

WORLD COMMERCE REVIEW

SPRING 2024

IN A Q&A JOSEPHINE
GEORGE DISCUSSES THE
BANK OF ST HELENA'S USE
OF NEW TECHNOLOGY

PATRICK VAN SCHIE
PROVIDES AN INSIGHT
INTO THE RECENT DUTCH
GENERAL ELECTION

DANIEL DAIANU ASKS IF AI
CAN ADDRESS IMBALANCES
BETWEEN NEEDS AND
RESOURCES

THE GLOBAL TRADE AND FINANCE PLATFORM

FOREWORD

Taking stock

The euro is 25 years old. It is a good time to look at the changes in Europe in that time and to look at what is happening elsewhere. Europe has become a global leader in social protection, combatting climate change and sees itself as the guardian of free trade and democracy. However, these achievements are under threat. At the time of the millennium Europe was optimistic about the coming century. Now European companies are falling behind. They are investing less in the future and are less productive.

In 2023 Europe's largest companies are similar to those in 1999 (Shell, Total, BP, VW, Glencore). Contrast that to the United States where behemoths such as Apple, Amazon, Facebook, Alphabet and Nvidia are now dominating. China has seen companies such as Tencent and Alibaba emerge. Europe lost the information technology revolution.

Now we are seeing new technologies (AI, blockchain, energy storage, robotics) coming to the fore. What happens if these new technologies are truly disruptive and transformative? Are there any European companies at the leading edge?

Who leads the transition? Companies need security if they are to invest billions into new technologies. Many companies want the state to choose a direction so that they can plan and adjust their investments accordingly.

Ideally, the state would also spend a lot of money to support emerging technologies, providing some carrots to companies instead of only sticks. But the EU lacks the central fiscal capacity to provide such carrots and member states are either constrained by state aid rules or, if these are temporarily relaxed, by the fiscal rules that require balanced public budgets.

The EU's economic policy of the past few years is a story of attempts to adjust its policies to the requirements of the real world within the rigid framework of the EU treaties. But as long as this framework remains in place, the EU will keep undermining its security, economic growth, and democracy.

Europe has stagnated on many fronts since 2000 - anaemic growth, a plummeting birth rate, military disinvestment - from which countries such as Belgium and Germany have still not emerged. Perhaps most worrying of all, according to criteria such as patents, capital investment, and stock market giants mentioned previously, it has stopped innovating.

It lacks the flexibility to respond to geopolitical events. The machinery of the European Union and its obsessions has seen it impose constraints, punishments and taxes. It appears that stagnation is a problem from which Europe might have the greatest difficulty in freeing itself. ■

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A tale of two treatises

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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

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The payments system is being transformed. Piero Cipollone argues that central banks need to be at the vanguard of digital transformation to ensure financial stability

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Can AI change economic logic and bring abundance for all?

Daniel Daianu asks if AI can address imbalances between needs and resources sustainably by bringing about abundance for all?

Debates on artificial intelligence (AI) have intensified greatly in recent years. The British government organized a high-level conference on this topic recently. Top officials from the EU and the USA consider AI among their priority policy orientations. Prominent Silicon Valley voices, major companies, are actively engaged in this debate.

In Asia, AI is at the forefront of attention. At last year's annual meeting of the *Academia Europaea*, Professor Helga Nowotny's inaugural address and other lectures focused on AI. While the benefits of AI are widely acknowledged, deep concerns about its potentially harmful effects and the possibility of it spiralling out of control are also raised.

Can AI be regulated without stifling innovation? Could AI address imbalances between needs and resources sustainably by bringing about abundance for all? This debate is particularly relevant given the significant disruptions of recent years, that have perturbed people's lives and have led to a 'cost of living' crisis with political ramifications.

Is it justified to speak about an abundance of goods and services in society? This question is to be judged given that, in the traditional sense, economics examines the dynamics of needs (both individual and collective) in relation to available resources.

Markets regulate the relationship between demand and supply of goods and services through 'equilibrium prices' – which are influenced by imbalances that depend on business cycles, shocks that disrupt supply chains, and policies that foster unsustainable consumption.

However, 'equilibrium prices' can conceal significant disparities in incomes, purchasing power, and assets of individuals, in the distribution of economic/financial power in markets. These asymmetries can heavily impact (through more or less obvious interest groups) political life – which can also imply the capture of public decisions.

States of apparent equilibrium can be precarious, highly fragile. Hence, public policies have over time emerged, that seek to ensure, in societies that value moral and equity related criteria, equal opportunities and that attempt to avoid/alleviate large-scale economic and social distress.

Antitrust legislation originates from this concern, as does the system of separation of powers (in democracies), regulations aimed at preventing blatant power abuses in economic and political life, including the over-financialization of economies.

AI cannot eliminate competitiveness gaps between economies on its own. It is hard to accept that AI would spread globally in a way that eliminates development disparities

It is not coincidental that there is an ongoing conversation about the need to make the economy work for the benefit of as many citizens as possible (see also Robert Reich, *Saving Capitalism for the Many, Not the Very Few*, 2016; Martin Wolf, *The Crisis of Democratic Capitalism*, 2023).

There are also imbalances between economies, which are illustrated by different trade balances that express competitiveness gaps.

Economics has long been dubbed the dismal science, a term dating back to the 19th century in the controversial writings of Thomas Carlyle and the thoughts of Thomas Malthus on available resources in relation to population dynamics – a theme revived by the Club of Rome about half a century ago and by the Stern Review in 2007.

Nicholas Georgescu-Roegen, a prominent economist originally from Romania, also delved into the issues surrounding the relationship between economic dynamics and resources. Climate change has heightened concerns regarding the connection between resources and human needs.

Reservations about this terminology may stem from the perception that it is overly pessimistic, that it is inappropriate to compare current scientific and technological progress, the development of artificial intelligence, with the 19th century industrial revolution, and that that century is vastly different from the contemporary world, which has lifted hundreds of millions of people outside of Europe and North America from abject poverty.

I refer particularly to Asia here. Moreover, the range of goods and services in today's world is different from, let's say, that of over 100 years ago (not to mention differences in quality).

On the other hand, feelings and aspirations, joys and concerns have their roots in the real lives of people, in their social, economic, and cultural connections, in how public authorities respond to basic public needs – these, in turn,

stemming from concrete life situations. At the same time, individuals and groups use collective benchmarks and personal preferences to articulate specific desires and requests.

It must be noted that new technologies do not improve people's living standards automatically and equally. For example, smartphones can provide access to information for numerous citizens but do not ensure access to civilization and equal opportunities for everyone.

In Africa, for instance, over three-quarters of the continent's population use mobile phones, yet economic progress is generally very limited, and poverty is endemic. Moreover, the COVID-19 pandemic and climate change, the latter seen as an existential threat, bring attention to the possibility of dystopian worlds.

Martin Weitzman, with his *Dismal Theorem* (2011), outlines a scenario in which we might not have the resources (technological capacity) to avoid extreme changes in the environment (because we would need to allocate more and more of our present resources to save future generations – a very difficult trade-off for most people to accept).

Referring to the historian Karl Wittfogel, I have spoken about the spectre of 'hydraulic societies' if the adverse effects of climate change are not effectively addressed (Hotnews, March 18, 2021). The issue of intergenerational resource distribution is very hard to deal with and climate change exacerbates it. Be it so however, it should not lead to the conclusion that nothing can be done, that every person should think about him/her only. In public policies, decisions are made even under extreme uncertainties, duress, based on cost-benefit assessments that may be highly approximate.

Artificial intelligence, beyond its undeniable benefits, is viewed by not a few specialists as an existential threat in the sense that it could surpass the cognitive and inventive abilities of humans. Consequently, AI could potentially dominate humans and pose a threat to their existence.

AI is also seen as a means to amplify military capabilities (see Steven Feldstein, [*AI in war: can advanced military technologies be tamed before it is too late?*](#) Bulletin of the Atomic Scientists, January 11, 2024). An analogy can be drawn here with nuclear energy and the proliferation of atomic weapons.

Therefore, there are increasing calls for the regulation of AI usage. Whether this can be achieved in an increasingly fragmented, multipolar world, with intense geopolitical rivalries is a more than legitimate question. Nevertheless, it must be attempted. Just as it is necessary to do in combating pandemics.

The health crisis, along with partial lockdowns during the pandemic, has highlighted the ability of many companies and public entities to function with a significant reduction in the number of employees. Recently, the IMF pointed out that over 40% of occupations (60% in economically advanced countries) will be affected by AI in the future, leading to massive job losses.

Remote work, digitization, new technologies in general, and the increasing use of AI imply significant changes in the operations of many firms, leaving their mark on the future structure of the labour market.

This impact should be viewed in the context of a large number of losers due to unrestricted globalization in recent decades. Not coincidentally, there is a rethinking of globalization, a regionalization of cross-border economic relations, and an increase in protectionist measures – strengthened by geopolitical and military security considerations, by the need to enhance resilience.

Numerous layoffs will exacerbate social problems and structural unemployment. This is why the introduction of a guaranteed minimum wage is considered by some analysts as a means to prevent social tensions from reaching extremes.

Financing a guaranteed minimum income could be achieved through a tax on robots (as advocated), leading to a redistribution of income from those using robotics (and replacing humans) to those who lose their jobs; the more automated and profitable a business is, the more it would be taxed in absolute terms.

Such ideas are understandable if we strive to avoid the situation where many people become desperate, leading to severe social anomalies. The issue of moral hazard loses significance in such a reasoning. However, the question of 'honourable' work as a characteristic of human dignity (it is said honourable because enslaving work dishonours and humiliates) remains unresolved.

This is so since work undergirds an ethos of education, self-respect, and contributes to societal cohesion. These may be lofty words, but they are not without merit. Would artificial intelligence (AI) alter the logic of economic life towards a presumed abundance of goods and services?

This question recalls the vision of John Maynard Keynes about a century ago when he foresaw an era of abundance 'for our grandchildren' (*Economic possibilities for our grandchildren*, in *Essays in Persuasion*, London, 1930), based on continuous technological progress. However, this vision has been questioned by many economists.

It is worth noting that behavioural economics has brought nuanced insights into how people make decisions, with variables such as affection, satisfaction, self-fulfilment, simple rules, emotions, empathy, loyalty, altruism, individual and group identities being relevant factors.

However, the acquisitive nature of human beings (which defines the Homo Economicus, not in contradiction with the Homo Faber) is essentially unaltered by such behavioural nuances. In similar conditions, most people choose

to possess more rather than less, often manifesting selfishness; they are not like Franciscan monks, even though ethical and moral values operate in society.

This is why it is so hard to alter the logic, the rationality of economic activity (maximizing net income/profit under given conditions). Markets struggle to internalize externalities that people do not easily perceive or are obliged in some way to consider (such as Pigovian taxes designed to discourage harmful activities).

The sometimes negligible cost of 'informational goods' (Paul Mason, *Post-capitalism: A guide to our future*, 2015) does not change the nature of competition and the effects of economic inequality. Moreover, and not least, people need to eat and have access to clean water.

The acquisitive nature of humans reveals specific traits when identity issues, group dynamics, and the desire for power come into play. Conflicts between people (groups of people, states), including military conflicts, can be interpreted through the lens of the desire to have/control resources that ensure individual and group security and power.

The rule of law must operate within societies and in the international arena. International law is meant to regulate relations between states and, in this regard, to safeguard peace. However, we see so many misfortunes and tragedies miseries occurring in the world we live in. Though, it could be remarked that human history is littered with misfortunes, both large and small. Such an observation, however, cannot provide solace and is even cynical.

It is not simple to redefine wellbeing in statistical and accounting terms; markets are accustomed to aggregates of economic activity that tend to grow, even if macroeconomic adjustments are required due to excessive deficits debt stocks. All of this leads to the inference that markets, performance evaluation algorithms, do not (yet?) accept

lower production and consumption trends, even though such a reversal could entail saving the human species and creating a friendly habitat.

There is a market myopia here when judged broadly (that is supported by evaluations from rating agencies and financial institutions, as well as from many firms and governments).

AI cannot eliminate competitiveness gaps between economies on its own. It is hard to accept that AI would spread globally in a way that eliminates development disparities. On the contrary, AI could potentially widen such gaps and accentuate inequalities within societies.

The strength of inventiveness and innovation varies significantly between countries and depends on the level of education, technological capabilities, expenditures on research and development (R&D), the existence of companies excelling in cutting-edge fields, and more.

AI also cannot reduce public and private deficits, excessive public and private debts, like a wizard; macroeconomic corrections are needed to work toward these goals.

Therefore, it is difficult to see AI as a way out of economic logic, of economic rationality (in the sense we know), as heralding an era of abundance for all human beings; issues of competition, distribution, and inequalities (with social and political effects stemming from them), power seen on multiple levels, will continue to define human interactions and relations between states. Development disparities between economies will persist.

Various scenarios speak of increasing uncertainties, fragmentation, the erosion of social fabric, and deep divisions in societies, the proliferation of military conflicts, an increasingly militarized and dangerous world; such scenarios amplify the ratio of pessimism regarding the future.

A world that allocates more resources to weapons and leans more towards military confrontation while facing enormous challenges related to climate, public health, education, the cost of living, is heading in the wrong direction; it is a path conducive to authoritarian regimes, autocracy.

Looking at the overall context from an economic and political perspective, one could say by using a French aphorism that *“plus ça change, plus c’est la même chose”* (the more things seem to change, the more they stay the same). This last inference does not mean that we should stop thinking that the world can be better, that we should not try to make it better, or at least try to stop negative developments from progressing further. ■

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PS. Although I reacted hot-tempered to Costica Bradatan's opinion Democracy is only for the Gods (New York Times, July 5, 2019), in Democracy is not only for the gods (Hotnews and Contributors, February 8, 2020), what is happening in the world seems to largely support his thesis.

The role of fiscal policy

The global economy has seen a major financial crisis and a worldwide pandemic. Patrick Minford reviews the attempts to model these events and suggests policy conclusions

Recently estimated models of major economies, which have been extended to allow for banking, the zero lower bound on interest rates (ZLB), and varying pricing strategies, can account well for recent macroeconomic behaviour. These models imply that active fiscal policy can contribute to macroeconomic stability and welfare by reducing the frequency of hitting the ZLB. Fiscal policy can also share the stabilisation role with monetary policy, whose effectiveness under the ZLB is much reduced.

1. Introduction: recent empirical evaluations of macro models and the implications for macro policy

Recent decades have seen a major financial crisis and a worldwide pandemic, together with large-scale responses from fiscal and monetary policy. A variety of attempts have been made to model these events and policy responses empirically.

In this piece I review these modelling attempts and suggest some policy conclusions. I will argue that a new class of models in which there is price-setting but for varying lengths of time can account for the shifts in macro behaviour from pre-crisis times up to the present day; these models also prescribe a key role for fiscal policy - ie. the deliberate use of public sector surplus or deficit - in stabilising the economy and preventing its slide into the zero lower bound.

This implies that fiscal rules should limit debt in the long term and not stymie fiscal policy, as happens with many short term fiscal rules now in use, such as in the UK and the EU.

Since the crisis, a number of economists have argued for a more central role for fiscal policy, given the enfeeblement of monetary policy with interest rates at the zero lower bound (ZLB). Prominent advocates of stronger fiscal stimulus for economies battling low inflation and weak demand have included Romer, Stiglitz, and Solow in Blanchard *et al* (2012); also Spilimbergo *et al* (2008), Lane (2010), though with opposition from Alesina and Giavazzi (2013).

This viewpoint has seemed highly persuasive on broad qualitative grounds. However, credible quantitative assessments of the role and effects of fiscal policy have been harder to find. This is what I attempt to do in this article, drawing on recent models that can claim to match data behaviour rather accurately.

We have found that DSGE models based on New Keynesian principles extended to allow for banking, the ZLB and varying price duration can account well for recent macro behaviour across a variety of economies, whether large and approximately closed like the US or small and open like the UK

2. Models and their empirical evaluation

In the past three decades, since the rational expectations revolution and the understanding of how ubiquitous were its implications, economists have rebuilt macro-economic models to ensure that they had good micro-foundations - that is to say, their assumptions were based on the actions of households and firms to meet their objectives, using rational expectations (ie. evaluating their prospects using available information intelligently).

These models assume simplified set-ups where consumers maximise stylised utility functions and firms maximise stylised profit functions. Most models assume representative agents; more recently they assume heterogeneous agents to deal with such issues as inequality and growth.

Much effort has been devoted to making these set-ups as realistic as possible and calibrating the resulting models with parameters that have been estimated on micro datasets. The models are usually labelled as 'Dynamic Stochastic General Equilibrium' (DSGE) models since they aim to capture how shocks affect people's dynamic behaviour in market equilibrium.

Sometimes it has seemed as if the economists creating these models have assumed this 'micro realism' was enough to create a good macro model; and that therefore we should treat their models as simulating the true behaviour of the economy.

However, a moment's reflection reveals such assumptions to be self-deluding. Even the most realistic set-ups require bold simplifications simply to be tractable; they are after all models and not the 'real world'. Furthermore, these models are intended to capture aggregate behaviour and there is a great distance between aggregated behaviour and the micro behaviour of individuals; even heterogeneous agent models do not accurately span the variety of individual types and shock distributions.

The reasons for this gap between aggregated behaviour and the micro behaviour of individuals are manifold. One is the fairly obvious one that aggregate actions are the weighted sum of individual actions, yet we cannot be sure of the weights, which themselves may change over time and across different shocks.

Effectively we choose one constant set of weights but we need to check its accuracy. Another less obvious but important reason is that there are a host of ancillary market institutions whose function is to improve the effectiveness of individual strategies by sharing information; these include investment funds, banks and a variety of other financial intermediaries, whose activities are not usually modelled separately but whose contribution is found in the higher efficiency of those strategies.

Hence empirical work is needed to check whether these models do capture macroeconomic behaviour. It would be reassuring if well micro-founded models mimicked actual data behaviour. Then we would know that the simplification is not excessive and the aggregation problems have been conquered.

More broadly macro-economic modelling remains highly controversial even among 'mainstream' macroeconomists on empirical grounds: for example, Romer (2016) has argued that these DSGE models are useless for basing advice to policymakers because they fail to capture key aspects of macro behaviour.

To settle such debates we need a tough empirical testing strategy, with strong power to discriminate between models that fit the data behaviour and those that do not. The merits of different testing methods have been reviewed in Le *et al* (2016) and Meenagh *et al* (2019, 2023).

In this paper we review what we know about the empirical success of different models. We restrict ourselves to DSGE models because these are the only causal macro models we have that satisfy the requirements that people obey rational expectations.

We consider the results of empirical tests for DSGE models of the economy. Inevitably, given its size and influence, our main focus is on models of the US economy. However, we also review results for other large economies, viewed similarly as large and effectively closed.

We also review models of various open economies, such as the UK and regions of the Eurozone. What we will see is a general tendency for fiscal policy to make an important stabilising contribution according to these models.

We need a testing method that has enough power to discriminate between the models that succeed and the models that should be discarded. The method we propose is 'Indirect Inference' where a model is simulated in repeated samples created from historical shocks by a random selection process known as 'bootstrapping'; this simulated behaviour is then compared with the actual behaviour we observe in the historical data, to see how closely it matches it - the model is rejected if the match is poor.

The procedure first finds a suitable way to describe the data behaviour; suitable in the sense that this behaviour is relevant to and revealing of the model's accuracy. Usually we will use the 'time-series' behaviour of the data, that is a relationship between the data and its lagged values.

