harmful or inappropriate. A parent might well want to remove all other app stores from the handset the child uses, so it is critical that the handset works without the gatekeeper's store.

A Disney store might want to experiment with payment models that allow a parent to buy 'points' to give to their child which the child could spend on content in the store, for example.

A government could establish a store that contains all the apps available for interacting with government authorities in that country. There might be federal, state and municipal apps for managing pensions, property taxes and parking tickets to name a few.

A citizen of Belgium does not want to sort through millions of apps to find the ones useful for him or her. A citizen could more easily discover useful digital services by browsing the Belgian government app store. Perhaps by entering a home address, relevant apps for a user's state and city could be surfaced or could market themselves to the relevant users.

Security in the store might be determined by the government of Belgium and then some apps might be able to share citizen's data between them (with permission). Naturally the government does not want to lose tax revenue by paying a distributor any significant percentage of revenues collected in the store, so the freedom to choose and manage a payment processor is critical to success.

### 3.2 Lower payments for developers

Presently, both app stores charge online gaming companies 30 percent of in-app purchases. Games like Candy Crush, Fortnite and Roblox are free to play but charge for additional levels, powers, better odds, or access to loot boxes. The app store keeps 30 percent of the payments users make as they play.

A Steam gaming app store could offer popular games while charging developers only 10 percent of in-app purchases, or even less if competition drives down those fees.

The app store need not have any more capabilities than incumbent app stores to attract developers, rather, it is the lower fee that causes developers to want to distribute (perhaps exclusively) through such a channel.

Once enough popular content is available in a gaming store, such a store becomes a good place for an entering developer to distribute. A company, like Valve which already has a gaming store (Steam) for PCs, could distribute the games of others as well as develop its own gaming apps for the mobile market.

A developer with niche content may not be able to induce customers to transact on a web page; a rival store could provide a frictionless distribution process at low cost. The certainty of having access to consumers at a lower cost will incentivise innovation by both app stores and apps.

A company with enough existing games may be able to attract users to a proprietary app store that contains only its own content. King Games (maker of Candy Crush, now owned by Microsoft) owns many popular mobile games. A King app store would allow the company to stop paying 30 percent of its revenue to gatekeepers and instead use that money to build and run its own store and cross-promote its own games within that store.

Games with sufficiently well-known brand names and large installed bases will help business users migrate end users away from legacy app stores to these new options.

### 3.3 Creative payment models

An association of newspapers could run a cooperative news store that contained the individual apps of each newspaper. Users could subscribe to one or more publications and pay through the store, which could be run as efficiently as possible so that the newspapers keep close to all the revenue rather than only 70 percent.

The store would establish data policies with consumers that permit more interaction between the subscriber and the newspaper, something that is often restricted in gatekeeper app stores<sup>23</sup>. Such a store could offer alternative revenue models such as 'per article pricing' using the method of payment the user has registered with the store.

Today when clicking on a link to an interesting article and finding that the newspaper is behind a paywall, a user can either buy an annual subscription, or not read the article at all. This likely results in lost sales from casual readers who do not want to accumulate many expensive subscriptions.

However, such a user might be perfectly happy to pay a small amount like 30 cents to access that single article of interest. With technologies already in use, a store could allow participating newspapers to offer micropayments for access to individual articles. This business model would allow newspapers to increase their revenues and the reach of their brands, while staying in control of their customer relationships.

The American Express card could run a store for its card holders that offers useful apps for rich people and those who travel frequently. The American Express card would be the payment method for all purchases in the store. The

store would carefully curate apps to appeal to AmEx users who might be particularly interested in new innovations, luxury versions of products and services, apps geared towards events like tennis tournaments, and so forth.

Apps that want to promote their services to card holders in exchange for discounts or special offers would be selected by the store, and those purchases would take place through the American Express card lodged with the store.

### 3.4 Creative uses of technology

Automakers might want app stores that contain both apps they market to the drivers of their vehicles, but also apps that help drivers use and maintain their vehicles. Data sharing within the store might be appropriate for safety reasons. Some apps in the store might need to connect to the vehicle and therefore have special technical characteristics.

Up until now, this article has distinguished between apps and app stores, but it may be better to think about any individual software service as lying somewhere on a continuum between them. For example, a game like Minecraft might start out as an app, but could be developed to allow users who design new tools or costumes to sell them to other users within the game.

Such a game could create a marketplace within it where gamers can buy new experiences within the game – a bit like mini games – thus making a small gaming store within the original app.

Epic Games wants to have its own app store through which it can both avoid the 30 percent fee charged by the Apple and Google stores and have more control over technology. It plans to develop the Metaverse, a virtual world

that is the vision of Epic's CEO Tim Sweeney. His idea of the metaverse is fundamentally different from the present gaming environment<sup>24</sup>.

Today, users engage in disconnected entertainment experiences such as Fortnite (which is operated by Epic), Metaverse (Meta) and Roblox (a gaming platform). In the future, Sweeney wants to replace proprietary technology with open standards, file formats and networking protocols so that all systems can interoperate and the user experience becomes seamless. Service providers, like Epic and Roblox would negotiate terms with operators to ensure they have direct consumer relationships<sup>25</sup>.

Epic brought monopolisation cases against both the Google and Apple stores in the United States in an effort to break their control and obtain the right to launch an app store<sup>26</sup>. Epic lost the case against Apple in 2021; nine out of ten of its claims were dismissed<sup>27</sup>.

Led by Utah, 36 states filed a lawsuit in 2021 alleging that (1) Google imposes technical barriers that limit third-party developers from distributing apps outside the app store and (2) requires developers to use Google Billing as a payment's processor<sup>28</sup> (Google Billing forces app developers to pay up to 30 percent of their revenues to Google).

Private Section 2 cases in the United States often settle because it is more profitable for all parties to share the monopoly profit than it is to give a substantial share of that profit to consumers by competing. It is therefore not surprising to learn that small developers and Google reached a settlement where Google would put \$90 million in a fund for developers that earned less than \$2 million from 2016-21<sup>29</sup>.

Likewise, Match Group, a former Google partner, also announced a last-minute settlement<sup>30</sup>. Google will take 11 percent of Match's subscription revenue and 26 percent of its in-app purchase revenue on transactions using

Match's own payment systems or Match will owe Google its standard 15 and 30 percent fees for transactions that use Google's in-app purchase system.

The similarity of these headline numbers to the standard Google terms (given the cost of running a payment system) suggests Match did not gain from the settlement. But if Google wanted to establish a new 'benchmark' for other developers, a settlement that does not change Google's effective fees combined with additional confidential consideration for Match would be the right choice.

Epic did not settle because the CEO sought the ability to run his own store that would control both payment and technology; a financial payout from Google would not have satisfied this goal<sup>31</sup>. That left Epic as the sole developer in the case, which it won in December 2023<sup>32</sup> (however, there is a risk that the jury's decision is overturned entirely by an appellate court or the Supreme Court when Google appeals).

Google also settled with all 50 US state AGs for \$700 million and remedies that are reportedly like those agreed to by Match, namely User Choice Billing and a somewhat easier sideloading process<sup>33</sup>. The option for a rival app store to enter on Google Android both the United States and Europe might increase the response to the DMA.

#### **4 Entrant governance and distribution regulations**

The strategies above assume that users trust the entering app store to follow all relevant laws and regulations concerning privacy, security, safety of data and so forth. However, if the app store market is opened up by the DMA, it seems likely that some untrustworthy store operators could try to take advantage of the rules to enter and exploit consumers at either a technical or commercial level.

The law contains provisions allowing the gatekeeper to safeguard against the first of these risks by taking steps that are strictly necessary and proportional to safeguard the integrity of the operating system:

*"The gatekeeper shall not be prevented from taking, to the extent that they are strictly necessary and proportionate, measures to ensure that third-party software applications or software application stores do not endanger the integrity of the hardware or operating system provided by the gatekeeper, provided that such measures are duly justified by the gatekeeper."*

The text of DMA Article 6(4) places the burden on the gatekeeper to both show the measures are strictly necessary and proportionate and to 'duly justify' them to the regulator. These requirements are critical to establishing contestability because a gatekeeper could easily make claims such as 'all entrants endanger the integrity of the operating system' and the like. Without limits on this strategy, security claims would be an effective way to block competition.