The most general such relation is a 'Vector Auto Regression', or VAR, where all the data variables are related to the past values of all of them. In practice we generally use three such variables, such as output, inflation and interest rates which are central to the economy's behaviour.

As explained in Le *et al* (2016) and Meenagh *et al* (2019, 2023) cited above, the power of this test is extremely high, and for this reason the test needs to be used at a suitable level of power where it is efficiently traded off against tractability. Too much power will mean the rejection of all good models; while weak power gives much too wide bounds on the accuracy of the model which is what we want to assess.

In using these tests, we have found that a three-variable VAR is about right for getting the right amount of power for the test. We use this in the tests we report in what follows.

3. DSGE models of the US economy

The most widely used DSGE model today is the New Keynesian model of the US constructed by Christiano, Eichenbaum and Evans (2005) and estimated by Bayesian methods by Smets and Wouters (2007). This model and the US data it is focused on makes a good starting point for our model evaluations.

In this model the US is treated as a closed continental economy. In essence it is a standard model of general market equilibrium (ie. where all markets clear) but with the addition of sticky wages and prices so that there is scope for monetary policy feedback to affect the real economy- this last being the 'New Keynesian' addition. Smets and Wouters found that their estimated model passed some forecasting accuracy tests when compared to unrestricted VAR models.

Le *et al* (2011) applied indirect inference testing to the Smets-Wouters model, first investigating their New Keynesian version and then also investigating a New Classical version with no rigidity. They rejected both on the full post-war sample used by Smets and Wouters, using a three-variable VAR1 (output, inflation and interest rates, with only one lag). They concluded that this model of the US post-war economy, popular as it was in major policy circles, must be regarded as strongly rejected by the appropriate 3-variable test.

They then found that there were two highly significant break points in the sample, in the mid-1960s and the mid-1980s. They also argued that there are parts of the economy where prices and wages are flexible and it therefore should improve the match to the data if this is included in a 'hybrid' model that recognises the existence of sectors with differing price rigidity (Dixon and Kara, 2011, is similar, with disaggregation).

Finally, after estimation by indirect inference they found a version of this hybrid model that matched the data from the mid-1980s until 2004, known as 'the great moderation'; no such version (or any version) could match the earlier two sub-samples. The later sample showed very low shares for the 'flexible sectors'.

However, when it was extended to include the period of financial crisis up to 2012, these shares rose dramatically and became dominant. The high rigidity of the great moderation period seems to have reflected the lack of large shocks and the low inflation rate of that period; once the shocks of the financial crisis hit, with sharp effects on inflation, this 'rigidity' mostly disappears. Nevertheless there is normally some rigidity.

A DSGE model in which rigidity is shock-size-dependent is non-linear. We have the tools to solve such models. Since the financial crisis there has also been the arrival of the zero bound on interest rates and the use of Quantitative Easing (QE, aggressive purchase of bonds for money by the central bank) under the zero bound.

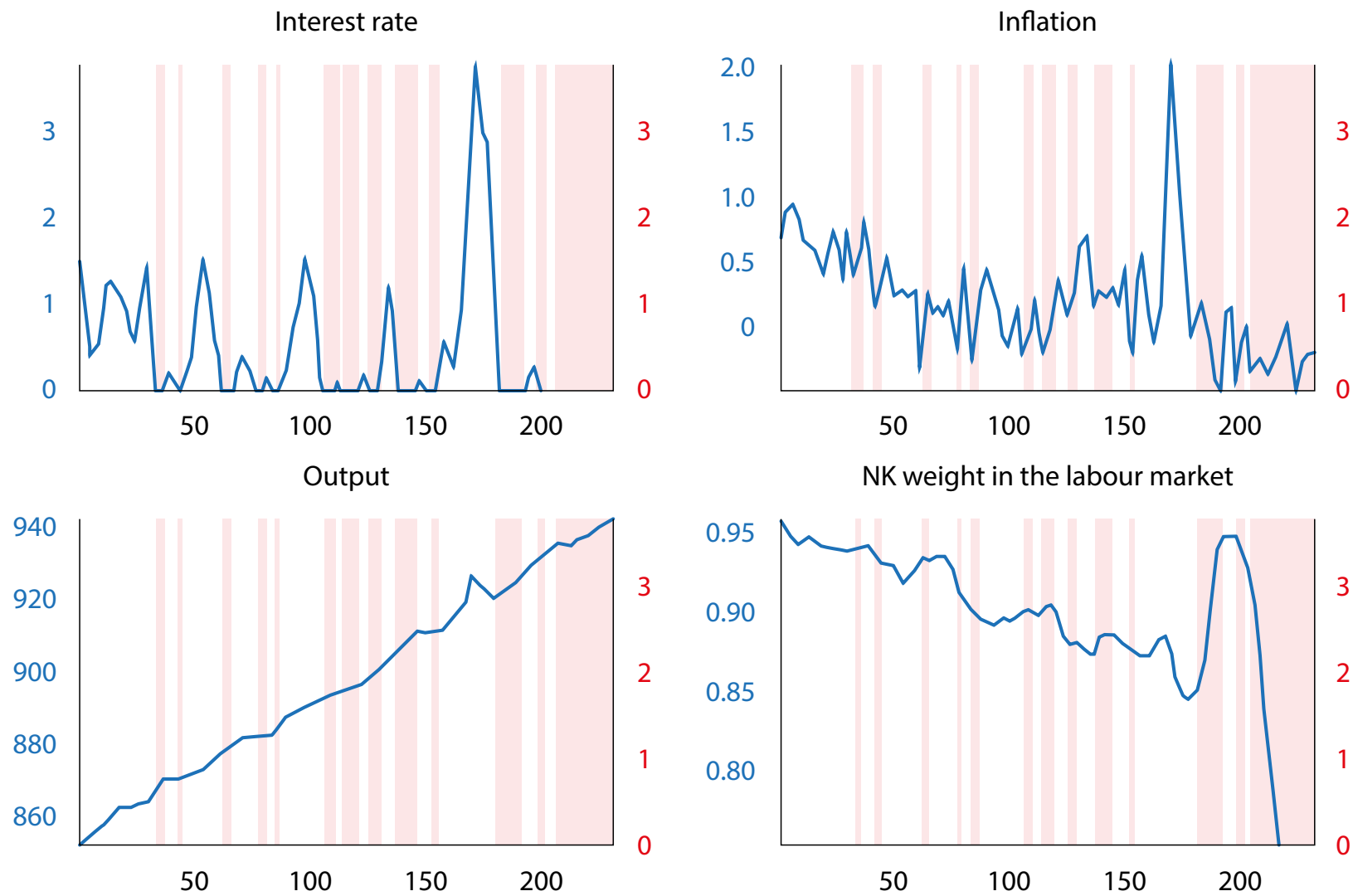
Le *et al* (2021) estimated such a model, complete with a banking sector and a collateral constraint that made narrow money creation effective by cheapening collateral. They found that this model finally could match the data behaviour over the whole post-war sample; in effect the shifts in regime due to the interaction of the ZLB with inflation and so with the extent of price rigidity manage to mimic the changing data behaviour closely.

However, they found that this interaction of the ZLB and price rigidity created considerable inflation variability, as the ZLB weakened the stabilising power of monetary policy on prices and this extra inflation variance in turn reduced price rigidity, further feeding inflation variance.

This process is illustrated in Figure 1, a simulation (no 15) of the model in which the ZLB is repeatedly hit (the shaded areas), with both inflation and interest rates gyrating sharply, and both output and the share of the relatively rigid-price sector (the NK weight) responding.

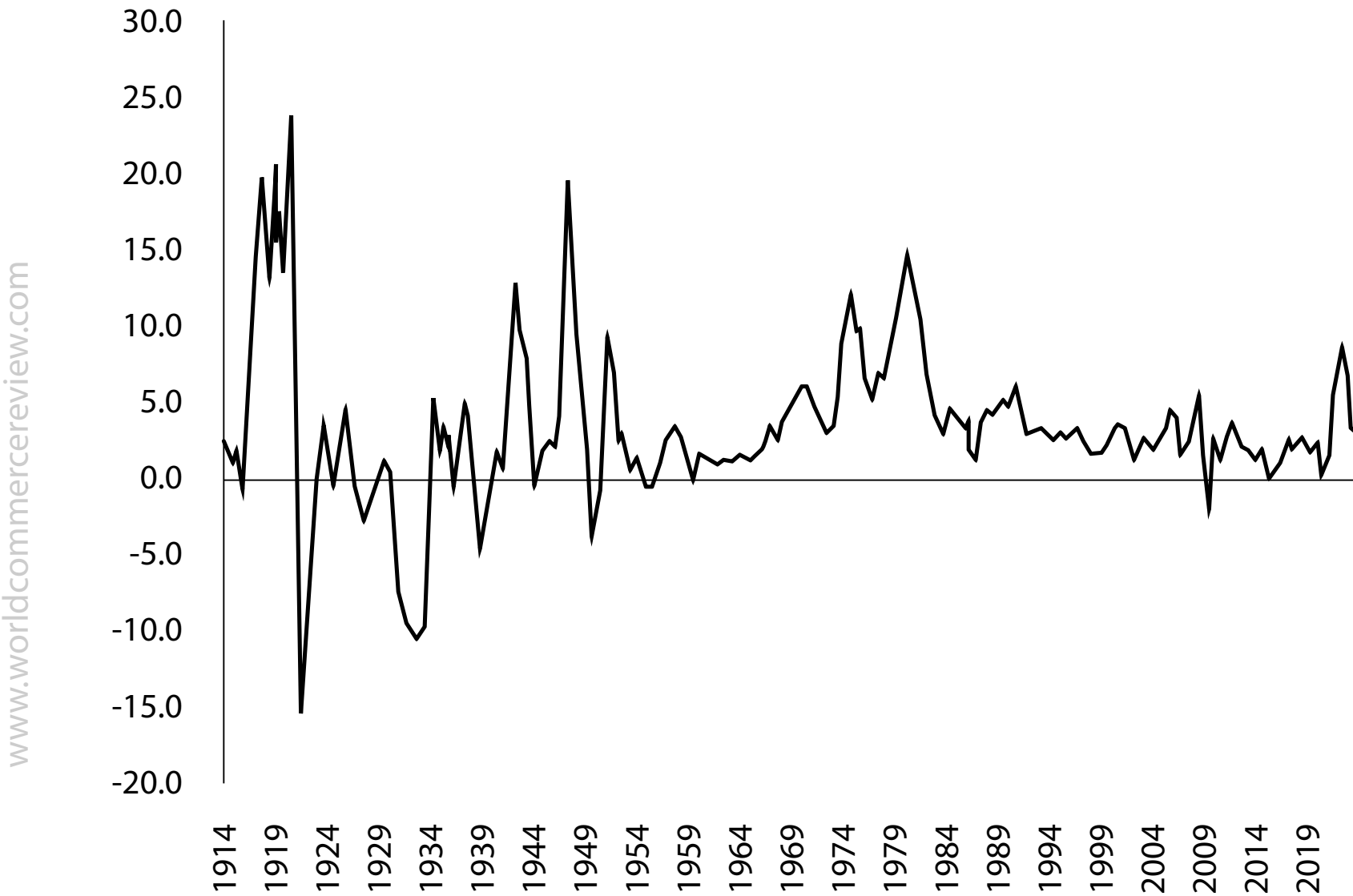
Figure 1. Bootstrap simulation (all shocks) of US model

Simulation 15



Source: Le, Meenagh and Minford (2021).

Figure 2. US inflation for all urban consumers



Source: St Louis Fed

In this prediction of soaring inflation variance after the onset of the zero bound, this model has proved eerily correct - as the chart in Figure 2 of US inflation testifies. After going negative in 2010 and then settling at low rates initially in the 2010s, in 2023 inflation leapt upwards in a way reminiscent of the 1970s, in turn forcefully ending the ZLB with the sharp interest rate response currently playing out.

To cut into this inflation variance feedback loop, Le *et al* (2021) found that there were benefits from both new monetary rules and from stronger fiscal feedback rules. Specifically, they found that substituting a Price Level (or Nominal GDP - NOMGDPT) target for an inflation target in the interest-rate-setting rule could greatly increase stability - because a levels target requires much more persistent interest rate changes which are anticipated by agents, thus giving much more 'forward guidance'.

They further found that fiscal policy has an important role to play in keeping the economy away from the ZLB; with a strongly stabilising fiscal policy that acts directly to prevent the ZLB occurring they found a big increase in both output and inflation stability.

4. Work on other economies

Work on the UK found that a similar model fitted UK data behaviour before and after the financial crisis, from 1986 to 2016 (Le *et al* 2023a). Like the US model, it implies that fiscal policy can contribute to stability by limiting zero bound episodes.

For the eurozone, in a model that divided the zone into two separate regions, North and South, Minford *et al* (2022) found that it matched eurozone data well over the first two decades of the euro's existence; they modelled the zero bound indirectly by assuming the central bank rule targets the commercial credit rate with its repertoire of instruments, including QE. As in the other models just reviewed fiscal policy can increase stability substantially.

Similar results are found for Japan - Le *et al* (2023b). Growth in Japan has been notoriously weak, even though monetary policy has been stimulative for several decades. Fiscal policy has been intermittently stimulative between contractionary episodes where consumption taxes were raised; the simulation results show that a fiscal rule consistently exerting countercyclical pressure would have stabilised output more around a rising trend.

5. Conclusions

In this review of the recent empirical evidence on macro modelling, we have found that DSGE models based on New Keynesian principles extended to allow for banking, the ZLB and varying price duration can account well for recent macro behaviour across a variety of economies, whether large and approximately closed like the US or small and open like the UK.

Related models can also account for macro behaviour in Japan and the eurozone. These models all find that a contribution from active fiscal policy increases macro stability and welfare, essentially by reducing the frequency of hitting the ZLB, and sharing the stabilisation role with monetary policy whose effectiveness under the ZLB is much reduced.

All this implies that fiscal rules must allow fiscal policy to operate, instead of preventing it as UK and EU rules currently do. These rules must be refocused on long term solvency. ■

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Responsible innovation in disruptive digital and data technologies

Paul Samson, Constance de Leusse, Paul Fehlinger and Aaron Shull identify transformative technologies and argue that responsible innovation is essential because of their potential disruptive effects

Introduction

Rarely in human history has such large-scale, transformative technological change collided with massive geopolitical and economic trends. How do we ensure that the next iteration of the digital economy serves our societies positively, rather than undermining them? The answer lies in *“responsible innovation.”*

This brief’s outlook identifies a set of digital and information technologies and global trends that the authors expect to be transformative over the medium-term and will be at the heart of near-term efforts aimed at governance. The disruptive potential of these technologies is so strong that responsible innovation must be a key underlying ethos of their development and application.

By *“responsible innovation,”* the authors mean a framework that encompasses the ‘how’ of innovation (how to reduce innovation’s potential negative consequences and ensure its benefits are equitably spread) and the ‘what’ (by focusing attention on innovation that prioritizes our greatest shared challenges).

Implementing the principles of responsible innovation is a challenge because of the scale, pace and diffusion of technological development. This is compounded by a complex set of interactions with social, geopolitical and economic forces.

To meet this challenge and have the greatest impact for the public interest, decisionmakers need to look earlier in the innovation cycle. Responsible policy frameworks will impact not just how new technologies are used, but also their design, building, deployment, scaling, investment and regulation. This will require policymakers to be proactive, to be well-informed about technologies and to anticipate trends; hence, the authors’ focus on a medium-term outlook.

This effort is a joint creation of Project Liberty and the Centre for International Governance Innovation (CIGI). The authors are working together to examine the technologies they believe will rapidly and profoundly shape how we live.

Implementing the principles of responsible innovation is a challenge because of the scale, pace and diffusion of technological development. This is compounded by a complex set of interactions with social, geopolitical and economic forces

This admittedly non-exhaustive list has one commonality: everything on it presents urgent priorities for responsible innovation. The authors' goal is to support well-informed dialogue and proactive agenda setting in technological development, investment, commercial deployment and governance.

To do this, the authors will invite further analysis from leading experts on these technologies in 2024, to provide practical framing and in-depth perspectives that inform and support decision makers and national and international deliberative processes.

Technology vertical and horizontal trends

The authors unpack seven technology 'verticals', which are poised to have significant medium-term impact, and four 'horizontal', which are the forces and trends that will condition and drive the verticals' impact. The authors then set out critical factors for assessing responsible innovation and make recommendations for action through 2024.

Verticals

The seven digital technology verticals below are at different points on the innovation continuum: artificial intelligence (AI) is reaching broad adoption, quantum computing is getting ready for practical applications and biocomputing is just beginning to emerge. However, they all share the ability to disrupt sectors and economies in the medium term.

AI

AI is already deeply embedded in technologies throughout the economy and society (for example, in data analysis and weather prediction, algorithmic health recommendation systems and industrial robots). Generative AI can produce new text, sounds, images and video by using a statistical prediction model.

The need for significant training data, skills, capital and 'compute' (graphics processing unit chips, energy, networking and storage) means the most powerful foundation models are funded, and often managed directly, by established firms. There is a race for AI supremacy, with big bets placed by governments and private investors on national champions such as Mistral (France) and Aleph Alpha (Germany), and emerging disparities between rich and developing countries.

However, private AI investment is dominated by the United States, at \$47.4 billion¹ in 2022, 3.5 times the amount invested in China and 11 times the United Kingdom's investment (Maslej *et al* 2023, 189).

Through 2024 and beyond, as established model owners license access for enterprise and government applications, generative AI will likely have profound impacts throughout the economy. Growing awareness of externalized costs and harms (copyright, labour, privacy, environmental, security and safety) will focus attention on current issues as well as emerging global risks.

Principles developed by the Organisation for Economic Co-operation and Development (OECD); the United Nations Educational, Scientific and Cultural Organization (UNESCO); and the Group of Seven (G7) have spelled out broad ethics and guidelines.

The 2023 EU AI Act (European Parliament 2023) focuses on specific harms and individual protections, while the US Executive Order on Safe, Secure, and Trustworthy Artificial Intelligence (The White House 2023) provides an initial framework.

With accelerated wide-scale adoption, pressure will increase for more open models and access to powerful computers, especially outside the currently dominant countries (the United States and China). In the medium term, AI will become central to geopolitical tensions.

Quantum technologies

Quantum technologies include applications in cryptography, sensing, communications and imaging. There is a significant focus on quantum computing, which uses quantum mechanics to do much more complex calculations at speeds thousands of times greater than classical computing. This technology will also supercharge AI applications.

Recent developments mean there could be real-world applications within a few years. The complexity of the technology may, however, mean that dissemination will be slow. McKinsey & Company (2023) estimates that by 2030, only about 5,000 quantum computers will be operational.

Nevertheless, private investment is accelerating, with two-thirds of all funding occurring since 2018, so significant developments are expected over the next five years (World Economic Forum 2022, 13). Quantum computing's ability to break traditional strong encryption means that even a limited rollout by powerful actors will have profound impacts on the privacy and security of individuals and in many countries. Planned public investments are greatest in China, at \$15.3 billion, the European Union at \$7.2 billion and the United States at \$1.9 billion (ibid., 11).

In the next five to 10 years, applied quantum computing will boost advanced encryption, biotech and financial applications, as well as logistics optimization. The impacts for individual freedoms and national security will be profound. Policy makers will have to adjust their frameworks.