Apple and Google will have to establish a procedure for certifying that the app stores that connect to their CPS's satisfy European safety and privacy standards<sup>34</sup>. These gatekeepers may affirmatively want to authorise rival app stores to keep their users safe.

On the other hand, gatekeepers may prefer not to authorise rival app stores because users will be more likely to stay with incumbent stores if entrants seem unsafe. If users are afraid to use rival app stores, gatekeepers will benefit. By contrast, strict entry criteria can allay those fears and promote entry.

For this reason, effective compliance may require that gatekeepers create a list of proportionate criteria, including minimum security requirements, that an entering store must meet, as envisioned in DMA Art. 6(4). Then the

gatekeeper could carry out the review, making sure to use a process that is transparent and unbiased. The fee the gatekeeper charges must of course be reasonable and cost based.

An alternative approach could be to outsource the review process to approved third parties. Outsourcing is particularly attractive if the entering store has proprietary features it would like to keep confidential as it competes with the gatekeeper's store.

The gatekeeper could select third party consulting or accounting firms with the requisite skills to carry out all or part of the authorisation process according to the criteria established by the gatekeepers. Multiple businesses offering the authorisation process would assure rival app stores of cost-based pricing and lack of bias.

Authorisation should not just include technical and security criteria but also review the suitability of corporation itself to have access to end users; entrants should have appropriate governance, financial stability, transparency of ownership, ability to compensate users in case of breach and so forth.

Apps will still need to be approved in the normal way by the gatekeeper. Gatekeepers will have to show that their app approval process is unbiased and cost-based, or this step could be abused in a way that reduces contestability and fairness both in the app market and in the app store market.

Indeed, the existing app review process is critical for the easy entry of stores specialising in curation. If an entering store simply organises and surfaces the apps its group of users wants while continuing to use the gatekeeper's payment system, there is no technological change caused by such a store.

Because the apps in the rival store have been approved by the gatekeeper and continue to pay the gatekeeper, it is hard to imagine a principled objection by the gatekeeper to any element of this strategy; it simply improves the user experience for those users that choose to download the store.

Some apps will choose to be exclusive to one app store because it has favourable terms or provides a strategic partnership. It seems inconsistent with the goals of contestability and fairness for gatekeeper stores to require exclusivity from third-party apps exactly because the most popular apps could help rival stores gain traction with users.

The DMA does not directly prohibit other popular apps of the gatekeepers themselves, eg. Gmail, from being exclusively distributed through the gatekeeper's store. It is not clear to me how the DMA will affect the distribution of apps that are themselves Core Platform Services, for example YouTube and Google Maps.

However, if many apps choose an exclusive distribution strategy, this increases the likelihood that users will want multiple app stores on their handset. Multihoming will become common.

User multihoming raises the question of search costs for users trying to find a particular app. If a user opens her default store to search for a particular app and the store does not have it, can the store let her know which stores do carry that app?

Such a functionality clearly improves the user experience. But more importantly, it strengthens entrants' ability to be an attractive default store. If a user must carry out a separate search in each store to find the app she is interested in, she will begin in the store with the greatest number of apps, which is likely to be the legacy store.

Once the user is in the legacy store, if she does not find the app she is looking for, she will likely be offered a substitute which she may choose and download because of both choice architecture and search costs. The original app that she was searching for then loses that sale. This pattern of behaviour will make it much harder for entrant stores to attract developers and therefore users.

If, by contrast, the entrant store can inform a user of the existence of a searched app in a different store, that entrant store becomes an attractive ‘first port of call.’ This functionality requires app stores to share the data on which apps they distribute at what prices in a public manner, just as video streaming services do in the US<sup>35</sup>.

Note that the entering app store cannot sell the app it does not distribute, nor otherwise benefit from the listings of other stores. Indeed, a listing is likely to send the user away, and therefore benefits stores that share their data and distribute many apps.

A universal search functionality therefore benefits everyone: users, entering stores, developers, and large legacy stores. While mandating universal search in a setting in which consumers multihome may seem obvious, it has been controversial in the past – for example, in the airline industry.

Big airlines have refused to push out their flight schedules to metasearch sites such as Kayak and Flight Penguin while doing so for limo services and other complements<sup>36</sup>. This was the case even though the metasearch sites did not sell any tickets or charge the airline any fees, but simply linked users to the airline’s own site to buy the ticket.

Reducing user search costs is not typically a profitable strategy for a provider with market power. Gatekeeper stores may therefore claim some combination of lost ad revenue, trademark infringement, or breach of existing agreements as reasons not to share listing data.

The Commission may have to affirmatively approve the sharing of store data and/or suggest that withholding it could be a competition violation. Additionally, to maintain this functionality as the market develops and entrant stores grow, sharing app lists could be required to obtain annual authorisation for a rival store, as well as be a requirement for legacy stores<sup>37</sup>.

The distribution of rival app stores is an interesting problem. How will users obtain such a store? One option is that gatekeepers are required to offer a 'store of stores' in which they distribute authorised rival app stores.

Another is that those approved rival stores are located within the legacy app store where they can be easily found by users alongside apps. A third is that rival stores are sideloaded from the web. The first two options require the gatekeeper to include authorised entrants in reaching customers, which is against its financial interests.

The third puts the most hurdles in the path of the entrant, but also requires more technical work from the gatekeeper to maintain security while permitting entry, as is required.

Many of the stores we expect to see entering at first will specialise in curation only, meaning that they will only be distributing apps that are already approved by each gatekeeper. Such stores are particularly safe from a technological point of view.

Moreover, they also comply with the privacy and content policies of each gatekeeper (eg. no pornography). Because such stores are just bundles of approved apps that do not harm the gatekeeper's reputation in these ways, it may be sensible to require the gatekeeper to distribute that kind of rival store in its gatekeeper store, or in its 'store of stores' if it chooses to create one.

Such rivals will then be easily discoverable by users and can be downloaded without any friction. The same may be true for stores that change only the payment method they use, but otherwise simply curate a group of approved apps. This strategy also raises no difficult issues for the gatekeeper.

An approach that existing developers may use is to update a popular flagship app already distributed in the legacy app store. The new app could take advantage of the elimination of gag and anti-steering rules to guide consumers to additional apps outside the legacy store. The flagship app will explain, promote and steer a consumer to an offer that is available through a link outside the legacy app store.

The offer would be attractive in some way - lower prices or greater benefit - which would cause the user to click to obtain the update to the app. For example, a user could open their favourite gaming app and see a link to a version of the app that offers more powers, free features, or extra points.

When the user clicks on the offer, they are taken to the web where they download a new version of the app. This app would contain within it the ability to surface and obtain other games and to accept payment – the critical functionalities of a store.

In other words, there is no fixed boundary between an app and a store, but rather a progression of functionality. Rival stores may start out as new versions of a gaming app with an alternative payment system. This strategy provides access to the installed base of the popular app and reduces user friction. The app can then grow over time to offer more games inside itself, marketplaces and social functionalities as business users learn what works and what users want.

In this narrative, the path from a single app to a store is a continuous one, rather than a discrete jump. Such a path would enable the rival app store to continue to distribute its app in the legacy store and allow the millions of users in that store to easily discover it. But users who then upgrade gain the advantages of competition because of the better offers and functionality they can now choose within that store.

Apps that do something technologically innovative raise more difficult distribution issues because they may not fit the policies of the existing legacy app store and therefore cannot be discovered by users on that channel. These rivals may have to use the alternative channels the law provides. Apple has argued that allowing sideloading raises security concerns (Apple, 2021).

It is worth noting that platforms have overcome the technology dimension of this problem in the past. Both the macOS and Windows allow users to purchase apps from many sources<sup>38</sup>. Sweeney points out that “*it's the operating system kernel that provides the security*” by preventing apps from accessing data and services they aren't allowed to access<sup>39</sup>.

But sideloaded apps might also violate the content standards of the gatekeeper which come in two types. A gatekeeper's aesthetic standard (eg. a game called 'COVID') serves as a dimension of differentiation and is likely not a concern in a sideloaded game or store.

Other store standards, such as the prohibition of illegal gambling or apps selling counterfeit goods could be part of the rival store authorisation rules because such rules protect end consumers from danger. Rival stores would require authorisation to operate on the gatekeeper regardless of the channel through which they were distributed.

The fact that app stores will pay no fee for interoperability with the software functionality of the core platform service (CPS) requires discussion (DMA Art. 6(7)). The topic of optimal access fees has a long literature in regulatory economics (eg. Laffont and Tirole, 1993). The benefit of optimal access fees is that they create the right levels of investment and innovation on both sides (Tirole and Bisceglia, 2023).

The DMA recitals indicate that the European Parliament found a lack of innovation on the side of the gatekeeper despite the large rents flowing to gatekeepers. Therefore, one purpose of the DMA is to rebalance rents to provide returns to investment and innovation on the business users' side where innovative potential may be unrealised<sup>40</sup>.

This argument may explain the European Parliament's choice to mandate access at no charge in so many places in the DMA. Moreover, to the extent the European Parliament feels the corporations in question violated the antitrust laws to obtain their market power, it may not be equitable to then permit them to collect yet more profit from business users.

In addition, a fee of zero is much easier to administer and enforce than many different fees over which the parties litigate for years. If Apple or Google charge fees to rival apps, such business will have higher accounting costs than Apple's or Google's versions of those businesses<sup>41</sup> and would therefore be less viable when competing against them. This harms both contestability and fairness.

The same holds true for app stores. Because the outside option for the business user (disintermediation of the app store) is so good, an entering app store that pays extra fees to the gatekeeper on top of its own costs may not be competitive in the marketplace, whereas an app store whose fees are driven only by the costs of running the store will be.

## **5 Next steps**

New app store entrants are entitled to operate using these business models beginning in March 2024 when Core Platform Services must comply with the DMA. An entering app store that wants to attract consumers in March must get ready beforehand. It must build its software, work out its value proposition to users and develop a business model. The first requires engagement with the gatekeeper mobile operating systems.

Business users must receive from the gatekeepers all the technical specifications needed for an app store to interoperate with the operating system. Business users will also want to know what security checks the gatekeeper plans on performing, which will involve corporate processes such as insurance and governance of the security of data and review of the underlying code.

Gatekeepers will need to establish clear timetables for app store reviews. If gatekeepers are unprepared or unwilling to disclose this information to app store entrants before March 2024, then entry will necessarily occur later, thereby delaying the benefits of contestability and fairness to both business and end users.

Moreover, if there is any problem with a gatekeeper's plan such that a competent rival store is not able to exercise its rights in March of 2024, then that gatekeeper will have failed to comply with the DMA and the Commission may open compliance proceedings. Significant fines could result, or, in the case of multiple infractions, structural remedies such as divestiture of the app store could be imposed.

For this reason, it is prudent for gatekeepers to start engaging with entrants before the deadline so that the interface they offer in March functions correctly and has proportionate entry criteria.

It is also possible that the surplus unlocked by allowing app stores to enter, differentiate and innovate is sufficiently large that gatekeepers decide it is more profitable to benefit from this new world rather than fight it. Such a calculation might be more likely if gatekeepers face regulatory or legal requirements in more than one jurisdiction.

For example, litigation in the US may require Google to make significant changes to the way it treats rival app stores. There are surely economies of scope to running one app store interface that is compliant in all jurisdictions.

Apple's revenue primarily comes from non-app store sources such as the sale of hardware; the company's hardware and services will be more valuable if users can discover and use more innovative apps in the Apple ecosystem.

If both gatekeepers determine that making rival app stores work well is, all things considered, the most profitable strategy, then they will have a reason to comply. The regulator's role would become easier in this setting, though technological choices would no doubt remain contentious.

In either case, effective enforcement by the European Commission will be critical to the existence and functioning of rival app stores and the timing of their entry. ■

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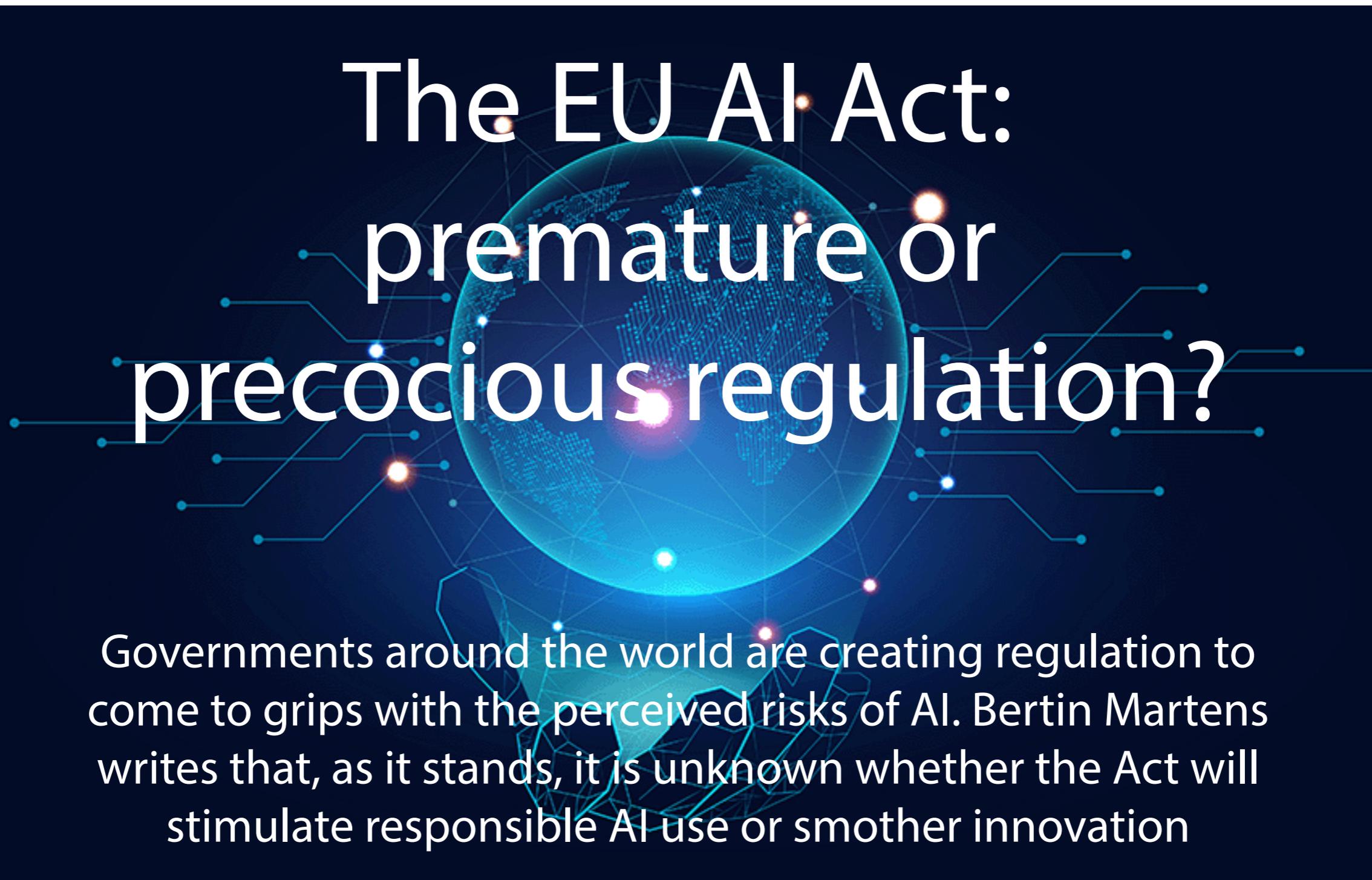
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# The EU AI Act: premature or precocious regulation?