Brain-computer interfaces and neurotechnology

Brain-computer interfaces include neural implants and direct links between the human brain and an external device that can *"record, decode and stimulate neural activity"* (Nature Electronics 2023).

Neurotechnological devices currently include 'wearables' and external brain-computer interfaces for robotic limbs. In the pipeline are brain implants with the potential, for instance, to diagnose and treat paralysis, seizure disorders, stroke, and degenerative diseases such as Alzheimer's and Parkinson's (UNESCO 2023).

In addition to causing human suffering, these diseases cost trillions of dollars in care-related costs globally (Insel, Collins and Hyman 2015). Neurotechnology will have broad applications in health, AI, robotics and beyond. Ethical issues of testing on animals and humans are a core concern of responsible innovation.

These technologies could also be used to manipulate people and gather information about their thoughts, emotions, memories and identities. The potential threats to human agency and fundamental freedoms are significant, and UNESCO is developing an ethical framework.

As technologies emerge and are implemented, issues of equity, access and choice will be prominent. Today, it is questionable whether policymakers have fully grasped the challenges that are on the mid-term horizon in the fields of neurotechnology and brain-computer interfaces.

Web3 and decentralized technologies

Web3 is decentralized web infrastructure built with blockchain technology. Blockchain ledgers can enable decentralized data storage and ownership, thereby enabling greater levels of data control, economic value participation and interoperability of web services. This technology is also applicable for alternative financial products ('defi', or decentralized finance).

Web3 also allows the development of technical protocols for the social graph that gives users more agency over the personal data they share with intermediaries (for example, in social media). Many of these applications are already operating, but not at scale. Following crypto industry scandals and the shift to AI, investment in Web3 has fallen.

However, it is expected that new models based on greater individual control and agency will continue to emerge and grow in the coming years, especially in regions where there is less faith in financial institutions and the rule of law.

Broader socio-economic effects will notably include the environmental impacts of energy and water consumption, money laundering, and challenges in the regulation or policing of cybercrime, harassment and the dissemination of illegal content.

Defi alternatives to traditional financial infrastructure will continue to attract investment as resources for lesser-served and more innovative communities. Not only will this impact various economic sectors, but it will also trigger new regulatory approaches.

Digital Public Infrastructure

DPI consists of public benefit technologies, protocols or capabilities for areas such as digital identity, payments, social networking and data exchange, deployed or supported either by governments or public interest actors.

Government-issued DPI is already in use in several countries. Aadhaar, India's biometric digital identity system, reaches more than 1.3 billion people and is a key part of the 'India Stack', which is defined as *"government-backed APIs, or application programming interfaces, upon which third parties can build software with access to government IDs, payment networks and data"* (Parkin and Reed 2023).

Partial versions of the India Stack are being deployed in Ethiopia, Morocco, the Philippines and Sri Lanka, and more countries are likely to adopt it or deploy similar capabilities, following its prominence during the 2023 Group of Twenty (G20) Summit in India.

As DPI connects digital identity to other activities and services, and deprecates cash in favour of digital transactions, it increases citizens' legibility to governments. In the mid-term, this will entail significant risks for privacy and other freedoms.

State-led DPIs will aim to complement and enable private investment; for example, Brazil's 'Open Health' program aims to provide access to currently fragmented health records through a universal, standardized and interoperable data infrastructure that increases transparency and competition (Kuzev and Brown 2023).

Socially responsible DPI also emerges in other fields, where it is driven by public interest actors. Notable examples include new public interest infrastructures for technical protocol architectures such as the Decentralized Social Networking Protocol (DSNP) for healthier social networking², virtual worlds, and open AI models that seek to build the enabling infrastructure of a more socially responsible, open and competitive digital economy. The growing field of public interest technology is beginning to have global impacts³.

Extended Reality

XR includes virtual, augmented and mixed reality. It combines virtual and physical space and interactions by creating 'digital twins' that match what we do in the physical world, often via headsets or wearables. XR ranges from total immersion to smart glasses with an overlay on reality. It is currently applied in gaming and entertainment, training, remote working (for example, in telemedicine), engineering and manufacturing.

Its hardware has not been adopted as quickly as expected, and capital-intensive initiatives such as Facebook's/ Meta's 'metaverse' have not significantly taken off. The high requirements for user connectivity, computing power and equipment mean XR is still not ripe, but growing adoption is expected at a steady pace in the near future. XR, particularly when combined with advances in AI, has the potential to improve access to training, education, health care and work, reducing inequalities within and between countries.

However, speed of deployment will depend on capital investment, open standards and protocols, and also how decentralized virtual worlds will be. Public actors around the world, such as the European Commission, will start exploring how to regulate future virtual worlds.

Biocomputing and synthetic biology

Biocomputing uses organisms such as living cells as a substrate for computation and storage, just as silicon is used as a substrate in traditional computing. Synthetic biology uses digital technologies to engineer cells and molecules, including DNA.

Together, they can design and build tiny computers based on proteins or cells. These are slower than traditional computers but vastly more energy efficient and can store much more information. The DNA in one millilitre of bacteria could store the information of the entire internet (Gent 2023).

This technology could also act as tiny robots, treating disease, or as interfaces. Applications at an early stage of development include smart materials and electricity-conducting polymers that grow inside living plants to form circuitry, with potential use in agriculture. Biocomputing could have profoundly transformative applications across food security, energy production and human health, but is still emerging.

Vertical conclusions: cross-cutting impacts and global equity

These seven technology verticals are expected to help shape the next five years, but it is the interaction between them that amplifies disruption and transformation. This interaction may also trigger impact synergies; for example, DPIs will collect more personal data, feeding AI systems that may also be leveraged with quantum computing.

The World Intellectual Property Organization's Global Innovation Index 2022 identified two novel innovation waves: digital (supercomputing, AI and automation); and deep science innovation (biotech, nanotech and new materials) (Dutta *et al* 2022).

There will be significant disruptions at the intersection of data, AI, robotics and XR, bringing novel approaches, but also raising a range of issues about data ownership and autonomy, and public benefit investment.

We may begin to see transformation of entire sectors; for example, health will be transformed by precision and personalized medicine, driven by advances in genetic data, digital drug development, health-data spaces, robotics, telemedicine, and the sharing and analysis of biodata.

Many of these disruptive and transformative technologies risk exacerbating existing global inequalities, both within and between countries. For example, several of the most widely used large language models are directly run by existing US and China-based technology platforms (Kosma 2023).

Of the top 10 AI patent owners in the past 10 years, seven are in China, two are in the United States and one is in South Korea⁴. Currently, 50 percent of neurotech companies are in the United States, with another 35 percent in Europe and the United Kingdom (UNESCO 2023). Less developed countries face barriers in access, adoption and diffusion. Responsible innovation includes actively working to ensure benefits and opportunities are widely shared.

Horizontals

Horizontals are the 'giga-trends' — the key socio-economic and geopolitical forces and developments shaping how emerging technologies impact us. They include how debt levels and higher interest rates dampen risk appetite and investment capital, and how this can reduce development and access to new technologies.

The horizontals also include climate change, regulation, and increasingly volatile and transactional geopolitics. They highlight pressing planetary concerns where responsible innovation could be targeted to meet our greatest global challenges.

Macroeconomic trends

Higher interest rates and debt levels in most countries that have traditionally driven technological innovation will continue to lower risk tolerance and the availability of capital for investment. Extremely high-investment technologies such as generative AI may continue to be dominated by existing industry incumbents, driving an increasingly public discussion about equity and access. Higher interest rates and public debt also present a constrained environment for public investment in transformative technologies.

However, this may also focus attention on due diligence, sustainable revenues, broadly scalable use cases and the need for public-private collaboration to tackle humanity's toughest challenges. Negative and persistent trends relating to economic inequalities continue within most countries. Arresting these trends will be an essential part of policy responses.

Geopolitical competition

War, conflict and intense geopolitical rivalries, such as the Cold War, can lead to accelerated innovation and transformative technologies first developed for military purposes (for example, the internet and drones). Be it AI or quantum computing, major technology trends in the next five years will be dual-use technologies.

Conflict and volatility are driving investment; for example, the North Atlantic Treaty Organization Innovation Fund focuses on AI, autonomy, biotechnology, next-generation communications and space. For the first time, the

European Union has outlined an economic security agenda, focusing on the four technologies it wants to keep 'safe' for Europe (advanced semiconductors, AI, quantum and biotech) (European Commission 2023).

Broader geopolitical and geoeconomic changes will include China's internal consolidation of power and changing demographics; multipolarity; the activities of the BRICS (Brazil, Russia, India, China and South Africa); Africa rising; and the increasing movement of people in response to political turbulence and climate crises.

Responses to these developments include 'friend-shoring' (ie. concentrating supply-chain networks in closely allied countries), China's Belt and Road Initiative, and data sovereignty/protectionism rules that limit competition and the free flow of data.

However, supply-chain disruption and reinvention may also create opportunities. The impacts of all these factors on technology developments include chip availability; access to powerful compute, energy, water and high-level skills; competition for rare earth materials and other resources; and full strategic competition on quantum and AI.

Climate crisis

The year 2024 is likely to be marked by continuing extreme weather events and growing public concern about technology platforms' share of more limited and intermittent energy and water resources. Decarbonizing economies making the switch to electrification will see increased demand for energy and pressure on electrical grids, driving dependence on transitional sources before fully renewable sources come online.

The growing energy and water demands of AI use will add to demands for a more carbon-neutral digital economy. While the tighter financial climate and geoeconomic competition could be a barrier to investment in less energy-intensive computing, they could also increase market incentives to use fewer resources.

Climate and clean tech more broadly will receive significant investment, and the predictive powers of AI will be employed in weather, financial services such as insurance, emissions-trading markets and elsewhere. The more distant but potentially transformative promise of low-energy biocomputing may attract investment.

Technology regulation

The 2020s have seen digital and data technology become regulated, similar to how financial services were in the 1920s. Around the world, comprehensive frameworks are being adopted at national and international levels.

Europe is a trendsetter in the regulation of new technologies, with its major regulatory packages on digital services, data, AI and competition that will likely inspire similar frameworks elsewhere. Africa, with its 2063 framework, and Latin America and the Caribbean, through the UN Economic Commission for Latin America and the Caribbean process, are exploring establishing single digital markets through harmonized regulations to enhance crossborder data flows and services.

Several new international frameworks (on AI in the Council of Europe and neurotechnology at UNESCO) are being discussed. New regulation can make innovation more cumbersome, but it can ensure consumer protection, security, competition and choice, and lower market barriers to encourage future innovation by new entrants.

It can also provide essential legal certainty for investors, for example, when the legalization of strong encryption in the late 1990s unleashed commercial web-based services.

Regulation of generative AI is likely at the national level, often prompted by international coordination initiatives, but it may be constrained by concern for national competitiveness.

Responsible innovation reduces or mitigates harms and drives more equitable distribution of benefits, but it has a key third plank: focusing collective efforts on fundamental challenges that bring together all stakeholders (international organizations, governments, businesses, investors, civil society, technologists and academia).

It requires governance across existing gaps to anticipate future benefits, harms and opportunities to serve wider goals. International governmental organization processes such as the UN Secretary-General's Global Digital Compact initiative, other global governance efforts such as the G7 and G20, the OECD, regional and national processes, and multi-stakeholder processes are critical to ensuring that responsible innovation equitably and effectively tackles global challenges.

Responsible innovation could soften the impact of geoeconomic trends

Looking at how the verticals and horizontals interact, there is a risk that both public and private investors focus almost exclusively on winning technological arms races — either for sector dominance or geopolitical rivalry — and deprioritize ethics and responsible innovation.

However, any short-term, narrow gains may come with wider social and economic costs, further driving inequality and tensions. Responsible innovation builds more stable and profitable businesses than unfettered disruptive approaches.

To make this work in a more accelerated and transactional world, innovators and regulators need new ways to discuss innovation challenges as a common concern. Dialogue, transparency and ongoing consultation and learning are essential to ensuring responsible innovation works for everyone.

However, there is a risk of the regulatory pendulum swinging back too hard toward overregulating, after the long period of 'light-touch' regulation in the early 2000s.

Key responsible innovation factors

Innovation in data and digital technologies can be assessed to determine whether it is responsible by questioning its impacts against the following criteria.

Ethical values: Are the innovation impacts and methods ethical? Do they align with defined sectoral ethical principles and values such as human rights, fairness and justice?

Societal wellbeing: Does the social impact contribute to social wellbeing (for example, shared gains in living standards), or does it exacerbate social inequalities and erode democracy?

Economic fairness: Does innovation reduce or increase economic and social inequality? Does it support competition, not gatekeeping, and maintain open pathways for future innovation by new entrants, letting users control their data and participate in the economic value created with it? Are its economic benefits widespread rather than concentrated?

Environmental sustainability: Is the innovation environmentally sustainable, both in its development and scaled implementation? Is it sufficiently carbon-neutral or negative, and does it impact neutrally or positively on ecosystem health and biodiversity?

Inclusivity and accessibility: Is the innovation broadly inclusive and accessible? Does it exclude certain populations or maintain existing inequalities? Has it been developed and is it governed with real engagement and input from the people it will affect?

Privacy, data agency, human dignity and security: Is the fundamental right of individual privacy and agency over personal data designed as part of the innovation? Does it increase people's digital autonomy and choice, or are there dark patterns in the design? Does it impact security, including cybersecurity?

Assessing innovations using these factors will help to ensure that transformative digital technologies are a net positive to humanity and help to tackle our greatest challenges.

More broadly, it will be essential to ensure there are targeted channels and opportunities for technology transfer and access. Innovators in countries outside the current narrow list of countries that dominate investment in most of the seven key technologies need more opportunities to be part of the coming wave of disruption and transformation.

Recommendations for an effective, responsible innovation agenda

Below are five high-level recommendations for policy and industry leaders working in a multi-stakeholder fashion in 2024, with a view to the next five years. They are aimed at anticipating risks, managing opportunities, and leveraging digital and data innovation for the greatest good.

1. Develop a common approach to assess innovation and ensure it is ethical by design. Set global, quantifiable metrics for measuring the impacts of technology through scientific evidence inspired by the Intergovernmental Panel on Climate Change.
2. Identify mechanisms to counterbalance negative market externalities of new digital technologies (AI, social media, virtual worlds and so forth) through public interest technologies and other frameworks such as open-

source technology or economic redistribution mechanisms to enhance positive societal benefits, innovation and competition in developed and developing countries.

3. Develop a clear set of criteria for ethical investment in tech for public and private sector investors.
4. Invite businesses to develop mainstream standards for a new corporate function (ie. establishing chief digital ethics or responsible innovation officers) at the executive level. Create ethical deployment units in all large-scale tech companies.
5. Invite governments to structure consultation channels for researchers, civil society, the private sector and citizens to understand and influence the impacts of technological innovation, and to strengthen stakeholder consultation mechanisms in their existing processes.

Next steps

Effective and responsible innovation requires urgent mainstream attention and evidence baselines, similar to what we have seen with climate action in the 1990s: strategic direction, effective and appropriate governance, sufficient investment, resources, timelines, broad collaboration and knowledge sharing.

This is why Project Liberty and CIGI will work together in the coming months, partner with other interdisciplinary researchers to sharpen our assessment of emerging disruptive technologies, and reach a deeper understanding of upcoming risks, opportunities and responsible innovation challenges and priorities.

What, if any, governance gaps exist, and how can we ensure responsible innovation all the way through the transformative technology pipeline? The authors' forthcoming work will support decision makers in understanding

the key questions they need to ask at each of the different innovation stages of transformative digital and data technology. ■

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Endnotes

1. All dollar figures in US dollars.
2. The DSNP is supported by Project Liberty; see <https://dsn timer.org/>.
3. See <https://pitcases.org/>.
- 4 For patent owners in machine learning and AI worldwide from 2013 to 2022, by number of active patent families, see www.statista.com/statistics/1032627/worldwide-machine-learning-and-ai-patent-owners-trend/.

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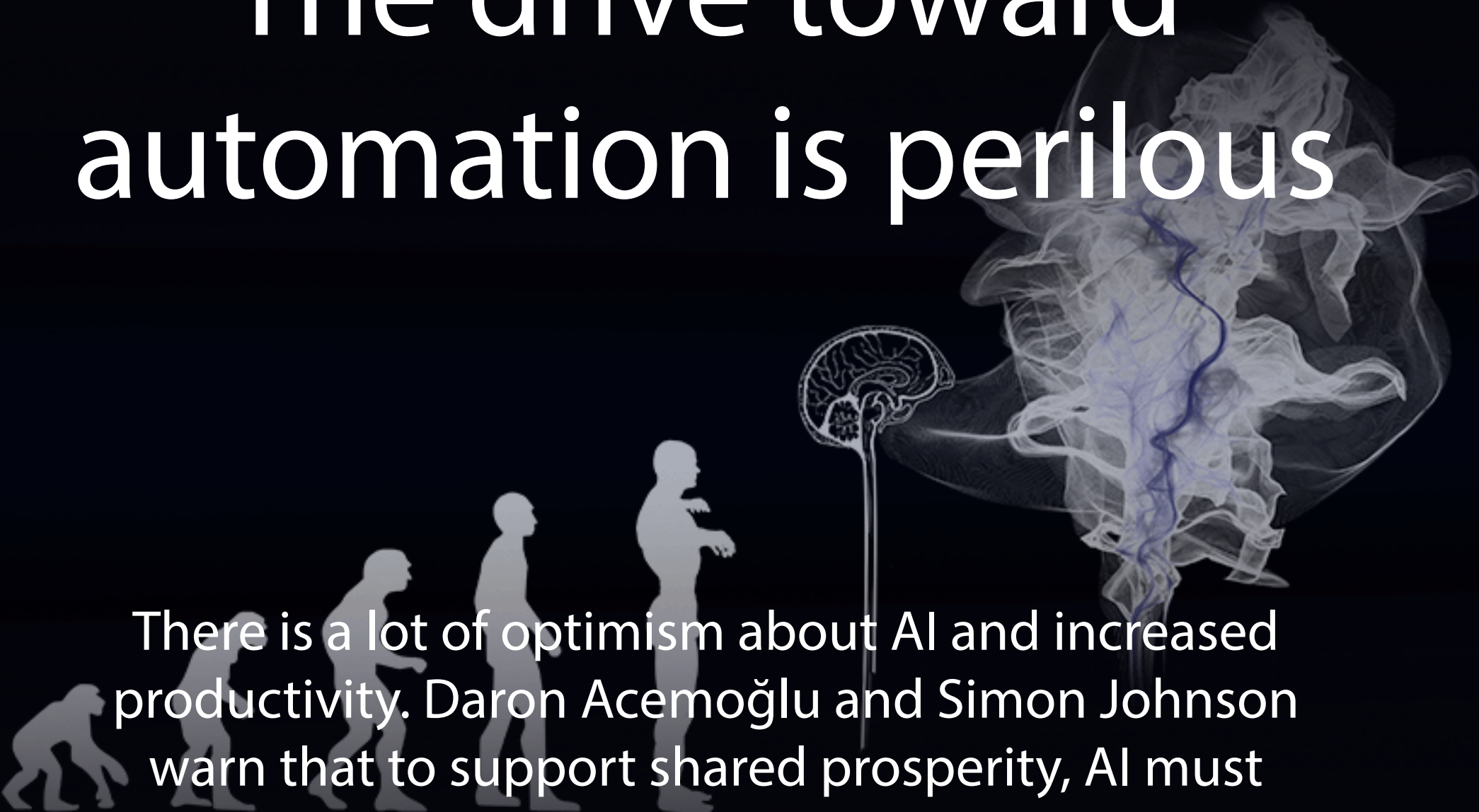
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The drive toward automation is perilous



There is a lot of optimism about AI and increased productivity. Daron Acemoğlu and Simon Johnson warn that to support shared prosperity, AI must complement workers, not replace them

Optimistic forecasts regarding the growth implications of AI abound. [AI adoption could boost productivity](#) growth by 1.5 percentage points per year over a 10-year period and raise global GDP by 7 percent (\$7 trillion in additional output), according to [Goldman Sachs](#). Industry insiders offer even [more excited estimates](#), including a supposed 10 percent chance of an ‘explosive growth’ scenario, with global output rising more than 30 percent a year.