Governments around the world are creating regulation to come to grips with the perceived risks of AI. Bertin Martens writes that, as it stands, it is unknown whether the Act will stimulate responsible AI use or smother innovation

**G**overnments around the world are creating regulation to come to grips with the perceived risks of Artificial Intelligence (AI). The United States issued an AI Executive Order<sup>1</sup> while the UK government released a non-binding Declaration of Principles<sup>2</sup>. China imposed a light-touch business-friendly AI regulation, primarily meant as a signal to accelerate technological progress (Zhang, 2024).

The European Union's Artificial Intelligence Act was proposed by the European Commission in April 2021 and the agreed final version is set for formal approval in the European Parliament and Council in April 2024.

### **What does the EU AI Act aim to do?**

The Act is essentially a product safety regulation designed to reduce risks for humans from the use of AI systems. Product safety regulation works for single purpose products; the risks from application for that purpose can be assessed.

Many older-generation AI systems are trained for a single application. The problem comes with the latest general purpose Large Language Models and Generative AI systems like OpenAI's ChatGPT, Meta's Llama or Google's Gemini, which are models that can be moulded for an almost infinite range of purposes. It becomes difficult to assess all risks and to design regulations for all possible uses.

The AI Act tries to work around this with a general obligation to avoid harm to fundamental rights for humans. According to one of the co-architects of the Act in the European Parliament, this regulatory mix of product safety and fundamental rights criteria is not adapted to AI models<sup>3</sup>.

The AI Act classifies AI systems used in the EU, irrespective of where they are developed, according to level of risk. Most AI applications are considered minimal risk and not regulated. Limited risk systems are subject to transparency and user awareness obligations only, like chatbots and the watermarking of AI media output.

Meanwhile, systems that are deemed to pose unacceptable risks are prohibited. These systems include remote biometric identification and categorisation, facial recognition databases and social scoring – with exceptions for medical and security reasons, which are subject to judicial authorisation and the respect of fundamental rights.

The bulk of the AI Act focuses on regulation of high-risk AI systems, in between limited and unacceptable risk. These are single- or limited-purpose AI systems that interact with humans in education, employment, public services etc. The Act contains a complex set of rules and requirements to assess whether and under what conditions high-risk systems can be used.

*The EU AI Act as it stands is just the start of a long regulatory process. It delegates responsibility to the Commission and its newly created AI Office to draft implementation acts and guidelines to address these challenges*

Besides high-risk AI systems, there are General Purpose AI (GPAI) models. This refers to Large Language and Generative AI foundation Models<sup>4</sup>. These are considered general purpose because they can be applied to a wide range of tasks. GPAI providers must present technical documentation and instructions for use, unless they are open license models that can be adapted by users for their own purposes. Data used for training must be summarily documented and must comply with the EU Copyright Directive.

In the law, GPAI models become systemic risk models when the computing power used for their training exceeds 10 flops (floating point computer operations). Providers of systemic risk GPAI models must conduct model evaluations and adversarial testing, provide metrics used to avoid harmful applications, report incidents and ensure cybersecurity protection.

Currently available models do not reach that threshold<sup>5</sup>. But next-generation AI models, which could possibly be released in 2024, are likely to exceed the threshold. Eventually, it may capture all new large AI models.

### **Fundamental human rights safeguards and risks in AI models**

The AI community has put a lot of effort into human-centric AI and the ‘alignment’ of AI model responses with human values, avoiding discrimination and harmful responses. That chimes with the contemporary diversity, equity and inclusion debate that targets racial, gender, sexual and religious discrimination.

Some companies go to great lengths in this respect. Google trained its Gemini AI model to prioritise racial diversity over historical correctness<sup>6</sup>. But there are many other discrimination criteria that are frequently used.

For example, price and income discrimination may be either welfare enhancing or exploitative when used for better targeting of economic services and subsidies. A rule that allows or bans it will for sure make a mistake in one direction or the other.

This raises questions: whose values, harms and benefits should we align with? AI is already being used in defence and warfare: is that a human-centric application?

GPAI developers try to ensure respect for human values by building 'guardrails' into models. However, there are many ways to circumvent these guardrails<sup>7</sup>, through poisoning attacks that manipulate training data to falsify outputs, introducing malicious code via pre-packaged prompts, sponge attacks that destabilise computing power in the AI system, inference attacks that reveal hidden data that it is not supposed to be disclosed or deception attacks by means of visual illusions that are invisible to the human eye. Some developers try to build 'constitutional' guardrails for models to self-check whether their responses comply with obligations<sup>8</sup>.

Open GPAI models are more prone to loopholes to circumvent guardrails. But openness may spur innovative applications and new revenue-generating business models that are especially important for smaller AI firms that do not have a well-established business setting where they can put their models to work.

The AI Act leaves developers of open models off the hook, unless they represent systemic risks, by exonerating them from testing obligations and passing on that responsibility to re-developers and deployers who can modify the behaviour of these models. It is more difficult to track regulatory compliance when many layers of complementary application providers interact.

Smaller models also escape stringent AI Act obligations because they do not meet the computing power threshold. Besides lowering training costs, this exemption also reduces regulatory compliance costs. While they can be just as versatile as larger models in the range of applications, they usually give less accurate replies unless they receive additional guidance from prompts and user datasets. Smaller models therefore do not necessarily imply lower risks.

The AI Act obliges large model developers to explain to downstream deployers and service providers how a given model interacts or how it can be used to interact with hardware or software that is not part of that model. This is a very generic provision that will require further clarification through implementing acts.

It raises intriguing questions about vertical and horizontal integration between GPAI models and complementary services and the responsibilities of these parties in the context of the AI Act. Who is the deployer when an online travel services platform pulls in an AI application to improve consumer services: the application provider or the platform? There may be several layers of deployers – an issue currently not covered by the AI Act but subject to interpretation in implementing guidelines.

The incompleteness of the AI Act fails to provide legal certainty to AI developers and deployers. Moreover, it generates high compliance costs, especially for SMEs and start-ups that might find the EU regulatory environment too costly and risky<sup>9</sup>.

However, the Act sets the scene for further regulatory work for the European Commission and its newly created AI Office. The Office will register and verify notifications sent by AI developers. However, the Office will contend with limited resources and will take a while to get up to speed.

It will have to produce more than a dozen detailed implementation acts and guidelines, including delegated acts on the definition of AI systems, clarifying further the criteria for high-risk AI systems, adapting thresholds for general purpose AI models with systemic risk, specifying technical documentation requirements for general purpose AI and conformity assessments as well as issuing a code of practice for providers of general-purpose AI models.

Moreover, it can clarify prohibited AI practices, requirements for high-risk systems and transparency obligations ‘when deemed necessary’. This may expand or tighten the regulatory space within which AI model developers can operate in the EU.

### **The AI Act and competition**

There are by now several dozen large AI foundation models and many smaller models. Numbers are growing exponentially. There is vigorous competition between AI developers but no sign of emerging monopolistic gatekeepers yet, except perhaps at the level of AI computing infrastructure where big tech firms clearly dominate.

The EU is currently not home to very large AI models. Regulators may count on the ‘Brussels effect’ of the AI Act: if other countries adopt similar regulations, it will level the competitive playing field and weaken incentives for developers to circumvent regulatory compliance costs and move elsewhere.

Moreover, a Brussels seal of confidence may make an AI model more attractive and competitive. However, stringent and costly regulatory conditions for large models may further entrench small AI developers in a niche market for smaller models that remain below the regulatory radar for systemic risks but also far away from the technology frontier.

The competition policy implications of AI technologies are not clear at this stage. The development and training of frontier models costs hundreds of millions of dollars and is often beyond the reach of AI start-ups. Established big tech firms including Google, Meta, Microsoft and Amazon have leveraged their extensive cloud computing infrastructure to develop their own large AI models.

Start-ups, often created by former big tech employees, are more innovative and closer to the AI technology frontier. However, they require close collaboration agreements with large tech firms that make expensive computing infrastructure and data available in return for access to the model.

The recent agreement between the French AI startup Mistral and Microsoft illustrates this<sup>10</sup>. These agreements stop short of mergers. Competition authorities have started looking into the nature of collaboration between OpenAI and Microsoft<sup>11</sup>. To what extent smaller AI models, that are sufficiently performant for a wide range of tasks, can compete with larger firms and models remains an open question.