All this techno-optimism draws on the ‘productivity bandwagon’: a deep-rooted belief that technological change—including automation—drives higher productivity, which raises net wages and generates shared prosperity.

Such optimism is at odds with the historical record and seems particularly inappropriate for the current path of ‘just let AI happen’, which focuses primarily on automation (replacing people). We must recognize that there is no singular, inevitable path of development for new technology.

And, assuming that the goal is to sustainably improve economic outcomes for more people, what policies would put AI development on the right path, with greater focus on enhancing what all workers can do?

The machinery question

Contrary to popular belief, productivity growth need not translate into higher demand for workers. The standard definition of productivity is ‘average output per worker’—total output divided by total employment. The hope is that as output per worker grows, so will the willingness of businesses to hire people.

But employers are not motivated to increase hiring based on average output per worker. Rather, what matters to companies is marginal productivity—the additional contribution that one more worker brings by increasing production or by serving more customers.

The notion of marginal productivity is distinct from output or revenue per worker; output per worker may increase while marginal productivity remains constant or even declines.

Many new technologies, such as industrial robots, expand the set of tasks performed by machines and algorithms, displacing workers. Automation raises average productivity but does not increase, and in fact may reduce, worker marginal productivity. Over the past four decades, automation has raised productivity and multiplied corporate profits, but it has not led to shared prosperity in industrial countries.

AI offers an opportunity to complement worker skill and expertise if we direct its development accordingly

Replacing workers with machines is not the only way to improve economic efficiency—and history has proved this, as we describe in our recent book, *Power and Progress*. Rather than automating work, some innovations boost how much individuals contribute to production.

For example, new software tools that aid car mechanics and enable greater precision can increase worker marginal productivity. This is completely different from installing industrial robots with the goal of replacing people.

New functions

The creation of new tasks is even more important for raising worker marginal productivity. When new machines open up new uses for human labour, this expands workers' contributions to production and increases their marginal productivity.

There was plenty of automation in car manufacturing during the momentous industry reorganization led by Henry Ford starting in the 1910s. But mass-production methods and assembly lines simultaneously introduced a range of new design, technical, machine-operation, and clerical tasks, boosting the industry's demand for workers.

New tasks have been vital in the growth of employment and wages over the past two centuries. And many of the fastest-expanding occupations in the past few decades—those of MRI radiologists, network engineers, computer-assisted machine operators, software programmers, IT security personnel, and data analysts—did not exist 80 years ago.

Even people in occupations that have been around longer, such as bank tellers, professors, and accountants, now work on many relatively new tasks using technology. In almost all these cases, new tasks were introduced because of technological advances and have been a major driver of employment growth.

These new tasks have also been integral to productivity growth—they have helped launch new products and enabled more efficient production processes.

Productive automation

Automation in an industry can also drive up employment—in that sector or in the economy broadly—if it substantially increases productivity. In this case, new jobs may come either from nonautomated tasks in the same industry or from the expansion of activities in related industries.

In the first half of the 20th century, the rapid increase in car manufacturing stimulated massive expansion of the oil, steel, and chemical industries. Vehicle output on a mass scale also revolutionized the possibilities for transportation, enabling the rise of new retail, entertainment, and service activities.

The productivity bandwagon is not activated, however, when the productivity gains from automation are small—what we call ‘so-so automation’. For example, self-checkout kiosks in grocery stores bring limited productivity benefits because they merely shift the work of scanning items from employees to customers.

When stores introduce self-checkout kiosks, fewer cashiers are employed, but there is no major productivity boost to stimulate the creation of new jobs elsewhere. Groceries do not become much cheaper, there is no expansion in food production, and shoppers do not live differently.

Even nontrivial productivity gains from automation can be offset when they are not accompanied by new tasks. For example, in the American Midwest, the rapid adoption of robots has contributed to mass layoffs and ultimately prolonged regional decline.

The situation is similarly troubling for workers when new technologies focus on surveillance. Increased monitoring of workers may lead to some small improvements in productivity, but its main function is to extract more effort from workers.

All this underscores perhaps the most important aspect of technology: choice. There are often myriad ways of using our collective knowledge to improve production and even more ways to direct innovation. Will we invent and implement digital tools for surveillance, automation, or to empower workers by creating new productive tasks?

When the productivity bandwagon is weak and there are no self-correcting mechanisms to ensure shared benefits, these choices become more consequential—and a few tech decision-makers become economically and politically more powerful.

Complementing humans

New technology may complement workers by enabling them to work more efficiently, perform higher-quality work, or accomplish new tasks. For example, even as mechanization gradually pushed more than half of the US labour force out of agriculture, a range of new blue-collar and clerical tasks in factories and newly emerging service industries generated significant demand for skilled labour between about 1870 and 1970. This work was not only better paying but also less dangerous and less physically exhausting.

This virtuous combination—automation of traditional work alongside creation of new tasks—proceeded in relative balance for much of the 20th century. But sometime after approximately 1970, this balance was lost. While automation has maintained its pace or even accelerated over the ensuing five decades, the offsetting force of new task creation has slowed, particularly for workers without four-year college degrees.

As a result, these workers are increasingly found in low-paying (though socially valuable) services such as in cleaning, food service, and recreation.

The critical question of the new era of AI is whether this technology will primarily accelerate the existing trend of automation without the offsetting force of good job creation—particularly for non-college-educated workers—or whether it will instead enable the introduction of new labour-complementary tasks for workers with diverse skill sets and a wide range of educational backgrounds.

It is inevitable that AI systems will be used for some automation. A major barrier to automation of many service and production tasks has been that they require flexibility, judgment, and common sense—which are notably absent from pre-AI forms of automation.

Artificial intelligence, especially generative AI, can potentially master such tasks. It is unclear how much this type of automation will contribute to aggregate productivity growth while these technologies are immature, but they could contribute to sizable productivity gains as costs fall and reliability improves.

The dominant intellectual paradigm in today's digital tech sector also favours the automation path. A major focus of AI research is to attain human parity in a vast range of cognitive tasks and, more generally, to achieve artificial general intelligence that mimics and surpasses human capabilities. This intellectual focus encourages automation rather than the development of human-complementary technologies.

However, AI offers an opportunity to complement worker skill and expertise if we direct its development accordingly.

Human productivity is often hampered by lack of specific knowledge or expertise, which could be supplemented by next-generation technology. For example, AI holds great potential for training and retraining expert workers, such as educators, medical personnel, and those in modern crafts (such as electricians and plumbers).

AI could also create new demands for human expertise and judgment in overseeing these processes, communicating with customers, and enabling more sophisticated services.

Five principles

Redirecting technological change is not easy, but it is possible. Governments everywhere—especially in the US and other countries where technology is under active development—should take the following five steps to help put AI development onto a human-complementary, rather than human-displacing, path:

Reform business models: The dominant developers of AI easily expropriate consumer data without compensation, and their reliance on digital advertising incentivizes grabbing consumers' attention through any means possible. Governments need to establish clear ownership rights for all consumers over their data and should tax digital ads. Enabling a more diverse range of business models—or even requiring more competition—is essential if AI is to be helpful to all humans.

Tax system: The tax code in the US and many other countries places a heavier burden on firms that hire labour than on those that invest in algorithms to automate work. To shift incentives toward human-complementary technological choices, policymakers should aim to create a more symmetric tax structure, equalizing marginal tax rates for hiring (and training) labour and for investing in equipment and software.

Labour voice: Given that workers will be profoundly affected by AI, they should have a voice in its development. Government policy should restrict deployment of untested (or insufficiently tested) AI for applications that could put workers at risk, for example in high-stakes personnel decision-making tasks (including hiring and termination) or in workplace monitoring and surveillance.

Funding for more human-complementary research: Research and development in human-complementary AI technologies require greater support. Governments should foster competition and investment in technology that pairs AI tools with human expertise to improve work in vital social sectors. Once there is sufficient progress, governments can encourage further investment with advice on whether purported human-complementary technology is appropriate for adoption in publicly funded education and health care programs.

AI expertise within government: AI will touch every area of government investment, regulation, and oversight. Developing a consultative AI division within government can help agencies and regulators support more timely, effective decision-making.

Potential macroeconomic impact

AI could increase global GDP over the next five years, although not as substantially as enthusiasts claim. It might even modestly raise GDP growth in the medium term. However, on our current trajectory, the first-order impact is likely to be increased inequality within industrial countries.

Middle-income countries and many lower-income countries also have much to fear from the existing path. New capital-intensive technology will soon be applied everywhere. There is no guarantee that, on its current path, AI will generate more jobs than it destroys.

If we can redirect AI onto a more human-complementary path, while using it to address pressing social problems, all parts of the planet can benefit. But if the just-automate approach prevails, shared prosperity will be even harder to achieve. ■

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This article is adapted from the authors' book, [Power and Progress: Our 1000 Year Struggle over Technology and Prosperity](#), and also draws on joint work with David Autor, and was first published in [F&D](#), December 2023.



Can AI prevent financial crises?

Financial markets have inherent instability. Daniel Dăianu considers the role of AI but finds it hard to imagine a complete replacement of human judgment in monetary policy

In another text, I argued that artificial intelligence does not alter economic logic/rationality, nor does it eliminate competition, income and wealth disparities among individuals and groups of people, or between societies/states¹. What public policies aim to do is to mitigate such disparities and derived social tensions within economies.

Internationally, interventions are carried out by specialized international financial bodies such as the IMF, while in the EU, various stabilization mechanisms and structural and cohesion funds operate.

A related question is whether AI can prevent financial or economic crises. The almost automatic answer is no. Because AI does not change economic logic or rationality, and competition does not disappear. In other words, business/economic cycles do not vanish, whether we consider short and medium-term fluctuations in economic activity or longer-term ones generated by investment cycles and major technological breakthroughs that induce technological cycles.

And yet, can't AI reduce/eliminate judgment errors, improve models and algorithms so that decisions are as close to full optimality as possible, leading to market stability even if asymptotically? Markets, of course, are dynamic.

This question makes sense when we consider that there are more or less adequate models, more or less effective algorithms used by market participants. This leads us to the great dispute regarding the interpretation of financial markets' functioning: the 'efficient markets hypothesis' put forward by Eugene Fama (1965) vs. Hyman Minsky's 'financial instability hypothesis' (*Stabilizing an unstable economy*, 1986), the latter following a path initiated by Irving Fisher and John Maynard Keynes in the interwar period of the last century. Keynes spoke of 'animal spirits' in financial markets, of 'multiple equilibria' in the economy, and the need for stabilization interventions.

The global financial crisis that erupted in 2008 further proved that financial markets have inherent instability, that the internal drivers that move autonomous expansion and contraction of credit (financial flows) cannot be eliminated, leading to cycles of boom and bust.

Here we find the rationale for the re-imposition of financial market regulations after 2009 (following the wave of deregulation that began in the City of London in the 1980s and continued through similar measures in the USA), the introduction of macroprudential measures aimed at limiting excessive lending, financial flows, and requiring banks to hold higher capital and liquidity reserves.

*AI cannot prevent financial (and economic) crises,
but it could help mitigate their negative effects*

Unfortunately, the non-bank financial system is still insufficiently regulated, with inconsistencies in this regard. And how much capital and liquidity reserves should be adequate remains a controversial topic – despite the fact that common sense suggests that more reserves should make the system more robust.

AI can amplify ‘herd behaviour’ even if new technologies, algorithms, process much more information (big data), and the models used by banks and investment funds to manage risks would be more sophisticated. It is worth remembering that those who managed the LTCM risk fund benefited from super-sophisticated models (two Nobel laureates worked there), but they were thrown off track by extreme events, by non-linearities. And other similar failures occurred.

AI can indeed facilitate fraud, although it could also aid authorities in detecting them.

AI cannot eliminate contagion in markets, which is a form of chain reaction, a ‘herd effect’, and it often necessitates state intervention (by the central bank) as a lender of last resort. This was seen in the United Kingdom in 2022 after misguided decisions by the Truss government, which affected the stability of the pension system; it was also seen in the United States with the fall of Silicon Valley Bank and other turbulence in the banking system, which compelled the Fed to intervene through new lines of financial assistance and revision of regulations.



No matter how much we would like to believe that AI can improve internal prudence and optimize decisions at the microeconomic level, it is worth considering that:

a) decisions cannot be entirely put on autopilot (and even if they were, it still wouldn’t solve the issue of avoiding critical moments, crises) and

b) micro-level rationality does not ensure macro-level stability because of compounded effects leading to fluctuations in economic activity, panic. Thus, we return to Minsky, Keynes, Fisher, etc.

The thesis of those who advocate the elimination of the state (and central banks) from the economy to prevent financial crises is more than heroic; it is fundamentalist and has been invalidated by history. The emergence of central banks was precisely demanded by the need to prevent moments of great financial stress, to halt panic.

In the United States, for example, it was demanded by the main protagonists in the financial markets, including JP Morgan. The fact that central banks can make mistakes is another story because no institution is infallible.

However, no matter how much criticized, for example, quantitative easing measures (QE), without them, the financial crisis would have been much more acute, similarly during the Pandemic. On the other hand, it can be argued that for many years (during the Great Moderation period with low inflation and low unemployment), large central banks underestimated the exceptional nature of certain conditions (including the impact of globalization) and tolerated the creation of speculative bubbles.

This is what, ironically, Alan Greenspan, the former Fed chairman, called 'irrational exuberance'. Robert Shiller, also a Nobel laureate in economics, has dedicated many analyses to behavioural excesses in financial markets. And Greenspan himself, in congressional hearings on the causes of the financial crisis, noted that a wrong paradigm dominated the Fed's monetary policy, which, by the way, as the issuer of the world's main reserve currency, allowed the US government to consistently run large budget deficits.

The role of fiat money in economic dynamics can be discussed, especially considering that some central banks seem to have sought to prevent any recession through excessively lax monetary policies – as mentioned in the

previous paragraph; this is a frequent reproach made by the BIS (Bank for International Settlements) to some central banks.

This leads us to a relevant discussion about whether AI could 'optimize' monetary policies. However, monetary policies depend on paradigms (the set of assumptions), be it about the very functioning of financial markets, the role of economic agents' expectations (rational expectations or not), the illusion of equivalence between price stability and financial stability, the role of the non-banking financial sector, etc.

AI could also assist in better figuring out what is R^* , the natural rate in the economy, an unobservable variable but that indirectly guides the monetary policy conduct; similarly, regarding the financial (in)stability real interest rate, R^{**} , which is the level of the central bank's real policy rate that could trigger financial instability (O Akinci *et al* 2021).

However, it is hard to imagine a complete replacement of human judgment in monetary policy decision-making and macroprudential policy (which primarily concerns financial stability).

III

AI cannot eliminate the distinction between micro and macro, with theoretical and practical implications. Individual and firm-level behaviours can be rational (pursuing net gain in relation to various constraints, including ecological ones), increasingly less subject to emotions through the use of algorithms (AI), while economic activity cannot avoid economic fluctuations, whether small or large in scale.

The question is whether there is a basis for central authority (government, central bank) to intervene in attempting to reduce significant fluctuations, stabilize economic activity, and prevent large-scale crises. If the answer is yes, then it can be discussed whether these interventions can be assisted by AI.

And thus, we arrive at macroeconomic models and forecasts, rules and principles used by governments and central banks, by international financial organizations – by governments in formulating budgetary policies, by central banks in monetary and macroprudential policies, by international financial organizations and interstate groups as facilitators of policy coordination among states (eg. the G20 had such a role in the collective response to the Global Financial Crisis).

Central banks have long been granted operational independence to avoid being influenced by whims and pressures from governments. The presumption is that decision-makers adhere to sound standards of policy conduct for a central bank.

It is worth repeating that this does not mean central banks operate with magic tools, not least because there are many nontrivial uncertainties in monetary theory and practice, and often the sagacity and experience of decision-makers come into play, can make a difference.

The emergence of independent fiscal councils (national IFIs) in OECD countries, in the EU (especially after the sovereign debt crisis), aims to ensure that principles of fiscal prudence are adhered to by governments, thereby promoting the sustainability of public debts.

However, it should be noted that from the standpoint of a country's financial situation, private indebtedness is no less important than public indebtedness. Balance of payments crises thoroughly prove this.

Consider also that in the US, in EU countries etc. public budgets have taken over private debts (of banks) to save financial systems – beyond unconventional operations by central banks. Furthermore, fiscal rules are not God given; they must be adapted according to circumstances.

IV

It can be inferred that attempting to avoid any recession in the economy invites excesses and imbalances (not only through moral hazard) and leads to larger debts, both public and private. This is an empirically verifiable observation.

Therefore, regulations and public policies should not destroy the market entry and exit mechanism, which gives vitality to the economy and stimulates innovation. The budget constraints of countries (hard budget constraints, in Janos Kornai's meaning) should differentiate between good and less good, bad companies in the markets, rewarding superior performance and vice versa.

However, regulations and public policies have the role of mitigating behavioural excesses that can lead to overall economic breakdown, preventing abuses of power and fraudulent behaviour in markets.

At the same time, public policies must strike a rational compromise between the need for economic balance and the imperative of fairness, inclusive development (which involves education for all citizens, 'equal opportunities').

A lesson in good practice in this regard is provided by Scandinavian countries (consider their public debts as a proportion of GDP, much below the EU average; public spending on education and healthcare).

Civilized capitalism and social insurance instruments, significant social expenditures, do not necessarily imply ever-rising public and private debts. To prevent debts from overwhelming economic systems, sober management of public policies is needed, opposition to rampant populism and demagoguery, resistance to pressure from interest groups. Visionary thinking, understanding of immediate challenges and long-term ones is also necessary. Courageous leaders who speak the truth are needed as well.

It must also be emphasized that financialization has exacerbated economic instability, speculative behaviour, and economic inequalities; it has favoured major financial crises, which have required interventions by states and central banks, leading to the socialization of losses.

A lesser instability in economies would require a reconfiguration of financial systems, a de-financialization, and simplification; the increasing complexity of financial systems does not foster economic stability.

It is not by chance that the idea of 'narrow banking' is sometimes brought up (here the development of non-bank financial entities that offer banking services must be examined).

A good, more stable economy requires also 'good citizens'; incentives cannot obliterate the need for citizens with good conduct (Samuel Bowles, *The Moral Economy*, Yale University Press, 2016). Bowles aligns his reasoning with Adam Smith (*Theory of Moral Sentiments*), Kenneth Arrow, Amartya Sen, who all emphasized the importance of morality, ethics, in economic life. However, economic motivations ultimately define human behaviour; the struggle for economic survival is visible at every level of human life.