The AI Act has a narrow focus on regulation of self-standing large AI models. But the rapid emergence of decentralised AI ecosystems, whereby AI models are increasingly interacting with complementary and competing platforms and software through apps and plugins means systemic risks cannot be assessed by focusing on a single model; one needs to look at the whole system.

Risks are shifted between developers, deployers and users. How much vertical and horizontal complementarity and integration between models and other system components can be allowed before it distorts markets?

There is a booming ecosystem of purpose-built ChatGPT applications<sup>12</sup> that enhance model performance with extensive sets of natural language prompts and proprietary datasets that guide it towards answers in specialised domains.

GPAI models are becoming operating systems on top of which deployers and end users can build their own apps for specific applications. Plugins enable it to connect to existing platforms and software, like to explore travel,

e-commerce and other services, or perform specialised calculations and services. AI app stores may eventually overtake smartphone app stores with all-purpose services apps.

### **AI and copyright**

Training models require massive data inputs, including text harvested from webpages, scanned documents and books, images collected from the web, video from film archives, sound from music collections. Much of this is subject to copyright.

The EU Copyright Directive<sup>13</sup> includes an exception to copyright protection for text and data mining purposes, provided the user has legal access to the inputs (ie. no hacking of paywalls for example). Copyright holders can opt-out of the exception and charge fees.

Several news publishers have reached licensing agreements with big tech AI developers who can afford the fees. AI start-ups are waiting for the outcome of several pending court cases that should clarify the interpretation of copyright law for AI applications, including the application of the 'transformative use' copyright doctrine in the US.

Licensed datasets may be of higher quality and reduce training costs. But they may also reduce the set of available training data and result in biased training.

Moreover, granting copyright on training inputs gives the private interests of copyright holders leverage over the wider social welfare implications of AI models that are rapidly becoming a general-purpose technology that is used across all sectors in the economy, far beyond the creative media industries that have a private interest in copyright.

Creative artists who use AI start to claim copyright on outputs. The AI Act states that AI audio-visual and text outputs should have machine readable watermarks to distinguish them from human outputs and deepfakes. Watermarking technology is still in the early stages and easily subject to circumvention<sup>14</sup>.

The watermarking obligation does not apply when AI only assists humans. In most countries, only human outputs can claim copyright, not machine outputs. How much human contribution is required in a hybrid output to claim copyright? A single line of human-written ‘prompts’ may not be enough, but a Chinese court recently granted copyright to a developer of a complex set of prompts (Wang and Zhang, 2024). These issues show the EU Copyright Directive may need some re-thinking<sup>15</sup>.

The EU AI Act as it stands is just the start of a long regulatory process. It delegates responsibility to the Commission and its newly created AI Office to draft implementation acts and guidelines to address these challenges. These will drive enforcement of the Act and determine to what extent it will be a precocious instrument to stimulate trustworthy AI innovation or a premature innovation-smothering regulation. ■

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# The chicken-and-egg problem in the EU Digital Markets Act



Business users are needed to help create useful interfaces, while useful interfaces are needed to justify investment and entry by business users. Fiona Scott Morton considers possible solutions to this dilemma

**T**he gatekeeper platforms regulated by the European Union's Digital Markets Act (DMA) must comply with the law as of 6 March 2024. The DMA requires that core platform services create and make available interfaces that allow business users to access end users via the platform at lower cost and on better terms.

For example, app developers will have the right to distribute on handsets through different app stores, using different payment services, directing users to purchase content on the web and charging different prices in different channels. The gatekeeper must provide the application programming interfaces, or APIs, to enable business users to take advantage of these rights.

However, the DMA does not define exactly what those APIs should be. Rather, the law requires a gatekeeper's interface to be 'effective', meaning business users can use it to enter, compete and innovate. Because such a design is not, in general, in the interest of the gatekeeper, the input of business users to both gatekeepers and the European Commission is critical for evaluating compliance with the law.

Thus far there is little evidence of platforms interacting with business users or putting out interfaces for evaluation by business users, or of business users offering comments on what interfaces would be best for entry and competition.

It may be that the interface must come first, and then its existence will stimulate entry of new business users or investment into new services that will use the interface. Rather like the chicken and the egg, which should come first? Business users are needed to help create useful interfaces, while useful interfaces are needed to justify investment and entry by business users.

## 1 Introduction

The European Union's Digital Markets Act (Regulation (EU) 2022/1925) facilitates access for business users to the core platform services of large digital gatekeepers so that those business users can innovate and grow. However, successful enforcement of the law requires those business users to engage in the regulatory process to help define the interfaces they will use to access the platform.

*If the business must seek permission from the gatekeeper to enter, and this requires the entrant to share technical information, its business could be copied by the gatekeeper or discriminated against. In this case the business user would have invested without gaining anything, and indeed would be harmed by participating*

Under the law, the regulated platforms must develop the relevant technical specifications of the interface and share them with business users. An interface could be the APIs that, for example, allow a rival app store to function on a handset's operating system, a rival payment system to offer services to apps or a business user to obtain valuable data.

This engagement by the business user is needed because the DMA requires that the interface be 'effective' in order to be compliant with the law – in other words, the business user can run its business using the new interface. Without engagement from business users, it is difficult for the European Commission to evaluate effectiveness.

If gatekeepers, which are the large, unavoidable platforms regulated by the DMA, design interfaces without such interaction, they may not be useful to existing and future business users. Flawed interfaces are less likely to increase contestability and fairness, which are the goals of the DMA. Effective interfaces are also necessary to maximise business-user innovation that benefits consumers.

The adoption of interfaces without sufficient input from business users seems at time of writing to be a substantial risk, given the limited progress to date and the rapidly approaching compliance deadline of 6 March 2024. Europe is home to app developers, merchants, video channels, news, banks, digital advertising services and other complements to the gatekeeper platforms.

If these businesses wish to be protected from the market power of digital gatekeepers and, indeed, obtain new opportunities to grow and innovate, they have a responsibility to engage. By the same token, the European Commission will need to deliver for these business users by requiring gatekeepers to be responsive to the legitimate problems they raise.

The Commission will also need to protect business users who rationally expect retaliation (perhaps globally) from gatekeepers. Retaliation or lack of competence on the part of the Commission would severely limit the interest of business users in engaging in the process and would risk undermining the effectiveness of the DMA.

Moreover, if few business users step forward with innovative plans, it will feed the narrative that Europe cannot innovate, not just in gatekeeper platforms, but in complements as well.

## **2 The chicken-and-egg problem**

The Digital Markets Act regulates business-user access to 22 core platform services provided by gatekeepers, so that those business users are able to connect with end users, are not burdened with costs and restrictions imposed by the gatekeeper and can innovate in ways the gatekeeper may not prefer.

In order to be sure each core platform service's interface enables business users to achieve those outcomes, it is particularly useful if they engage in the regulatory process to help define the interface. If an interface is not effective at achieving contestability and fairness, then the gatekeeper concerned is not in compliance with the law.

The interfaces defined by the DMA are not open to business users as a right today. Beginning on 6 March 2024, gatekeepers must make these interfaces available to business users. But because the interfaces are currently not available to business users, existing business users have not yet built products that will be accessible through the interfaces, and of course new business users have not yet entered and begun operation. This dynamic causes the following chicken-and-egg situation:

- An existing, functional interface enables the arrival of a business user.

- An existing business user must engage with the regulator to enable the arrival of a functional interface.

The second part of the conundrum occurs because the DMA provides no list of technical specifications or code that platforms must use to design their interfaces. The law uses regular English-language words to describe the rights the business user has and what the business user should be able to accomplish with those rights.

Compliance is therefore defined not in a technical sense but in outcomes: can a business user effectively employ the interface to achieve the goal described in the rule? Compliance means the business user can enter and be functional. In addition, interfaces must not discriminate or be biased between business users, or between business users and the gatekeeper's own businesses.

Second, compliance is defined using the idea of effectiveness, meaning that an interface design that does not offer a full working solution to access the CPS is not compliant.

However, such a practical definition creates a challenge for the bureaucrats enforcing the law. The regulator cannot determine if the interface complies by examining its code or technical features used.

Nor can government lawyers know and appreciate the needs of entering business users, and whether the gatekeeper's proposed interface is designed to enable business users, is deficient in major respects, or subtly undermines rivals' competitive advantage.

### **3 Alternatives**

There are two common alternative routes to regulating interfaces not chosen in the DMA. One approach is to specify in detail the technology to be used. Telecoms regulators have taken this path in many cases over past decades, from phone jacks to the allocation of spectrum bands to standards for mobile telephony (Contreras, 2019).

However, a difficulty with specifying technological solutions in the context of modern digital platforms is that it creates a heavy burden on the regulator. The regulator must become an expert in the technology of a particular core platform service, affirmatively describe the solutions it wants the gatekeeper to use and update them as technology changes. And that work must be carried out for each core platform service.

The Commission would likely face difficulties in hiring enough qualified engineers to design so many interfaces, to say nothing of keeping solutions current as technology changes. Gatekeepers and business users would likely disagree regularly with the Commission's technical choices, and this would lead to argument and litigation.

Providing the technical solutions in this way is simply not practical in light of the huge asymmetry of information and skills between gatekeeper platforms and Commission staff.

A second approach used for many technological interfaces is to rely on the work of a standard setting organisation (SSO). The SSO is comprised of a large group of stakeholders who decide by consensus on a common standard for the industry to adopt (eg. electricity, 5G, Wi-Fi).

Often there are many types of stakeholders in the SSO who have differing goals and incentives. For example, the standards adopted for mobile telecoms will affect handset makers, chip makers, equipment makers and carriers, among others.

In addition, many of these parties have market power in their industries and/or proprietary technology they want the standard to include so they can earn licensing revenue. Any interested company can participate in an SSO as long as it abides by the organisation's rules.

It can be difficult and slow for all these different parties with their different interests to agree on a common standard – and this can be inefficient when technology moves quickly.

Furthermore, the choices of technologies included in the standard can be distorted by the economic power of certain members and the coalitions and compromises adopted in order to get agreement. For these reasons and others, the SSO approach to interface design is far from perfect (Bekkers *et al* 2023; Simcoe, 2012; Farrell and Simcoe, 2012).

However, it is an open, workable mechanism that allows industries to adopt technologies that require substantial coordination to deliver consumer benefits.

But importantly, the settings in which SSOs are used differ greatly from those addressed by the DMA. A designated gatekeeper under the DMA is a long-established monopoly or duopoly platform that business users need to access in order to reach end consumers. The gatekeeper alone has made technical choices and developed its interface over time. The gatekeeper's own capabilities, complementary assets and strategy have affected those choices.

The interface is not a future technology for which no technical standards have yet emerged. A traditional SSO would be a committee of third parties, including some business users, tasked with designing the gatekeeper's interface. For this reason, the SSO approach to achieving contestability and fairness is probably not the least-burdensome regulatory technique from the perspective of the gatekeeper.

On the other hand, the business users who wish to connect to the interface are a heterogeneous group with different business and technical strategies, despite their common goal of creating an effective interface. This group

might benefit from a structure similar to an SSO to help them coordinate and interact with both the gatekeeper and the Commission.

#### **4 Fit with market structure and technology**

The advantages of the DMA include its recognition that the gatekeeper has the most knowledge of its own technology and the clearest view of its future plans for the development of that technology in light of current trends and is therefore best positioned to develop APIs that function well.

The law requires the gatekeeper to deploy an interface that business users can use to enter, compete and innovate. The DMA further regulates how the gatekeeper can use its interface to affect competition on the platform.

For example, the rules prohibit bias in ranking and indexing. The gatekeeper is likely to find this approach less intrusive than the technical-specification or SSO options because the gatekeeper retains control over its own technology and can make efficient choices, while adhering to the requirement that the resulting interface be functional for the business user.

However, this discussion makes it clear why the regulator needs engagement from these business users in order to know what to look for in the interface, what questions to ask of the gatekeeper and the importance to place on different elements of compliance.

In addition, there is the problem of the valuable and innovative business users who are at an early stage of development and are therefore difficult to help. Of course, many business models will be straightforward and predictable.

It is very likely, for example, that gaming and dating apps want to use rival payment services, and banks want to enter with their own digital wallets. However, successful DMA enforcement will stimulate creative new ideas from business users that may not be obvious currently.

The business user's role, therefore, is to engage with the gatekeeper, provide feedback to the gatekeeper, inform the Commission about problems or trade-offs in the gatekeeper's proposed solution and provide technical information to Commission staff, who must have compliance conversations with the gatekeeper.

Without the regulator and the business user community functioning together, the resulting interface is likely to be flawed, and possibly not very useful for entrants.

It is this last step that seems to be a shortcoming in the design of the DMA. There is no instruction in the law that lays out how a gatekeeper must communicate to current or potential business users, nor is there any timetable of when these communications must occur<sup>1</sup>.

Waiting for business users to appear has the drawbacks described above. And because asymmetry of information is severe between gatekeepers and business users, any unsupervised negotiation between them may not result in outcomes that are sufficiently contestable and fair.

## **5 The cost of risk and delay**

The concern that this negative feedback loop will cause risk and delay is first order. Gatekeepers have no financial incentive to provide the kind of interface for business users that would facilitate entry and competition – which would lower their profits.

Therefore, only robust oversight by the Commission, in combination with information from potential entrants, is likely to establish the right conditions for timely entry. To launch on 7 March 2024, a business must have already worked out its strategy, developed a revenue model, designed its code based on technical information from the gatekeeper, and so forth.

Suppose, for example, that a rival app store wishes to launch on iOS and Google Android, both of which are regulated core platform services. For the entering store to develop its software for review by the CPS, it must be told the technical specifications of the interface the CPS will be adopting.

The CPS may also want to undertake a security review of the entering app store and closely examine its code and technology. But for that to happen, the code must be written. Supposing the entrant has its technology created and is ready to enter. Can it offer its product for use by consumers and expect the store to function, or will the CPS require a review of the rival's corporate governance, insurance policies, data storage practices and the like?

If the CPS wants to carry out such a review to protect consumers, this will take time, and an entrant that is otherwise ready will want to start the process before March 2024.

Other issues of interest to the business user will likely include features and functionality of the interface, such as what authorisation is needed for the store to be sideloaded. If the CPS does not want to develop safe sideloading, will the CPS carry the rival store within the legacy app store or in some other channel?

Legacy stores engage in automatic updates and allow a user to keep track of subscriptions; the APIs for these features must be made available and equivalent for entering app stores so that their service is comparable.

The gatekeeper could make any of the parameters above unworkable, slow, expensive or biased – which would constitute noncompliance with the DMA. But if the regulator does not understand the existence or extent of the noncompliance, it cannot effectively take action against it.

The entering business user may need to seek funding from banks or venture capitalists if it is not part of a large corporation with enough free cash flow to fund its entry costs. The providers of capital will engage in due diligence and evaluate the risk of the project. There are the usual risks inherent to new businesses, such as the competence of management and demand for the service.

But venture capitalists will also consider the risk of a new business losing access to its end consumers – because the business must access those consumers through the gatekeeper's interface. On top of standard business risk, the entering business will need to manage the risk that the interface will be biased, will fail to include some technology or even will not exist.

Good enforcement would reduce or eliminate those risks. VCs will therefore evaluate the DMA, its legal strength and the competence of the enforcing authorities<sup>2</sup>. If sources of capital are deterred by regulatory risk, then entrants who should be helping the Commission ensure a working interface may simply fail to exist (Krueger *et al* 2020; Hail and Leuz, 2006).

Of course, the Commission could simply wait until after the deadline to see if what the gatekeepers themselves create results in successful entry. If at that time no entrants appear, the Commission could then engage with business users to find out why they have not entered.

A conceptual problem with this approach is that some of the missing business users will be entrepreneurs who will not exist until the interface creates conditions conducive for investment.

Second, if the gatekeepers have complied according to their own definitions and that compliance is simply not useful to potential entrants, the DMA and the Commission will look ineffective or incompetent.