Conclusion

AI cannot prevent financial (and economic) crises, but it could help mitigate their negative effects. Nonetheless, as some anticipate, AI could lead to the destruction of more than 40% of current jobs worldwide. Without a considerable, compensatory creation of new jobs, we would witness widespread destruction with very serious economic and social implications, including financial ones – not the 'creative destruction' as Joseph Schumpeter would say.

Not to mention that, as noted by Nouriel Roubini (*Project Syndicate*, February 5, current year), stupidity in the world is overwhelming and could easily nullify the benefits of AI. ■

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Endnote

1. *'Can AI change economic logic?'* Hotnews and Contributors, January 28, current year.

New technologies in the workplace



The slow but steady uptake of AI in Europe impacts the quantity, quality and nature of jobs as well as worker wellbeing. Laura Nurski provides a round-up of project research

As Bruegel's *Future of Work and Inclusive Growth* (FWIG) project is coming to an end this year, we wish to present its main research results in a series of summaries. The focus of this summary is on *Workstream 1: New technologies in the workplace*. This worksteam documented how the slow but steady uptake of artificial intelligence (AI) in Europe impacts the quantity, quality and nature of jobs as well as worker wellbeing.

Uptake: the adoption and acceptance of AI in the workplace

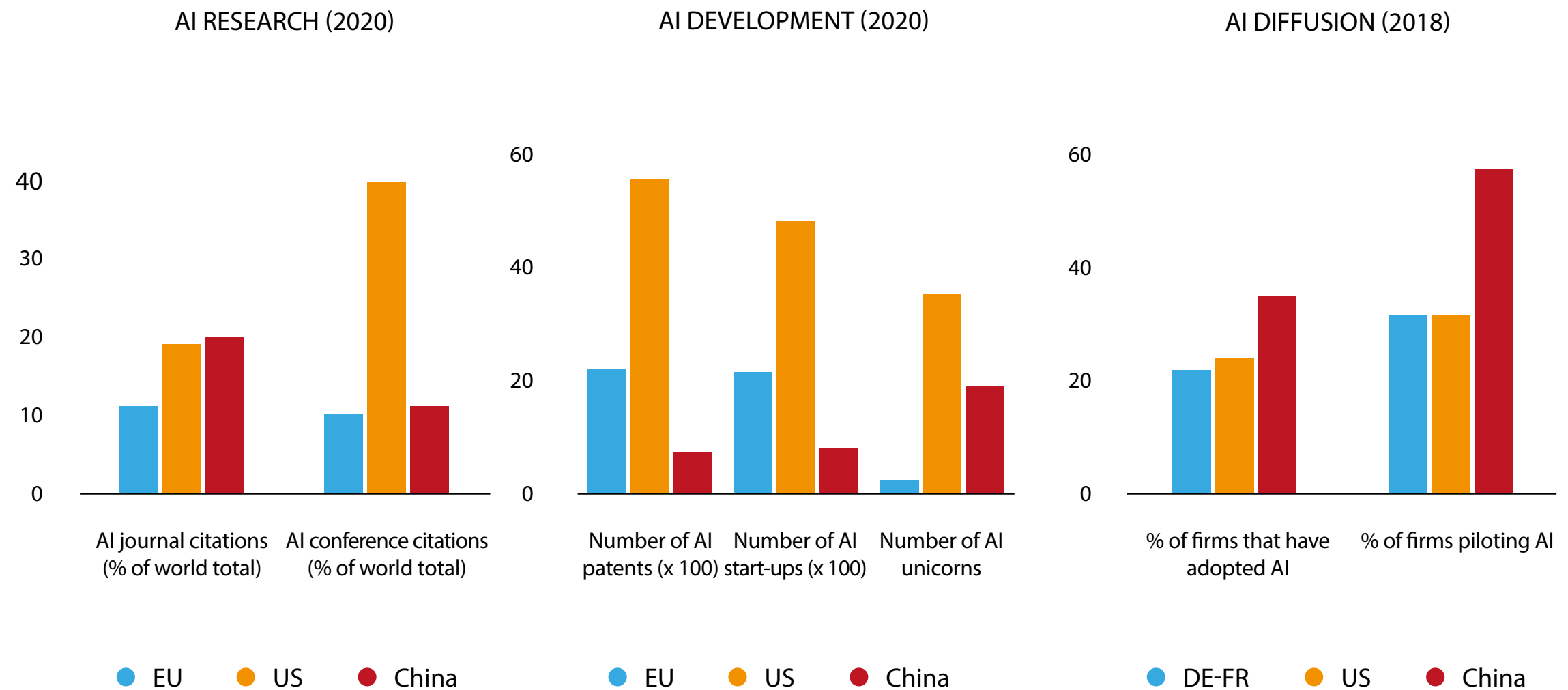
In a [policy brief](#) (30 November 2021) and an article on the Bruegel blog (6 December 2021) Mia Hoffmann and Laura Nurski wrote about the level and drivers of AI adoption by European firms. Although estimates vary widely because of uneven data collection and lack of a standard definition and taxonomy, AI research, development and adoption in Europe is low compared to the US and China.

European firms experience barriers to adoption in terms of human capital, data availability and funding. To accelerate the roll-out of AI technology across the European Union, policymakers should alleviate those barriers, both in the environmental context – labour market, financial market and regulation – and in the technological context – data availability, basic digitisation of businesses and technological uncertainty.

To address the lack of a standard definition and taxonomy of AI in the workplace, Mario Mariniello and Mia Hoffmann proposed a use-based taxonomy of biometric technologies at work in their [policy brief](#) from 17 November 2021. They defined biometric technologies as AI technologies that rely on biometric data to derive inferences about the individual whose data is collected.

Their proposed taxonomy classifies technologies into four broad categories based on their main function: 1) security, 2) recruitment, 3) monitoring and 4) safety and wellbeing. EU regulation of AI in the workplace should

Figure 1. Comparing outcomes for AI success in the EU, the US and China



Note: a) Patents: Only ~8% of patents filed provide information on the geographical affiliation, therefore the data presented here has limited reliability. As a share of all global AI patent filings, the US accounts for 3.2%, the EU27 for 1.3% and China for 0.4%. b) Start-ups: the number reflects the sum of start-ups that received funding of at least \$400,000 over the past five years (2016-2021).

Source: Bruegel based on Duranton et al (2018), CBInsights and Zhang et al (2021). Reproduced from Hoffmann & Nurski (2021).

integrate more detail on technology use and policymakers should design incentive mechanisms to encourage adoption of the technologies with the greatest potential to benefit workers. Bigger companies that use biometrics should be required to assess the effect of AI adoption with the active participation of their workforces.

Active participation of workers in the implementation of workplace AI is also necessary for a smooth integration of AI in tasks and work processes, as Mia Hoffmann and Laura Nurski argued in a [blog](#) post from 30 June 2021. When new technologies are not perceived by users to be easy to use or valuable to their daily tasks, they will not be fully accepted and embraced by workers.

Worker participation is important for securing good job quality outcomes, at both the innovation and adoption stages

Employers, AI developers and regulators should ensure new technologies work for employees both before and after implementation. While post-implementation training can only go so far, essential pre-implementation interventions include increasing the system's transparency and fairness, end-user customisation and testing, and incentive alignment between technology use and job requirements.

Laura Nurski's [case study](#), published on 16 March 2023, delves into the drivers and barriers concerning the adoption of artificial intelligence in the public sector.

Through examining organisational and worker acceptance of AI, the study finds the importance of a human-centred approach for successful AI adoption. This involves early involvement of workers in development phases, alignment of human resources, IT, and business processes, and targeted subsidy support mechanisms.

However, the adaptation challenges of existing work processes and legacy IT systems, alongside the varying usefulness of AI based on task routineness and worker experience, highlight the need for further investments in organizational capital for a successful AI roll-out in Europe?

Finally, in the [technology adoption dashboard](#) of 11 September 2023, Giulia Gotti, Duygu Güner and Tom Schraepen presented several key trends and figures on technology adoption in Europe. The dashboard helps users to answer questions relating to various aspects of technology adoption in the EU member states, bringing together a variety of data sources.

It provided statistics on the adoption of AI, big data applications, cloud computing and robots, as well as the necessary foundations of technology adoption, namely the availability of human resources and connectivity in Europe.

Table 1. A taxonomy for biometric AI systems in the workplace

Purpose	Technologies used	Use case	Real life example/brand
Security	Facial, fingerprint, gait, keystroke recognition	Access control, continuous authentication	BehavioSec, Innovatrics, FaceKey
Recruitment	Affective computing based on computer vision, voice and speech recognition and natural language processing (NLP)	AI-powered job interviews and personality assessments to evaluate candidates	Pymetrics, HireVue, Retorio
Monitoring	Affective computing based on voice recognition and NLP; wearable movement trackers; eye movement trackers; smart mouse	Worktime control, productivity and activity tracking, performance measurement	Cogito, WorkSmart, Geodis, Humanyze
Safety and wellbeing	Smart wearables; Computer vision	Accident prevention; physical and psychosocial health risk management	StrongArm Technologies, Fitbit, (many technologies in development)

Source: Reproduced from [Mariniello & Hoffmann \(2021\)](#).

Quantity: the employment effects of AI

Georgios Petropoulos and Sybrand Brekelmans (a Bruegel [blog](#) article, 29 June 2020) evaluate AI's differential impact on jobs and employment across the skills spectrum. While previous technological revolutions (ICT and robots) caused job polarisation (the shift of employment away from middle-skilled jobs), they found that AI is highly likely to significantly alter not only middle-skilled jobs, but also low-skill employment (see figure 1).

Moreover, while the high-skilled jobs are relatively less at risk from AI and ML-induced transformation, its impact is still non-negligible for these jobs.

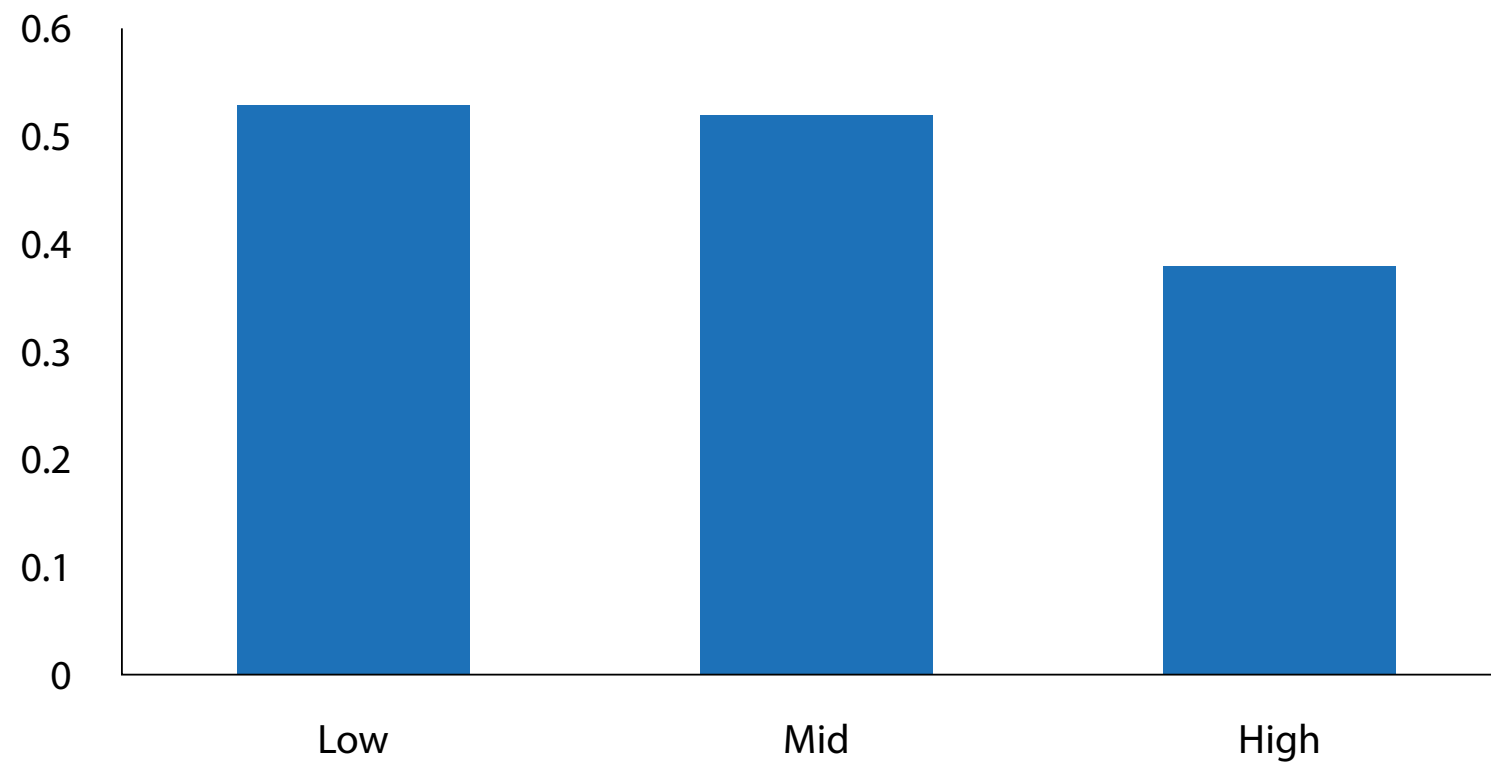
The same authors (in a Bruegel [blog](#) article, 3 November 2020) also found that the 2007-2009 Great Recession accelerated the process of job polarisation, as the demand for middle-skilled jobs declined significantly, while the demand for both high-skilled and low-skilled jobs remained relatively stable.

This has important implications for income inequality and social mobility, as workers with middle-skilled jobs are often those with lower levels of education and training.

In both pieces, Petropoulos and Brekelmans advised policymakers to focus on supporting the re- and upskilling of workers, to help them mitigate the negative effects of job polarisation and AI.

Beyond job replacement, AI can also create new tasks and jobs. In an [event](#) on 25 May 2021 David Autor (MIT) showed that 63.5% of US employment in 2018 was in job titles that had not yet existed in 1940. Over that period, employment shifted from blue-collar and office work to technical, professional and low-paid services.

Figure 2. Probability of exposure to automation of different skill groups



Note: This figure refers to the average exposure to automation of the individuals in each skill group. The average exposure is defined by the occupations individuals in each group have and their number. The exposure of each occupation is defined by the scale created by Nedelkoska and Quintini (2018).

Source: reproduced from [Brekelmans and Petropoulos \(2020\)](#).

While exposure to automation did not predict the emergence of new job titles and employment growth, occupational exposure to augmentation does. David concludes that task displacement and task creation occur simultaneously with opposing consequences for employment and wage growth.

Discussants Maarten Goos (Utrecht University) and Barbara Kauffmann (DG Employment) elaborated on the policy implications of augmenting, instead of replacing, jobs: stimulating and directing technological innovation, protecting competition, and facilitating occupational and geographic mobility.

Finally, they stressed the importance of redefining labour relations to protect job quality, wages and social dialogue in the new world of work.

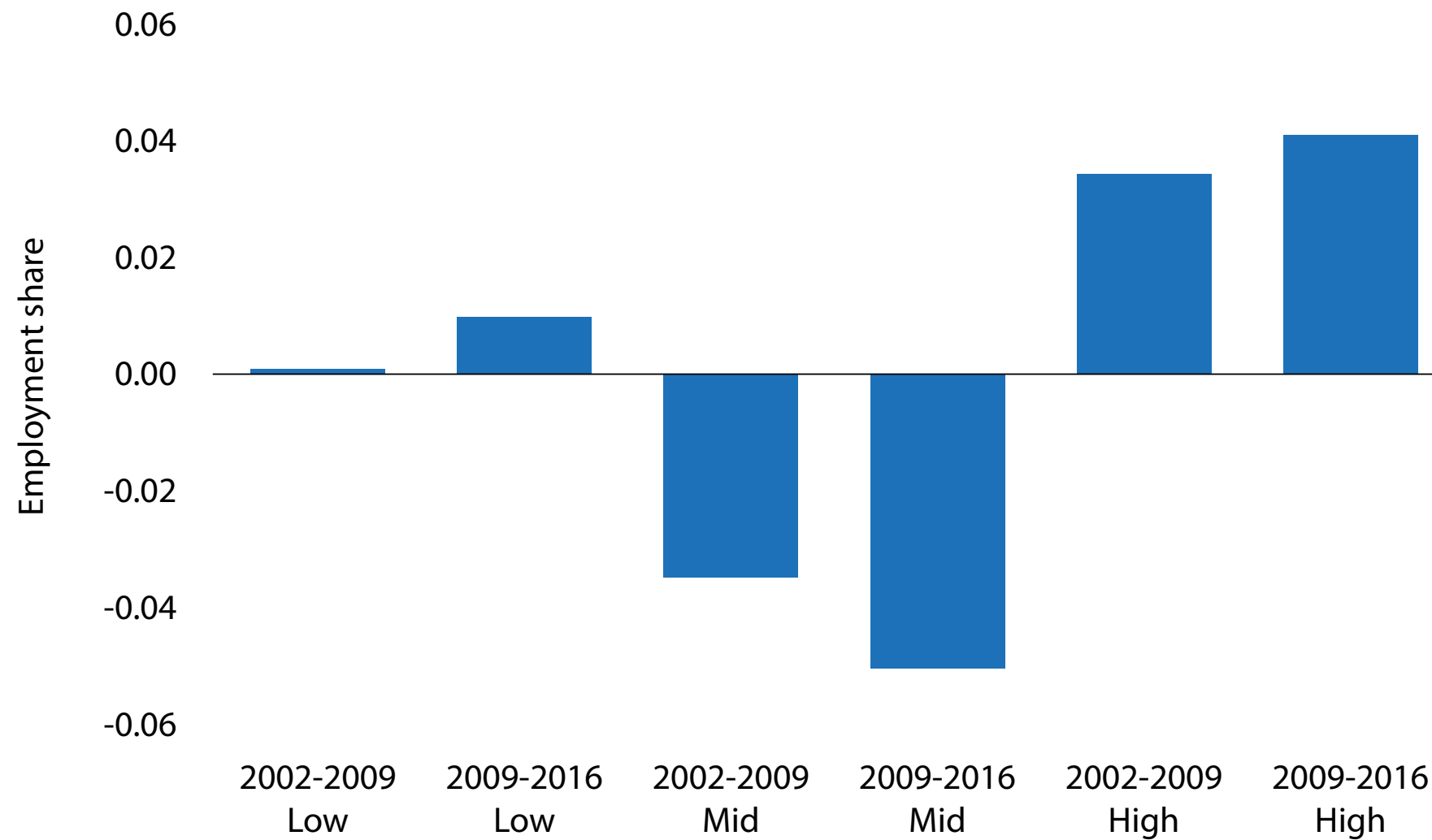
In a somewhat heterodox opinion Aaron Benanav and Alexis Moraitis argued in a [podcast](#) published on 19 July 2021 that the decline in labour demand is not caused by automation, but rather by the stagnation of the global capitalist economy.

Globalisation of the post-war manufacturing sector created an 'industrial overcapacity', pushing down prices and profit rates. While the manufacturing sector has exhausted its dynamism, the service sector – which rapidly increased in size but has less productivity growth - mostly offers precarious and underpaid jobs.

Applications of algorithmic management in the service sector put further pressure on workers. In this context, Benanav argues that Universal Basic Income (UBI) will not have strong leverage, thus other policy responses should be investigated.