At that point the steps needed to implement a useful interface will likely take another year, given the time needed for a regulator to evaluate existing compliance, interact with technical and business experts, communicate with the gatekeepers and then wait for the engineering cycle to repeat.

Third, a delay of this type, in addition to failing to change fairness and contestability, weakens trust in the law. This, in turn, impacts business users' incentives to invest, as noted above. Uncertainty about whether the regulator can deliver on usable interfaces lessens the ability of new entrants to raise capital and innovate.

## **6 Interpretation of lack of entry**

The DMA requires each gatekeeper to report, six months after designation as a gatekeeper and annually thereafter, on "*the measures it has implemented to ensure compliance with the obligations laid down*" in the DMA (Art 11(1) DMA)<sup>3</sup>.

Among many other things, gatekeepers must use the template established by the Commission to report on business-user entry in each of their core platform services. For example, the template instructs gatekeepers to report:

(2.1.2(r)) "...depending on the circumstances, data on the evolution of the number of active end users and active business users for the relevant core platform service and, for each relevant obligation, the interaction of end users with choice screens and consent forms, the amount of in-app purchases, the number of pre-installed defaults as well as yearly revenues from payments related to those pre-installed defaults, counts of end users who switch, counts of business users who obtain data access, etc."

and

(2.2) "A list of the Undertaking's core platform service's top fifteen (15) business users per core platform service based on revenues established in the EEA for the last year..."

Gatekeepers may be concerned that if there is no entry in a CPS, this fact will be used to demonstrate noncompliance. However, such a strong conclusion might not be warranted because entry requires action from two parties, both the gatekeeper and the entrant.

Therefore, lack of entry is, alone, not proof of gatekeeper noncompliance. Rather, it is useful evidence because it creates a one-way flag. If entry has occurred, then clearly the interface works at least at some basic level. By contrast, if there is no entry, this is a concern that requires the regulator to follow up and find out why business users are absent.

The first possibility is that there is no interest in entry on the part of business users because the opportunity is not profitable. However, if the European institutions responsible for the DMA engaged in appropriate research to design the law, and successfully responded to concerns of business users, then it seems unlikely the DMA would identify core platform services where access is not, in fact, demanded by business users.

A second possible explanation for a lack of entry is that the business users are interested but are waiting until the uncertainty around enforcement of the DMA is resolved before investing. Business users may not want the risk of spending money on a project that depends on a new law with a new method of enforcement. They may be concerned the interface they need won't work well enough to support a viable business.

Enforcement might deliver a basic interface and the rules for using it in March 2024, but this will only serve as a start to negotiations between business users and gatekeepers. Innovative entry will have to wait until the next engineering cycle, after these negotiations have taken place.

Worse, business users may not trust that the Commission will be able to execute this law at all. The required interface may not materialise. The Commission could be outlawyered or outmanoeuvred by the gatekeepers so that – despite the provisions in the law that try to protect against this outcome – both the Commission fails to enforce, and courts do not mandate the required interfaces. Business users fearing this outcome will be reluctant to invest until they see proof of working interfaces.

Possibly business users will not have entered because they are afraid of developing a business that will compete with the gatekeeper or are afraid of engaging with the Commission to critique the gatekeepers, because they expect retaliation from gatekeepers.

For example, the Commission might share the concerns, meetings or filings of such business users with the relevant gatekeeper. This might be necessary to explain the needed improvements or demonstrate demand for them, or it might be considered necessary as part of the rights of the gatekeeper, which could face a noncompliance proceeding if it fails to respond. However, in either case, sharing the information may expose the business user to retaliation.

That retaliation may be subtle or difficult to measure. Its cause may be impossible to assign with certainty and may occur outside the European Union. The possible insufficiency of existing protections for complainants is a serious concern.

Relatedly, if the business must seek permission from the gatekeeper to enter, and this requires the entrant to share technical information, its business could be copied by the gatekeeper or discriminated against. In this case the business user would have invested without gaining anything, and indeed would be harmed by participating.

A group that deserves analysis is existing gatekeepers who may be considering entering against other gatekeepers. Many gatekeepers have smaller businesses that compete with a designated CPS, or they have the assets needed to build a rival and enter. The DMA will lower the costs of entry or growth for these rivals as well.

However, gatekeepers may assess the potential for entry and decide that they are better off with mutual forbearance. For example, suppose gatekeeper X has core platform service A designated under the DMA, while gatekeeper Y has core platform service B.

If gatekeeper X aggressively enters or expands a business to compete with B, it may trigger a response from gatekeeper Y in core platform service A, where it may choose to enter or make increased investments. The resulting intensified competition in both CPS A and B could lower overall profits for both gatekeepers.

This, of course, is exactly what the DMA is supposed to do. There are many possible entrants of this type: Meta in e-commerce and app stores; Amazon in app stores and handset design; Microsoft in search and app stores; Google in e-commerce; Apple in search and digital advertising.

These potential entrants or smaller rivals may not wish to raise the competitive intensity of their interactions with other gatekeepers, but rather continue to 'stay in their lanes.'

## 7 Possible solutions

There is not much time to improve enforcement before the deadline. The DMA may simply have been designed in a way that requires several years of iteration before consumers can expect to see the effective opening-up of gatekeeper platforms and increased innovation.

However, the Commission should do whatever it can under current law to protect business users who engage in the regulatory process. For example, the Commission might avoid reporting to the gatekeeper concerned complaints from named business users, but might find alternative methods to provide legal security to both sides.

The Commission should also make clear the extent of business user protections so that business users are not harmed by choosing to engage, as such experiences will reduce engagement from other business users.

If legal obligations need to be tightened up in order to effectively protect business users under the DMA, the Commission should not hesitate to do so using the power to adopt delegated acts that it is granted under Arts. 12 and 49 DMA.

The DMA prohibits retaliation by gatekeepers against business users under Article 5(6) (and further explained in Recital 102). It would be helpful for the Commission to explain how it plans to enforce in this area, perhaps clarifying how the regulation applies depending on the geographic location of the retaliation.

An interesting topic to spell out is how, if retaliation constitutes noncompliance with the DMA, a gatekeeper engaging in it would add to its count of violations and contribute to a finding of systematic noncompliance. Under Article 18, this can result in structural remedies, such as divestiture, being applied to the gatekeeper.

Other solutions to the chicken-and-egg problem might include requirements around timeliness of gatekeeper responses to requests for interoperability specifications and subsequent access. If needed, these requirements could lay out step-by-step procedures on engagement between gatekeepers and business users.

Additionally, the Commission could require gatekeepers to set out publicly any security review process required for business users, its costs and timeline. Gatekeepers should also post information of interest to potential entrants, such as how features like 'auto-updating' will be handled.

Speeches by Commission officials and national competition authorities explaining the role of business users and the protections afforded them, might assist in reducing information asymmetry with business users in relation to how all these processes will work.

In particular, national competition authorities are naturally better connected to their local business communities and could engage in outreach to existing business users and entrepreneurs in their member states.

Lastly, industry associations might be able to help potential business users join together to express concerns and develop technical suggestions for the gatekeeper that are broader and more robust than any of them could make alone.

Such organisations might be more effective in conveying the concerns of their members to the Commission, while enabling anonymity and creating economies of scale for smaller business users. ■

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## Endnotes

1. For example, the UK Competition and Markets Authority provides a process description in some instances; see CMA (2022), page 40.
2. For a practitioner perspective, see Dannemiller et al (2017).
3. See '[Template form for reporting pursuant to Article 11 of Regulation \(EU\) 2022/1925](#)', European Commission, 9 October 2023.

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# Adapting the EU AI Act to deal with generative AI

Generative AI might hold enormous promise. The EU's draft AI Act already needs to be revised to account for the opportunities and harms of generative AI, J Scott Marcus argues

**W**hen the European Commission in April 2021 proposed an AI Act to establish harmonised EU-wide harmonised rules for artificial intelligence, the draft law might have seemed appropriate for the state of the art. But it did not anticipate OpenAI's release of the ChatGPT chatbot, which has demonstrated that AI can generate text at a level similar to what humans can achieve. ChatGPT is perhaps the best-known example of generative AI, which can be used to create texts, images, videos and other content.

Generative AI might hold enormous promise, but its risks have also been flagged up<sup>1</sup>. These include (1) sophisticated disinformation (eg. deep fakes or fake news) that could manipulate public opinion, (2) intentional exploitation of minorities and vulnerable groups, (3) historical and other biases in the data used to train generative AI models that replicate stereotypes and could lead to output such as hate speech, (4) encouraging the user to perform harmful or self-harming activities, (5) job losses in certain sectors where AI could replace humans, (6) 'hallucinations' or false replies, which generative AI can articulate very convincingly, (7) huge computing demands and high energy use, (8) misuse by organised crime or terrorist groups, and finally, (9) the use of copyrighted content as training data without payment of royalties.

To address those potential harms, it will be necessary to come to terms with the foundation models that underlie generative AI. Foundation models, or models through which machines learn from data, are typically trained on vast quantities of unlabelled data, from which they infer patterns without human supervision. This unsupervised learning enables foundation models to exhibit capabilities beyond those originally envisioned by their developers (often referred to as 'emergent capabilities').

### **The evolving AI Act**

The proposed AI Act (European Commission, 2021), which at time of writing is still to be finalised between the EU institutions<sup>2</sup>, is a poor fit for foundation models. It is structured around the idea that each AI application can be allocated to a risk category based on its intended use.

This structure largely reflects traditional EU product liability legislation, in which a product has a single, well-defined purpose. Foundation models however can easily be customised to a great many potential uses, each of which has its own risk characteristics.

In the ongoing legislative work to amend the text, the European Parliament has proposed that providers of foundation models perform basic due diligence on their offerings. In particular, this should include:

*The EU is likely to be a major deployer of generative AI. This market power may help ensure that the technology evolves in ways that accord with EU values*

**Risk identification.** Even though it is not possible to identify in advance all potential use cases of a foundation model, providers are typically aware of certain vectors of risk. OpenAI knew, for instance, that the training dataset for GPT-4 featured certain language biases because over 60 percent of all websites are in English. The European Parliament would make it mandatory to identify and mitigate reasonably foreseeable risks, in this case inaccuracy and discrimination, with the support of independent experts.

**Testing.** Providers should seek to ensure that foundation models achieve appropriate levels of performance, predictability, interpretability, safety and cybersecurity. Since the foundation model functions as a building block for many downstream AI systems, it should meet certain minimum standards.

**Documentation.** Providers of foundation models would be required to provide substantial documentation and intelligible usage instructions. This is essential not only to help downstream AI system providers better understand what exactly they are refining or fine-tuning, but also to enable them to comply with any regulatory requirements.

### Room for improvement

These new obligations, if adopted in the final AI Act, would be positive steps, but lack detail and clarity, and would consequently rely heavily on harmonised standards, benchmarking and guidelines from the European Commission. They also risk being excessively burdensome. A number of further modifications could be put in place.

### Risk-based approach

Applying all obligations to the full extent to every foundation model provider, both large and small, is unnecessary. It might impede innovation and would consolidate the market dominance of firms that already have a considerable lead in FMs, including OpenAI, Anthropic and Google Deepmind<sup>3</sup>. Even without additional regulatory burdens,

it might be very hard for any companies outside of this group to match the resources and catch up with the FM market leaders.

A distinction could therefore be made between systemically important and non-systemically important FMs, with significantly lower burdens for the latter. This would be in line with the approach taken by the EU Digital Services Act (DSA), which notes that *"it is important that the due diligence obligations are adapted to the type, size and nature of the ... service concerned."*

The DSA imposes much more stringent obligations on certain service providers than on others, notably by singling out very large online platforms (VLOPs) and very large online search engines (VLOEs).

There are two reasons for differentiating between systemic and non-systemic foundation models and only imposing the full weight of mandatory obligations on the former. First, the firms developing systemic foundation models (SFMs) will tend to be larger, and better able to afford the cost of intense regulatory compliance. Second, the damage caused by any deviation by a small firm with a small number of customers will tend to be far less than that potentially caused by an SFM.

There are useful hints in the literature (Bommasani *et al* 2023; Zenner, 2023) as to criteria that might be used to identify SFMs, such as the data sources used, or the computing resources required to initially train the model. These will be known in advance, as will the amount of money invested in the FM.

These pre-market parameters presumably correlate somewhat with the future systemic importance of a particular FM and will likely also correlate with the ability of the provider to invest in regulatory compliance. The degree to which an FM provider employs techniques that facilitate third-party access to their foundation models and thus

independent verification, such as the use of open APIs, or open source, or (especially for firms that do not publish their source code) review of the code by independent, vetted experts, might also be taken into account.

Other, post-deployment parameters, including the number of downloads, or use in downstream services or revenues, can only be identified after the product has established itself in the market.

### **Lesser burdens**

Notwithstanding the arguments for a risk-based approach, even small firms might produce FMs that work their way into applications and products that reflect high-risk uses of AI. The principles of risk identification, testing and documentation should therefore apply to all FM providers, including non-systemic foundation models, but the rigour of testing and verification should be different.

Guidance, perhaps from the European Commission, could identify what these reduced testing and verification procedures should be for firms that develop non-systemic foundation models. Obligations for testing, analysis, review and independent verification could be much less burdensome and intensive (but not less than reasonably stringent) for providers of non-systemic FMs.

This kind of differentiation would allow for a more gradual and dynamic regulatory approach to foundation models. The list of SFMs could be adjusted as the market develops. The Commission could also remove models from the list if they no longer qualify as SFMs.

### **Use of data subject to copyright**

Even though the 2019 EU Copyright Directive provides an exception from copyright for text and data mining (Article 4(1) of Directive 2019/790), which would appear in principle to permit the use of copyrighted material for training of FMs, this provision does not appear in practice to have resolved the issue.

The AI Act should amend the Copyright Directive to clarify the permitted uses of copyrighted content for training FMs, and the conditions under which royalties must be paid.

### Third-party oversight

The question of third-party oversight is tricky for the regulation of FMs. Is an internal quality management system sufficient? Or do increasingly capable foundation models pose such a great systemic risk that pre-market auditing and post-deployment evaluations by external experts are necessary (with protection for trade secrets)?

Given the scarcity of experts, it will be important to leverage the work of researchers and civil society to identify risks and ensure conformity. A mandatory SFM incident reporting procedure that could draw on an AI incident reporting framework under development at the Organisation for Economic Co-operation and Development<sup>4</sup> might be a good alternative.

### Internationally agreed frameworks

Internationally agreed frameworks, technical standards and benchmarks will be needed to identify SFMs. They could also help document their environmental impacts.

Until now, the development of large-scale FMs has demanded enormous amounts of electricity and has the potential to create a large carbon footprint (depending on how the energy is sourced). Common indicators would allow for comparability, helping improve energy efficiency throughout the lifecycle of an SFM.

### Safety and security

Providers of SFMs should be obliged to invest heavily in safety and security. Cyberattacks on cutting-edge AI research laboratories pose a major risk; nonetheless, and despite rapidly growing investments in SFMs, the funding for research in AI guardrails and AI alignment is still rather low.

The internal safety of SFMs is crucial to prevent harmful outputs. External security is essential, but it alone will not be sufficient – the possibility of bribes in return for access to models should be reduced as much as possible.

### **Conclusion**

The EU is likely to be a major deployer of generative AI. This market power may help ensure that the technology evolves in ways that accord with EU values.

The AI Act is potentially ground-breaking but more precision is needed to manage the risks of FMs while not impeding innovation by smaller competitors, especially those in the EU. Unless these issues are taken into account in the finalisation of the AI Act, there is a risk of significantly handicapping the EU's own AI developers while failing to install the adequate safeguards. ■

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## Endnotes

1. See for example Bender et al, 2021; Bommasani et al 2021; OECD, 2023.
2. See <https://www.europarl.europa.eu/legislative-train/theme-a-europe-fit-for-the-digital-age/file-regulation-on-artificial-intelligence>.
3. On competition issues raised by foundation models, see Carugati (2023).
4. See <https://oecd.ai/en/network-of-experts/working-group/10836>.

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