In a [policy brief](#) from 5 October 2021 Rebecca Christie considered the potential for a 'robot tax' on companies that replace employees with automated systems. As a rallying concept for targeted levies, a robot tax should target

Figure 3. Change in employment shares (%) for low-, middle- and high-skilled workers in selected EU countries for 2002, 2009 and 2016



Note: For method and date refer to note of Figure 2. In this case we subtract the shares per skill level of 2002 from the shares per skill level in 2009 and shares of 2009 from the shares of 2016.

Source: Bruegel. Reproduced from Petropoulos and Brekelmans (2020).

finance and other data-driven sectors as well as traditional manufacturing and mining automation, where it can compensate for distortions due to shifts from human-driven to capital-intensive production.

Reasonable expectations should be set on the amount, time, and scale on which such a tax can raise revenue. Waivers and exemptions for small and more innovative firms should be put in place to protect innovation. Finally, any new tax on employers needs to fit with broader discussions of the corporate fair share.

At the [Bruegel Annual Meetings](#) on 6 September 2022, Laura Nurski discussed AI's labour market impact with Brando Benifei (European Parliament), William Carter (Google), Katya Klinova (Partnership on AI). As labour market outcomes of AI innovation are shaped both during R&D and during implementation inside organisations, policy should support both an ethical development of AI as well as a responsible use in the workplace.

Katya argued that AI tends to focus excessively on automation, but policy can design mechanisms to steer innovation in a labour-complementing way. Will talked about Google's responsible AI principles and their implementation and governance in the Google organisation.

Finally, Brando shed light on his proposed amendments to the AI act aimed to protect workers not only from discrimination, but also in terms of wages, working conditions and employment.

Quality: the job quality effects of AI

When exploring the changing nature of work in the context of technological change, one cannot ignore the impact of technology on job quality. Workstream 4 investigated the concept, dimensionality and measurement of job quality as well as its relationship to burnout. In this workstream, we assessed the specific impact of AI on the quality of work.

Laura Nurski first explored the topic of algorithmic management in a [blog](#) published on 06 May 2021. Algorithmic management is the use of AI to assign tasks and monitor workers. It included surveillance, evaluation and the automatic implementation of decisions, without human intervention. While designed to reduce costs and ensure competitiveness, optimising efficiency comes at the expense of worker wellbeing.

Laura concludes that algorithmic management is the twenty-first century's scientific management. To mitigate its negative effects, job quality measures should be included explicitly in health and safety risk assessments for workplace artificial-intelligence systems.

In follow-up work (a [working paper](#) published 26 July 2022 and a [podcast](#) published on 27 July 2022), Laura Nurski and Mia Hoffmann dig deeper into the link between AI and job quality.

They identify four use cases of algorithmic management that impact the design and quality of jobs: algorithmic work-method instructions; scheduling of shifts and tasks; surveillance, evaluation and discipline; and task coordination.

Their review of the evidence on automation and algorithmic management shows significant impact on job quality across a wide range of jobs and employment settings. They also illustrate how AI replicates existing power dynamics in society, risking further job-quality polarisation across socioeconomic groups.

Meaningful worker participation in the adoption of workplace AI is critical to mitigate the potentially negative effects of AI adoption on workers. Therefore, policymakers should strengthen the role of social partners in the adoption of AI technology.

Table 2. Functions of management and AI use cases

Functions of the organisation		All use cases
Governance/ management	Goal specification (vision)	-
	Task specification	Algorithmic work method instructions
		Algorithmic task coordination
	Planning	Algorithmic scheduling of tasks and shifts
	Incentivising behaviour	Algorithmic surveillance, evaluation and discipline
	Staffing	Algorithmic recruiting and selection, learning and development, promotion and termination
Production	Task execution	Automation

Source: Bruegel based on Cole and Kelly (2011), Martela (2019) and Puranam (2018). Reproduced from [Nurski & Hoffman \(2022\)](#).

The FWIG Excellence Network also contributed to the topic of digitalisation and job quality in a [working paper](#) from 22 September 2022, a [podcast](#) on 18 May 2022 and a [podcast](#) on 24 November 2021. Janine Berg, Francis Green, Laura Nurski and David Spencer examined the job quality effects of new digital technologies in Europe.

While the theoretical effects from new technologies are ambivalent across the many domains of job quality, data on robot shocks showed significant negative effects in three domains, and a positive effect in one. Some negative effects are enhanced where there is below-median collective bargaining.

The research advanced the general hypothesis that worker participation is important for securing good job quality outcomes, at both the innovation and adoption stages. ■

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Global governance of digital trade is fraught with unknowns

The US has dropped its support for unhindered international digital trade. Patrick Leblond argues that it now makes an e-commerce agreement at the WTO more likely

On October 25, the United States [announced](#) at the World Trade Organization (WTO) that it was dropping its support for provisions meant to promote the free flow of data across borders. Also abandoned were efforts to continue negotiations on international e-commerce, to protect the source code in applications and algorithms (the so-called [Joint Statement Initiative process](#)).

According to the Office of the US Trade Representative (USTR): *"In order to provide enough policy space for those debates to unfold, the United States has removed its support for proposals that might prejudice or hinder those domestic policy considerations."*

In other words, the domestic regulation of data, privacy, artificial intelligence, online content and the like, seems to have taken precedence over unhindered international digital trade, which the United States previously strongly defended in trade agreements such as the Trans-Pacific Partnership (TPP) and the Canada-United States-Mexico Agreement (CUSMA).

Although the USTR had informed its trade partners prior to the announcement, the news came as a bombshell to the trade policy and business communities in the United States and abroad; they did not expect Washington to alter its support for open digital markets and the free flow of data across borders, seen as beneficial to US firms.

The US Chamber of Commerce and many other major business associations immediately appealed to the National Security Council and National Economic Council by expressing their *"profound concern and disappointment"* about the USTR's decision, in an open letter.

Opposition to the USTR's change of heart did not just come from so-called 'big tech' (the companies that have been the main beneficiaries of the United States' previous position). A group of firms and associations representing

'startups, small businesses, and entrepreneurs in the global digital economy' also expressed deep concerns about the USTR's decision.

They pinpointed that barriers to crossborder digital trade are more harmful to them than to their bigger competitors: *"Unlike larger companies, smaller businesses with few product or service lines usually cannot shoulder the superfluous costs of data localization, technology transfer, prohibitions on encryption, and arbitrary application of regulation to American firms."*

The emergence of a noodle bowl of digital trade governance is the result of two strategic imperatives: one geo-economic, the other industrial

The irony of the USTR's decision is that it now makes an e-commerce agreement at the WTO more likely, removing the deadlock between China and the United States relating to exceptions to crossborder data flow and source code protection.

The problem is that such an agreement, if it comes to pass, will be ineffective in fostering international digital trade. As such, it **won't be much different** from the Regional Comprehensive Economic Partnership's digital trade chapter.

Where were we before?

Until the USTR's decision, the international governance of digital trade had been experiencing a proliferation of agreements. Stephanie Honey coined this trend the '**digital noodle bowl**', in reference to Jagdish Bhagwati's 'spaghetti bowl', which described the increasing number of bilateral and regional trade agreements, some overlapping, agreed to in the 1990s.

Using noodles instead of spaghetti as the metaphor is meant to emphasize that the Indo-Pacific region is the **centre of gravity** for digital trade agreements as opposed to the traditionally dominant North Atlantic region.

The emergence of a noodle bowl of digital trade governance is the result of two strategic imperatives: one geo-economic, the other industrial. According to the geo-economic logic, a country's policy decisions regarding the governance of international digital trade is driven mainly by what other countries do.

The industrial logic, for its part, implies that governments devise their digital trade policies to improve their domestic economy's international competitiveness, with limited regard for what the rest of the world does. The goal here is to position their economy as a digital trade leader, in terms of both economic activity and standards setting.

The United States' approach to the governance of international digital trade began with an industrial logic: protecting US firms' access to foreign markets by imposing, in its trade agreements, strict provisions aimed at limiting crossborder digital trade flows.

This is what we find in the TPP's (now the Comprehensive and Progressive Agreement for Trans-Pacific Partnership, or CPTPP) e-commerce chapter and CUSMA's digital trade chapter. It was also the position espoused in the WTO negotiations until a few weeks ago.

In the last couple of years, however, the United States has moved toward a geo-economic logic in its approach to governing international digital trade, in response to China and the European Union. For instance, the [Global Cross-Border Privacy Rules](#) (CBPR) Forum is both a response to the European Union's General Data Protection Regulation and an attempt to take privacy rule governance out of the Asia-Pacific Economic Cooperation because the latter includes China.

The inclusion of the Global CBPR Forum within the US Indo-Pacific Economic Framework (IPEF) is also seen as a strategic response to draw countries in the region away from China's digital orbit. With respect to IPEF's other digital trade provisions, [negotiations](#) now appear to be on hold, following the USTR's October 25 decision.

For its part, the European Union has focused on establishing a whole set of laws and regulations to govern the digital part of Europe's economy and society in an attempt to promote a digital single market within its borders. Any influence on governance standards beyond its borders through the so-called 'Brussels Effect' has been secondary and primarily aimed at supporting the European Union's internal market.

However, the European Union has recently been negotiating bilateral digital partnership agreements (for example, with Japan, Singapore and South Korea). This new approach to governing digital trade can only be understood in

response to such agreements being negotiated by other countries and the fear that it will be left out of China's and the United States' attempts to dominate digital trade governance in other parts of the world, especially the Indo-Pacific region.

China's approach to governing digital trade follows the United States' and the European Union's mixed logic. It began with an industrial logic in that the [Digital Silk Road](#) would be a means to support its home-grown digital giants in their competition with US giants in the Indo-Pacific region as well as in Africa.

More recently, however, China has responded to US actions on digital trade by asking to join the CPTPP and the Digital Economic Partnership Agreement (DEPA) between Chile, New Zealand and Singapore. Pursuing a mixed logic, it has also strengthened the governance of its domestic digital economic space to promote the latter as well as protect political stability.

Smaller countries have adopted a more polarized approach to governing international digital trade. For New Zealand and Singapore, digital trade agreements follow an industrial logic, namely, to position their economies for the digital revolution and try to influence its international governance by being first movers. The DEPA with Chile and the Digital Economy Agreement between Australia and Singapore are good examples of such an approach.

On the other side, Canada and Japan follow a geo-economic logic to international digital trade governance. In Canada's case, this [logic is driven](#) by its dependence on the US economy. Its strategic goal is to stay close to the United States to maintain necessary access to its markets while improving access to other markets to limit dependence on the US economy.

Similarly, Japan has adopted a geo-economic balancing act that aims to prevent China's political and economic domination of the Indo-Pacific region (ie. keeping it free and open) while continuing to do business with China, which is an important economic partner for Japan.

To achieve this balance, Japan has concluded bilateral digital trade agreements with the European Union and the United States. It is also party to the CPTPP, which has a chapter on digital trade (negotiated by the United States before the Trump administration pulled out).

Finally, it is a member of the Regional Comprehensive Economic Partnership, which includes China, and whose digital trade chapter is modelled after the TPP (albeit much weaker).

Where do we go from here?

One pathway for the future sees the digital governance noodle bowl getting bigger and messier. In this scenario, international digital trade suffers. Agreements continue proliferating but remain ineffective at fostering crossborder digital trade: either they remain hortatory with attempts at cooperation on non-strategic issues, or no one pays attention to the binding provisions because business can't keep up and governments want to retain their 'policy space'.

After all, why has there not yet been any dispute launched based on binding provisions in a digital trade agreement (either on its own or as part of a larger trade deal) when there has been [increasing digital fragmentation](#)?

The other pathway leads to the creation of a new international standards-setting and governance body (call it an International Digital Standards Board), like there exists for banking and finance. Countries that are members of such an international organization and effectively apply the commonly agreed standards become part of [a single digital area](#) where they can conduct crossborder digital trade without impediments. This is the only way to realize the G7's '[data free flow with trust](#)' vision, originally proposed by Japan.

This second scenario is the only way to overcome the challenges to international digital trade posed by countries pursuing different strategic logics for governing international digital trade. As impediments to digital trade add

up around the world because of an expanding noodle bowl, pressures for common international rules are likely to grow.

Ironically, perhaps, the United States' decision to abandon or suspend its historical position on some digital trade provisions to create 'policy space' for itself and others could make the creation of a plurilateral single digital area more feasible if the domestic policies that it ends up adopting are close to those of its key trade partners: for example, Australia, Canada, the European Union, Japan, New Zealand, Singapore, South Korea and the United Kingdom.

At a minimum, this scenario requires the Democrats to retain the White House and improve their position in Congress in next year's US general elections. ■

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British Virgin Islands - a strong year for transactions

The BVI is at the forefront of providing sophisticated and efficient financial services. Elise Donovan discusses how the BVI is meeting the rise in demand for specialist expertise, services, and regulation in the age of increased complexity

At the heart of our global economy lies international finance centres (IFCs) such as the British Virgin Islands (BVI). A dependable, tried-and-tested facilitator of global investment and trade, IFCs remain a stalwart for companies and individuals navigating the complex economic terrain and striving for growth and progress.

Over the course of 2023, the global economy underwent a series of changes, with technological innovations, climate-related events, and significant geopolitical conflicts contributing to increasingly complex global capital markets.

Against this backdrop, BVI financial services firms, along with our independent regulator, are stepping up to meet the rise in demand for specialist expertise, services, regulation, and structures in the age of increased complexity.

In 2023, the jurisdiction also introduced a dedicated Minister for Financial Services, Labour and Trade with this new role, specifically tasked with supporting and growing the international finance and business centre, reaffirming the governments committed to the future of the BVI's international financial centre.

Over the course of the year, BVI financial services firms were actively involved in a number of high-value, sophisticated transactions, from IPOs to acquisitions and restructurings. At the same time, the BVI has enhanced both its expertise and regulatory framework in growth areas such as virtual assets, fintech and climate finance attracting an increasing number of high-quality market participants.

Consequently, BVI firms are not only executing complex transactions now, but are also playing a pivotal role in shaping the future of international finance, underscoring the BVI's reputation as a tried-and-tested hub for global investment business across the transaction value chain.

Mergers and Acquisitions

Appleby BVI and Conyers BVI played an instrumental role in a significant international acquisition involving Shift4 and Finaro, a prominent clearing technology provider and online merchant bank in Europe. Ogier advised Fortress Investment Group on its acquisition of Vice Media Group in a deal valuing the well-known media company at £350 million (\$445 million).

This year's series of transactions across various sectors, including digital assets and climate finance, is a clear indication of the ability to adapt and excel in an evolving market

Conyers advised B2Gold Corp, international senior gold producer, in relation to an up to \$60 million purchase agreement with AngloGold Ashanti Limited to acquire AngloGold's 50% stake in the Gramalote Project, located in the Department of Antioquia, Colombia. Since the completion of the acquisition on 5 October 2023, B2Gold now owns 100% of the Gramalote Project.

Harneys acted as legal counsel to Maxpro Capital Acquisition Corp in a business combination with late-stage clinical biopharmaceutical company, Apollomics Inc. through a reverse merger. Apollomics' Class A ordinary shares and public warrants commenced trading on 30 March 2023, on the Nasdaq Capital Market under the symbols 'APLM' and 'APLMW', respectively.

Walkers acted as BVI legal counsel to NASDAQ-listed Lumentum Holdings in relation to its acquisition of Cloud Light Technology Limited for \$750 million by way of a BVI statutory merger.

Gold Leaf Consulting advised on the successful closing of a multi-million-dollar private asset sale in which a client, acting through a BVI company vehicle, was encountering procedural due diligence challenges with the recovery of escrowed funds. Gold Leaf was engaged to devise appropriate solutions, harnessing its compliance, and commercial expertise to design a successful solution for the release of the sale's proceeds.

Restructuring

The BVI's distinctive restructuring framework provides firms in the jurisdiction the ability to effectively assist in restoring business viability for companies as well as offering leading insolvency services.

Demonstrating the BVI's close links to Asia, Maples and Calder advised Sunac China Holdings Ltd on the successful restructuring of its \$10.2 billion offshore debt, representing the largest debt restructuring by a People's Republic of China real estate company to date.

Conyers BVI acted as counsel to All Year Holdings Limited to complete the successful restructuring of the Company and conclude the Provisional Liquidation which was commenced in December 2021.

Capital and funding

BVI's financial services firms hold decades of experience in capital and funding, harnessing this expertise to support and grow emerging sectors and markets.

Conyers advised long-standing client, Commonwealth Bank of Australia in connection with a five-year AU\$500 million (\$329 million) syndicated credit facility to Gold Fields Limited as borrower. This was one of the first sustainability-linked loan transactions in the Australian mining industry and the first for a gold mining company in the country.

As part of the transaction, Gold Fields committed new social and environmental targets by embedding ambitious targets in a new sustainability-linked loan backed by a syndicate of 10 Australian and international banks.

Conyers also advised Telegram Group Inc in connection with its issuance of \$210 million bonds. The Dubai-headquartered firm operates an encrypted messaging app used by over 800 million users each month as is a hugely influential company in the TMT sector. The capital, to be used for expansion, was raised through bond sales from multiple investors.

The firm further acted as BVI counsel to SIBA Energy Corporation on its DOP 4.1 billion (\$68 million) project financing in respect of the financing, construction and commissioning of a combined-cycle gas fired power plant, including related sponsor arrangements.

Walkers acted as counsel in a major Norwegian cruise line transaction, acting as BVI counsel to NCL Corporation Ltd., a subsidiary of Norwegian Cruise Line Holdings Ltd., on its recent issue of up to \$900 million in aggregate principal amount of first-lien senior secured notes.

Carey Olsen advised Socket Technologies Limited on its \$5 million investment round. The firm's fintech and digital team acted as lead legal counsel and advised on all BVI corporate, finance and regulatory aspects of the funding round, which was led by Framework Ventures and Coinbase Ventures, the venture arm of Coinbase.

Initial Public Offerings

Harneys advised on the successful initial public offering (IPO) of special purpose acquisition vehicle (SPAC) Pono Capital Three, Inc. for \$115 million. The IPO was over-subscribed with proceeds to be used for continued growth and supporting acquisitions with a focus on high growth consumer goods businesses in Asia and beyond.

Digital assets

In the evolving landscape of international finance, digital assets are gaining growing significance. Utilizing its globally renowned regulatory framework and forward-thinking ecosystem, the BVI has emerged as a pioneer in the industry, excelling as a leader in integrating new regulations into financial processes.

For example, since the coming into effect of Virtual Assets Services Providers (VASP) legislation last year, BVI Financial Services Commission has received more than 70 applications from entities and businesses in the digital space eager to establish in the jurisdiction.

By establishing a new legal framework for registering and overseeing individuals involved in virtual asset services, this structure aims to enhance the BVI's offerings and cement its reputation as a reliable hub for digital assets.

BVI firms were instrumental in several significant developments in the sector in 2023. Harneys BVI worked in collaboration with Harneys in a partner jurisdiction for 3iQ, one of the world's leading digital asset investment fund managers, on the launch of the industry's first comprehensive suite of crypto hedge fund managed accounts through the 3iQ Managed Account Platform (QMAP), with Harneys BVI acting as lead counsel on the establishment of QMAP's BVI approved manager. The platform will launch with \$50 million of capital from 3iQ and institutional investors.

Teneo BVI played a critical role in one of the most significant developments in digital assets in 2023; the liquidation of 3 Arrows Capital (3AC). In December 2023, a BVI Court froze around \$1 billion in assets belonging to the founders of 3AC, to prevent the founders dealing with assets in a way that might limit enforcement of the liquidation.

Conclusions

The BVI has always been at the forefront of providing sophisticated and efficient financial services. This year's series of transactions across various sectors, including digital assets and climate finance, is a clear indication of the ability to adapt and excel in an evolving market. This success reaffirms its position as a leading financial centre, dedicated to supporting the global economy. ■

Elise Donovan is the CEO of BVI Finance



The rapid growth of hybrid learning

Lili Gu, Martin Lockett and Yangyang Jiang write that hybrid learning with simultaneous online and face-to-face delivery is no longer just a response to the COVID-19 disruption but is now a strategic option for business schools

The effectiveness and potential of hybrid learning is still being explored, as it differs from both blended and online learning. This method of ‘simultaneous learning delivery to offline and online audiences’ came to prominence during the pandemic.

A recent 3-year study in China, focusing on the perceptions of teachers, looked at its potential benefits, especially flexibility and expanding access to education, and its challenges, such as effective online engagement of those studying in differing physical and social settings. The authors argue that hybrid learning is not just a technology add-on, an explicit hybrid pedagogy and institutional support are required to realise its full potential.

Hybrid learning is increasingly utilised worldwide to enhance learning and provide students with new educational experiences and opportunities. Although not new, it expanded rapidly as a response to the challenges of maintaining educational provision during the COVID-19 pandemic.

Hybrid learning is now evolving into a mainstream approach within higher education, especially when learners want flexibility in where and how to learn. Rather than seeing hybrid learning as a second-best or emergency option, it is a strategic option for business schools about which relatively little is understood from both theoretical and practical standpoints.

The initial disruptive effect of COVID-19 was to force educational institutions to go 100% online to ensure the continuity of learning. Then, hybrid learning rapidly formed part of subsequent strategies, as educational institutions sought to provide learning simultaneously to both those who were able to return to campus (or other face-to-face learning locations) and those who were unable or unwilling to return due to travel restrictions and/ or personal safety concerns.

This dramatically accelerated the adoption of hybrid education, which is now recognised as a sustainable mode of delivery that can enhance the resilience and flexibility of business education.

Hybrid learning can be defined as 'simultaneous learning delivery to offline and online audiences', which is distinct from blended learning, in which a planned combination of online and offline learning is delivered to a single audience. Online and blended learning have been extensively studied over the past decade.

For institutions, management systems developed for traditional education may not be effective for hybrid learning

However, while growing rapidly in importance, there has been little research into hybrid learning. Our research and practical experience covers hybrid teaching and learning over a three-year period, based in China.

In many ways, China is a 'leading' country in implementing hybrid learning, given that there have been periodic lockdowns in some parts of the country but not others. Also, due to government travel restrictions, international students were unable to travel or return to China for almost three years even when domestic students were almost all on campus.

Our analysis is based on both research and practice. A first qualitative research study was conducted with over 20 teachers engaged in hybrid learning. The purpose was to understand the hybrid learning approach in practice and provide new insights into its benefits and challenges, what influenced its effectiveness and its future potential.

A second study, again involving over 20 teachers and leaders, focused on course learning design and institutional support for hybrid learning in a wider range of institutions. The overall approach focused on teachers' perceptions. In-depth interviews were conducted with respondents' perceptions of hybrid learning strategies.

In parallel, the authors were all personally engaged in hybrid teaching and one in overall leadership of the school's work. Based on this, the opportunities and challenges of hybrid learning were identified, as well as its potential relevance to future business education.

Benefits of hybrid learning

There was a general view that teachers could not just replicate what they had done previously either face-to-face or virtually. Hybrid learning was seen as a new and different mode of delivery. With a few vocal exceptions, teachers identified a range of potential benefits:

Learning model	Location	Predominant mode(s)*
Traditional learning	On-campus	Synchronous
Distance learning	Off-campus	Asynchronous
Blended learning	On OR off campus	Synchronous + Asynchronous
Hybrid learning	On AND off campus	Asynchronous

Resilience

During periods of disruption, a hybrid approach catered best to the needs of most students who were expecting face-to-face education, as well as to staff unable to be on campus.

Flexibility

Especially for students not on campus full-time, hybrid learning gives greater accessibility to education and increases the potential reach of education programmes. For example, one teacher saw that, *“Institutionally, from a marketing perspective, it allows the university to enrol international students who can’t come to the campus.”*

Pedagogical diversity

The technology-enhanced environment of hybrid learning stimulated a shift in teaching style and pedagogy, bringing virtual technology into education and 'forcing' staff to review their previous pedagogical assumptions and techniques.

Educational equity

Although still different in terms of methods and complexity, it enabled fair treatment of diverse students in the same class at the same time. Moreover, a potential social benefit was that it makes education more accessible to those who cannot afford to attend a fixed study location.

A further benefit during the early stages of the pandemic in 2020 that resulted from the rapid implementation of virtual learning followed by hybrid learning was a dramatic acceleration of faculty members' digital capability. Our school's three-year faculty development plan was achieved in under three months!

Challenges of hybrid learning

Compared with other modes of learning in which students' environments are similar, teachers need to consider the very different environments in which students are located and the need to simultaneously balance both online and offline students. Interaction becomes harder for students, especially those online, and they need to be more motivated. Moreover, the simultaneous implementation of online and offline student interaction becomes more difficult.

The challenges of hybrid learning as implemented in practice are substantial and can be categorised into five dimensions:

Learner dimension

Over two-thirds of respondents perceived that online students were mostly silent and were less motivated. Student engagement and offline students recognising the 'presence' of online students were examples of learner challenges. Students had different needs and abilities as well as different physical and social settings.

Instructor dimension

Hybrid learning placed major demands on teachers. 86% saw a lack of management/institutional recognition of the extra work involved, such as the demands in the classroom of managing the different learning experiences of online and offline students as well as dealing with somewhat unreliable technology.

Curriculum dimension

Nearly three-quarters of teachers found that even basic forms of interactivity were difficult to maintain when attempting to engage both online and in-person students in a similar way. The lack of an explicit hybrid pedagogy was also a concern. In our university, the focus of staff training was almost exclusively on technology mechanics rather than pedagogy.

Technology dimension (controllable)

As most classroom types of equipment were not designed for hybrid learning, 77% of respondents said that there was a lack of fit between classroom technology and hybrid learning. Two-thirds of respondents mentioned that even when familiar with the technology used, they still had technical problems during its operation.

Environment dimension (unpreventable or unpredictable)

It was hard to guarantee that the internet environment was always 'up'. When international students were in

countries where the network was unstable, issues could not be controlled or resolved by the university. More than half of teachers saw that such technical failures could happen for apparently 'no reason'.

For institutions, management systems developed for traditional education may not be effective for hybrid learning. Expecting teachers to set up a hybrid learning environment in a 10-minute break between scheduled sessions was often insufficient and meant that teachers focused on technical issues rather than on the content of the class. Comparable assessments of the learning outcomes of both online and offline students can be problematic unless well thought-out for fairness and effectiveness, for example shifting presentations to video.

Overall, without new approaches and support, the demands on teachers are significantly increased in both learning design and educational delivery in ways that can lead to a worse experience for both online and offline students compared with distance learning and traditional learning.

Strategic options for business schools

Our research and experience shows the potential of hybrid learning to drive forward both access and flexibility for learners, as well as resilience to disruption. Given the lack of conceptual clarity around the difference between blended and hybrid learning, confused policies and practices may be adopted that make incorrect assumptions about the nature of hybrid learning.

It also shows the danger of managing hybrid learning as a technology add-on to existing learning approaches. Institutions, therefore, need to make strategic choices about whether hybrid learning is: (1) a stop-gap measure to maintain access in a pandemic in which case quality is a secondary issue, or (2) a new form of learning delivery distinct from distance and blended learning that requires rethinking of pedagogy and the learning environment to be successful.

In our view, hybrid models become most valuable when they are used to create access to new groups of students who cannot always attend in person and want flexibility to arrange their time. Examples are part-time students with variable working patterns, students on internships and those who do not want or cannot afford full-time on-campus study. Whether or not to offer hybrid options and for which courses is an important strategic decision.

Making hybrid learning a success will require resources and management time as well as teaching delivery models with improved staff support and sufficient resources. It will require development of a pedagogy of hybrid learning based on the experiences of teachers and students.

Design of physical and virtual environments for the different needs of hybrid learning will also be challenging as it is not an 'add-on' to either face-to-face or online learning. But despite these challenges, hybrid learning can offer new opportunities to enhance business school education and be a positive side-effect of the COVID-19 pandemic! ■

Lili Gu is a doctoral student, Martin Lockett is Professor in Strategic Management and former Dean, and Yangyang Jiang is Associate Professor in Marketing, all at Nottingham University Business School, China

Building for the future

WCR interviews Josephine George, Managing Director of the Bank of St Helena, the recipient of the *Best Bank for Financial Inclusion 2024* and *Best Bank Startup in 21st Century* awards, who discusses the bank's use of new technology to support customer experience



The Bank of St Helena has a vision to be known as the financial cornerstone from which their customers can confidently build a sustainable and prosperous economy for the Island of St Helena. Their mission is to develop and deliver banking products and services that are appropriate, affordable and accessible to all to enable sustainable development. *World Commerce Review* interviews Josephine George, Managing Director of the Bank of St Helena, the recipient of the *WCR* awards *Best Bank for Financial Inclusion 2024* and *Best Bank Startup in 21st Century*, who discusses the Bank's use of new technology to support customer experience.

The Bank of St Helena Tourist Card will help drive high value ecotourism. Please describe the overall benefits to the jurisdiction.

One of the most remote islands in the world, St Helena is truly a remarkable place to visit with its subtropical climate, mountainous terrain and micro-climates that creates an astounding diversity of landscapes. It has frequently been

labelled as 'a bucket list destination', 'unspoilt' and a 'breath of fresh air', recently recognised by the international marine conservation non-profit Mission Blue as a Hope Spot in honour of the islands' ongoing initiatives to manage and monitor its marine environment as well as grow a sustainable economy. Bank of St Helena endeavours to play its part in ensuring visitors enjoy the overall experience by supporting their banking needs.

The introduction of the St Helena Tourist Card in 2023 has been a wonderful and exciting addition to the current suite of banking products offered. Designed to meet customer needs in the absence of normal mainstream banking methods, it has enabled visitors to travel with ease knowing they can have access to their funds at any time for whatever experience St Helena has in store for them.

As a virtual e-wallet product, visitors manage their finances before leaving their homes for the long trek to the island. The use of the Tourist Card can start upon arrival for those who require to pay an entry fee. Prior to the card's introduction, paying by cash was the norm, not just when entering, but for most of the St Helena experience. This virtual alternative has reshaped the financial norm for both tourists and the island's tourism sector and was the island's first step to virtual banking for tourists.

The Tourist Card utilises the local payment platform 'St Helena Pay', the majority of local businesses on the island readily accepts the Tourist Card which has allowed an expansion from a local customer base with new visitors coming in to the island with each flight, equipped with their Tourist Card. This has also been a welcomed change for our sister island Ascension, 700 miles north of our location where Bank of St Helena resides as the main banking hub for the small community, allowing their visitors to tap into the Tourist Card.

We developed the Tourist Card to be user friendly with a quick and straight-forward registration process, users can top-up their balance, view their transactions and unload funds back to their banks when on-island, or after their trip. Their full journey can be viewed with ease on their app or online portal.

Since its introduction, we have noticed an increase in tourism-based businesses offering St Helena Pay to ensure they offer a banking alternative to our visitors who arrive equipped with their Tourist Card. By better serving their customers and enhancing the visitor experience, this has transitioned into a greater benefit to all. Once they get a taste of what St Helena has to offer, we fully anticipate our visitors to return and the Tourist Card is ready for them when they do.

What personal development goals have you implemented to boost your team and improve customer care and staff careers?

Improving customer standards and career development is a driving force within the bank and we recognise personal and professional development is critical to the Bank's success. Besides having personal development plans for staff, Bank of St Helena has the good fortune to be supported by an excellent workforce who are dedicated to providing the highest standard of customer service. We support the commitment to training and development initiatives to develop skills to meet the ever-growing demands of regulations development and customer expectation.

The development of products by the Bank has a large element of staff input at various stages hence encouraging support at roll-out. The introduction of the Tourist Card has been no different, staff proudly assisting in its promotion and this along with marketing support by other stakeholders locally and internationally has driven the success of the card in its first year.

Your banking booths ensure financial inclusion for remote areas and out of hours service. Please describe the thinking behind this.

Up until October 2023, access to affordable internet communication was somewhat stifled for the island community and the Bank knew many of our customers were unable to take full advantage of the digital products we had on offer. Additionally, recognising the local demographics showed an aging population with many of these customers living in outlying areas, thus coming into the island's capital, Jamestown presented a number of inconveniences.

The Bank decided to take banking to these customers through a scheme we call 'Remote Banking', this service is provided at various 'satellite offices' around the island once a month to facilitate the in-person payment of bills, drawing of cash and other essential banking services required by the island population.

With more customers now utilising digital methods for payment such as online banking which is available 24/7, and Local Debit Cards with St Helena Pay, cash is not in as great demand as it had been previously. The Bank constantly reviews such services and will adjust its service offering in line with the island's development.

What new initiatives are planned and under way?

Bank of St Helena recognises that the banking landscape is transforming dramatically and is influenced by technological advancements and changing customer behaviours, therefore, we are working towards modernisation of services to support customer's expectation and the island's national strategic objectives.

With the first anniversary of the Tourist Card fast approaching, the Bank is developing enhanced features to the product functionality to mark this milestone. Capitalising on the enhanced internet connectivity introduced just six months ago, the next exciting project is the introduction of a Mobile Banking app for our local online banking customers, to include also our Local Debit Card app, offering a virtual payment option for the local community alongside the Tourist Card.

With the accessibility of better internet connectivity, the Bank will look to embrace cloud services to improve operational efficiency and security, and where possible, look to improve on current products and services offered. ■

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

Asbestos 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 20th 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 workers¹.

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](https://doi.org/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 GDP².

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 years³.

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*⁴ and a proposal to revise the Directive on the protection of workers from the risks related to exposure to asbestos at work⁵.

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/m³ to 10,000 fibres/m³.

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/m³ back in 2017⁶, and the European Parliament, in a resolution adopted in 2021 and only recently in its report on the review of the Asbestos at Work Directive⁷, has called for the European limit value for asbestos to be reduced to 1,000 fibres/m³, 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 deathly legacy of asbestos will be passed on to the next generations. ■

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Endnotes

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Interpreting the Dutch general election

The Dutch election could be a litmus test for 2024 elections. Patrick van Schie provides an insight into the November election

2 024 will be a year of national elections around the world. In the recent presidential election in Taiwan, Beijing's attempt to influence the result by undermining support for the party in power did not succeed; their candidate was elected, albeit with a reduced majority.

The contests still to come this year range from fake elections, like the presidential one in Russia (March), to various elections in genuine democracies, such as the United States (November), South Korea (April), Belgium (June) and probably Great Britain as well at some point. There will also be elections for the European Parliament in June.

In a way, the general election which took place in the Netherlands on 22 November 2023 can be seen as an indicator for what might be about to happen more widely in Western democracies, viz. a massive shift to the right. This means that an insight into what really influenced the Dutch election in November could be very illuminating. Has the hard-right won, as many in the media have reported? Is the democratic constitutional state at risk, or is the global situation not really so alarming?

The left, smaller than ever before

Parties on the political left – ranging from the once fairly large social-democratic PvdA and the extreme left (once Maoist) Socialistische Partij to D66, who call themselves social-liberal but have increasingly moved further to the left, and the reformed political party ChristenUnie, which inclines to the left – have never secured a majority of votes in the Netherlands.

If we confine our analysis to the period since the Second World War, we can see that, for the first 25 years, the parties on the political left jointly polled about 35% of the vote. From the 1970s onwards, this grew to reach levels typically between 40% and 45%, with two peaks occurring of nearly half of total votes. The last of these peaks happened in 2012, and the political left has gone downhill rapidly ever since.

In November 2023, all the parties on the left of the spectrum taken together won no more than a third of the votes, and their seats in the House of Representatives were distributed between no fewer than seven parties. This is the weakest position the left in the Netherlands has been in since 1922.

As is the case in many modern Western countries, the political left in the Netherlands is having to face the effects of a dwindling working class which, for that matter, was always small compared to other Western European countries.

If the clear course signalled by Dutch voters on 22 November is wilfully ignored by the politicians, it is that which should be considered a deficiency of democracy

However, if we interpret the traditional target group of the social-democratic parties in a broader sense to include workers from the lower middle class and those in receipt of social benefits, it is striking to see how quickly the left has also lost the electoral support of these groups.

The fact that the social-democratic PvdA entered the latest elections as part of a joint electoral list with GroenLinks has contributed to this decline. The latter party is particularly popular among those with a relatively high standard of education, who consider themselves to be more cosmopolitan and worldly-wise. Their support seems to have chased away the last vestiges of less well-educated PvdA voters.

At the time of the 2021 election the PvdA still had a few strongholds in the northern parts of the country, but these voters too seem now to have mostly turned towards centre or right-wing parties.

In common with many Western countries, the political left in the Netherlands is still largely in control of the mainstream media, most university faculties and numerous NGOs. Dismay is prevalent among these groups at both the fact that the political left has dwindled so dramatically, and at the success of Geert Wilders' PVV in the recent elections (to which we will return).

Even after two and a half months (the time at which I write) many people have yet to come to terms with the blow. However, any tendency to want to put their own house in order – where did we fail? – is not much in evidence; instead, it is the voters who get the blame.

It is they who have failed to understand, and it will have to be more effectively explained to them – yet again – why politically-left plans are so much better for them. Surely then they are bound to repent, and will undoubtedly cast their votes to the left 'as usual'.

This particular way of thinking is expressed openly by many leftist politicians and journalists. The political party GroenLinks has even gone to the lengths of organising demonstrations against the results of the election in a number of Dutch cities.

Although it is seen as entirely justifiable to condemn Trump for never having accepted his electoral defeat in 2020, there is something of a blind spot when it comes to recognising that the mental disposition of the political left in the Netherlands can hardly be called any sounder.

A volatile electorate

Capturing more than 19% of Dutch votes, in March 2023 the Farmer-Citizen Movement (BoerBurgerBeweging – BBB) emerged from the Provincial Council elections as the largest party [see [my article](#) in *WCR Summer 2023*]. Only 4.5% of that impressive share of the vote remained after the elections of 22 November. Where had all those voters gone?

The impressive vote for the BBB in March was largely a manifestation of protest. The cabinet's plans to reduce nitrogen emissions were a key political issue at the time, and the BBB gave voice to the protests raised against those plans, which were aimed at shrinking the livestock population and might possibly even have slapped compulsory purchase orders on farms.

This protest was also supported by many citizens not employed in the agricultural industry. Why? Because not only did those citizens object to the measures to curb nitrogen emissions, but a number of the other measures proposed would have profoundly impacted the everyday life of all citizens, affecting the ways in which they would be permitted to heat their homes (no gas), what they would still be allowed to eat (no meat) and where they should spend their holidays (no flying) right down to the traditions they would still be allowed to keep (no Sinterklaas

celebration that included a Black Pete) and their attitude to their national history (they are supposed to feel ashamed due to the country's former links with the slave trade).

After all, although the political left had never achieved a majority in the Netherlands, their policy had largely been determined in the past by the agendas of two left-wing coalition parties – D66 and ChristenUnie – who had required, in return for their support for co-government by the liberal VVD and the Christian-democratic CDA, a policy aimed at re-educating citizens to render them climate-conscious, animal-friendly and inclusive (a people with an aversion to anything smacking even remotely of national pride). Henceforth, the population would be expected to lead a more blameless and 'politically correct' life.

On 22 November 2023, a growing dislike of this left-leaning political agenda coincided with popular resistance to the apparently incessant flow of migrants into the country, the general consensus being that this definitely did not consist only of genuine refugees, but was, for the most part, composed of economic migrants from countries officially designated as safe.

Furthermore, there had been a number of scandals in the Netherlands relating to government interventions affecting citizens. The cause was actually situated in an over-ambitious government which could obviously not make good its promises. For that matter, few political parties have drawn the conclusion that a responsible government should promise less and focus more on its core responsibilities.

Some of the disaffected now favoured the new party of a Christian-democratic dissident, Pieter Omtzigt, who, in his capacity as a Representative, had used his clout to defend citizens who felt they had been crushed by governmental institutions.

His party, New Social Contract (NSC), and the PVV of Geert Wilders were the big winners of the elections for the House of Representatives. The NSC, still a newcomer, secured 13% of the votes, while the PVV soared from 11% in 2021 to more than 23% in November 2023.

There are hardly any true-blue voters left in the Netherlands. This also goes for PVV and NSC voters, who do not necessarily subscribe to all the manifesto aims of the parties they have voted for. Whereas PVV voters are mainly intent on stemming the flow of immigrants and a cabinet with a more right-wing feel, NSC voters consider it especially important that citizens are taken seriously and want to see a reduction in governmental red tape and control from The Hague (the seat of Dutch government).

Apart from a small core electorate, neither of these parties can be sure that their supporters in November will vote for them in a future election. This high degree of volatility in the electorate is uncomfortable for political parties, but can at the same time be seen as highly democratic, in the sense that most voters will make a fresh assessment each time as to which party deserves their vote.

Did the Netherlands vote far-right?

Judged on their manifestos and party leaders, both the NSC and BBB are essentially centre-right parties. The NSC's view of society and manifesto exhibit many similarities to the traditional ideological framework of the Christian democrats.

Not surprising really, since both its leader (Omtzigt) and quite a few of its new members in the House of Representatives have their roots in the Christian-democratic CDA. That CDA, however, has now totally collapsed. The three parties from which the CDA arose in 1980 could claim roughly half of the electorate between 1918 (when

the general voting right was introduced in the Netherlands) and 1967, but in November 2023, the CDA polled a paltry 3.25% of the vote.

By November, the BBB had relapsed into its core: a farmers' protest movement. Before its brief meteoric rise, BBB constituents had largely cast their votes for the CDA, and to a lesser extent for the VVD.

But what about Wilders and his PVV? Is that not an extreme-right party? Leftist journalists and politicians think it is, which is why they are sounding the alarm, just as [Aurelien Mondon](#) did in an edition of *World Commerce Review*. With a single denominator, he classified Wilders and his party with other 'far-right' parties, and raised the alarm about 'the threat they pose to democracy'.

It is a fact that in the past Wilders had been in touch more than once with people like Marine le Pen, Filip de Winter and Viktor Orbán. Without a shadow of a doubt his party is anti-Islamic; not because it is racist, but because Wilders considers that Islam poses a threat to the Western way of life and to its freedoms. He perceives Islam to be the manifestation of a dangerous fascist ideology rather than a religion proper.

Despite all this, there are definitely two PVV characteristics that distinguish the party from what is generally denoted as extreme-right. First, there is no indication that Wilders has an anti-democratic frame of mind.

Following the results of the election, as during the campaign, he made it abundantly clear that he realised he would have to form a coalition in order to be able to govern, that he would have to accept compromises, and that although future elections may yield profit for him, they may just as well bring loss.

In the past, he has never disputed less favourable electoral outcomes. Second, Wilders does not have an anti-Semitic past, quite the contrary. Up to now he has been an outspoken advocate of support for Israel, especially after the horrific terrorist attacks committed by Hamas in Israel on 7 October 2023.

Indeed, the very demonstrations by the left in which the anti-Semitic Hamas slogan 'from the river to the sea...' was chanted probably contributed to the electoral victory of Wilders and the PVV.

None of this means that we should not find fault with the outspoken and often deliberately provocative statements that Wilders undoubtedly made in the past, or with some of the points in his manifesto. Quite a few of the new Wilders voters have indicated in opinion polls that they consider some of his past statements 'too outrageous', and hope that he won't be able to implement his manifesto in full.

The chance of that happening is frankly non-existent, if only because the Netherlands is a country governed by coalition. No single party can govern alone thanks to the voting system of proportional representation with no electoral threshold (and without the advantages for large political parties that apply in countries such as Italy and Greece).

No single party in the Netherlands has ever secured more than a third of the total vote. The highest number of seats ever secured in the House of Representatives by a single party was 54 (of a total of 150). That was the number the CDA still managed to reach in 1986, and again three years later.

Although a somewhat pompous CDA member of the House of Representatives affirmed at the time 'We rule this country', the CDA also had to look for coalition partners in order to be able to wield power.

The envisaged coalition, attempts at the formation of which are currently being made, will consist, one way or another, of four parties. In addition to the PVV, these are: the NSC, the BBB and the liberal VVD (the party led by Prime Minister Rutte between 2006 and 2023).

It has been said that more than three quarters of the Dutch people did not cast their vote for Wilders – which is true – but opinion polls have shown that more than 80% of those who voted for the VVD, NSC and BBB want a right-wing coalition with the PVV, so such a coalition is clearly the preference of a majority of Dutch voters.

If such a coalition were to be effectively realised, things would definitely be set to change; a less pushy green culture and nitrogen policy, a more restrictive immigration policy and the renewal of a more EU-critical attitude are the least we can expect. When the time comes, people must make of that what they will according to their own political preferences.

I, for one, do not shy away from predicting at least three things in the event of such a coalition being achieved. First, that any policy likely to be implemented can only be dubbed 'extreme' by those who themselves have adopted an ultra-radical leftist line.

Second, that it is as yet unclear whether voters will see precisely the policy they voted for supported by a majority, but that for the time being they can rely on being liberated from unrelenting meddling in their private lives. And third, that democracy in the Netherlands is not at risk in the foreseeable future.

If, on the other hand, attempts to shape a cabinet underpinned by the PVV, VVD, NSC and BBB fall flat on their face due to reluctance on the part of any of the parties, opponents of an allegedly 'radical-right' will no doubt be jubilant. Such an eventuality would not, however, lead to some sort of 'back to normal' situation, but would only

increase the appeal of the PVV. If the clear course signalled by Dutch voters on 22 November is wilfully ignored by the politicians, it is that which should be considered a deficiency of democracy. ■

Patrick van Schie is a historian and Director of the TeldersStichting, the liberal think tank of the Netherlands

Author's note: It must be made clear that he is in no way connected with the PVV, NSC or BBB. He has tried, in this article, and also on the basis of opinion polls and exit polls, to understand the actions of voters in order – as a scientist – to be able to provide a picture of the Dutch political landscape that is as correct as possible.

From the Great Divergence to South-South divergence



The long era of the Great Divergence has come to an end.
Ewout Frankema argues that we need to focus on the
economic divergence across the Global South

The Great Divergence debate has been the field-defining conversation in economic history for the past 25 years. This debate revolves around the question why the Industrial Revolution originated in Western Europe, and more specifically in Britain, and not in China, India, or Japan. By unifying scholars around this comparative research agenda, the debate has done much to globalise the field of economic history and to stimulate the construction of world-spanning databases on historical GDP, real wages, skill premiums, government revenues, terms-of-trade, human capital, land use, and more.

Such data collection and estimation efforts, in turn, have provoked heated discussion on the methodological and theoretical underpinnings of income and welfare measurements, and on the critical importance of reciprocity in comparative economic historical analyses.

As is the case for all major academic debates, however, at some point of their life cycle decreasing marginal returns are inevitable. Once original questions fade as new adjacent windows of exploration open.

Moreover, the long era of the Great Divergence – which is primarily, but not exclusively, understood as a Eurasian phenomenon – has come to an end with the rapid economic ascendance of Eastern Asia, and China in particular.

As Ken Pomeranz already observed in his seminal book *The Great Divergence* (Pomeranz 2000), the last quarter of the 20th was characterised by impressive rates of convergence, not divergence. In light of both developments, the academic and the historical, in a recent paper (Frankema 2023) I ask: what are the new comparative horizons in global economic history?

Beyond the Great Divergence

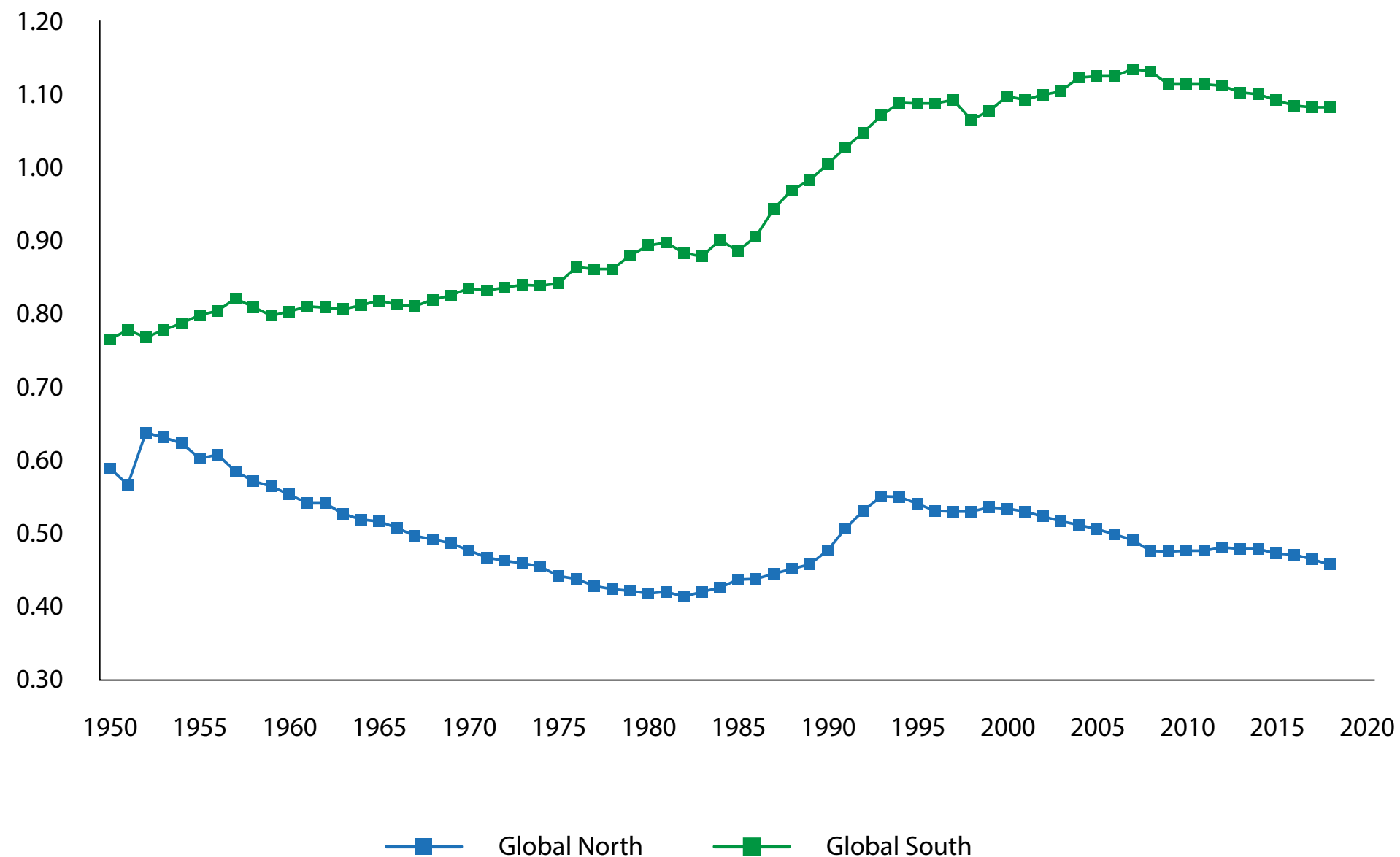
I argue that there is an urgent need to focus on the rapid, and more recent, economic divergence across the Global South. I refer to this new divide as South-South divergence. As the Eurasian gap in economic, industrial, and

technological capacity began to shrink, the South began to experience growing disparities in labour productivity and per capita income.

This process of South-South divergence is illustrated in Figure 1, which shows the coefficient of variation of per capita GDP in the North and the South since 1950. In the South the income disparities widened, while in the North they narrowed, a trend that was only temporarily interrupted by the disintegration of former communist economies during the 1980s and 1990s. This phenomenon of South-South divergence warrants more attention than it has received thus far.

Economic historians have yet to define an agenda to analyse the causes and consequences of divergence in the Global South

Figure 1. Coefficient of variation of per capita GDP in the Global North and Global South, 1950-2018



Note: The coefficients of variation in GDP per capita are taken from a constant sample of 40 Northern and 105 Southern countries listed in Appendix 1. The Global South excludes the oil-rich Gulf Countries; the Global North excludes the former Soviet states that gained independence in the 1990s.

Source: GDP per capita from Maddison Project Database 2020.

To be sure, the attention that has been devoted to the economic history of developing regions has greatly increased over the past two decades. New research networks, conferences and journals have been established.

However, for the most part, these research communities have lacked an explicit trans-regional comparative agenda. They have made great progress on debating topics such as Latin American inequality, African colonial legacies, Middle Eastern culture and religious institutions, or comparative patterns of Asian industrialisation, but seldom do these communities venture out to discuss the nature and drivers of cross-regional divergence. Economic historians have yet to define an agenda to analyse the causes and consequences of divergence in the Global South.

Why care about South-South divergence?

Let me offer four reasons. First, whereas the Global South today already comprises more than 80% of the world population and generates close to 60% of world GDP, its demographic and economic weight is bound to increase further during the 21st century.

By 2100 the North is projected to hold just 12% of the world population, while Asia and Africa together will harbour more than 80% of the world population. The share of world GDP that will accrue to the South is projected to rise from 57% in 2020 to 72% in 2050.

Second, this reconfiguration of global economic gravity is having profound implications for global divisions of labour, capital flows, trade, food demands, investment, and migration patterns.

In fact, one of the most important consequences of South-South divergence has already materialised: the problem of extreme poverty, which had long been a predominantly Asian phenomenon, has shifted decisively towards sub-Saharan Africa.

Table 1. Population and income shares per world region, 1820-2100

	1820	1850	1900	1950	2000	2050	2100
Population							
Asia	0.66	0.62	0.53	0.54	0.60	0.53	0.43
Africa	0.06	0.06	0.06	0.09	0.14	0.26	0.39
Europe	0.22	0.24	0.28	0.23	0.12	0.08	0.06
Americas	0.03	0.05	0.10	0.14	0.14	0.13	0.11
Global South	0.74	0.71	0.64	0.67	0.80	0.86	0.88
Global North	0.26	0.29	0.36	0.33	0.20	0.14	0.12
GDP							
Global South	0.58	0.46	0.28	0.26	0.43	0.72	-
Global North	0.42	0.54	0.72	0.74	0.57	0.29	-

Note: Europe includes all former Soviet republics and Central Asian states; Asia includes New Zealand and Australia.

Source: 1820-1900 from Maddison Project Database 2020; 1950-2100 from UNDP, World Population Prospects, 2022 revision, medium variant.

While back in 1990 more than four out of five of the world's extreme poor were living in Asia, in 2020 two out of three of the world's extreme poor lived in Africa (ca. 65%).

Third, economic history students who have to be trained in recognising, studying, and interpreting the drivers of long-term divergence and convergence will have to be introduced to these global shifts in order to make sense of them. But where is the literature that we prescribe to teach the chapter on South-South divergence?

After all, the Great Divergence did not just end with the era of the Great Convergence (Baldwin 2016), it also shifted the locus of global inequality, a shift that is reconfiguring the 21st century world economy with dazzling speed.

And finally, fourth, in a field that has long been dominated by Western-centred research agendas and North-South perspectives, more systematic engagement with South-South comparisons can lead to new data collection efforts and can help to develop reciprocal comparisons without taking Western economic development as the mirror image.

In this regard, the South-South divergence agenda can take the call for reciprocal comparisons to a next level. Western imperialism may play an important role in understanding the roots of South-South divergence, but it does not have to serve as the ultimate benchmark to measure performance.

Is the South a useful category?

I admit that lumping the world together in two blocks may appear old-fashioned. The idea of juxtaposing the North versus the South goes back to 1980, when the *Brandt Report* published the famous map shown in Figure 2.

How useful is 'the South' as an analytical category given its enormous historical diversity in populations, cultures, states, and institutions? I argue that taking the South as a world on its own is defensible, if one allows for hybrid

cases (eg. Japan, Turkey) and is willing to accept the notion of the 'quadruple challenge'. The quadruple challenge refers to the idea that virtually all Southern states had (or have) to, simultaneously, grapple with the questions of:

1. How to catch-up with technology leaders in the West while being at a considerable distance from the frontier.
2. How to overcome the variegated legacies of externally imposed institutions (colonialism) or extended phases of limited state autonomy as a result of imperialist and neo-colonialist pressures.
3. How to mediate the forces of accelerated globalisation, in particular the volatility of world commodity markets and rising capital flows in the context of their distance to global productivity frontiers.
4. How to deal with increasing constraints on cross-border mobility of labour in the context of heightened environmental pressures (the Anthropocene) including climate change.

If these binding elements suffice as a binding core of similarities, then the diversity in local institutions, geographies and colonial trajectories can provide ample material for analysing how these threads intertwine and have led to strongly divergent post-colonial development paths.

Leading questions

There are numerous big questions that can inspire a South-South divergence research agenda. My paper elaborates three of these. First, what explains the limited spread of the developmental state as it emerged in Eastern Asia, and how can other types of political-economic regimes be qualified?

Figure 2. The Brandt line



Source: Brandt et al (1980, p. 31-32) and front cover.

This question has been hitherto been mainly of interest to political scientists. Historians can contribute much to these debates by bringing in deeper time scales, diachronic comparative lenses, and more dynamic conceptions of colonial institutional development.

Second, why is development clustered in space and time? Is it nature (geography, agrarian structures, deep-seated cultures) or should we focus on nurture: how regional processes of integration and disintegration have taken shape in Latin America, sub-Saharan Africa, the Middle East or Southeast Asia?

Third, can the whole world be developed? To what extent do the newly industrialising economies of Asia jeopardise the opportunities of African economies to conquer new niches in world markets? How does the rising pressure and rising prices of scarce raw materials draw mining economies deeper into their paths of natural resource exploitation? These three questions are obviously not exhaustive, but they are all relevant for economic policymaking in the Global South.

In sum, my paper offers a plea to integrate the global South in the historiography of global economic development on its own terms, and to rethink, how new comparative horizons can open up to move the agenda away from the old question how the West got rich or weird (Henrich 2020), and to the new question why modern capacities to enhance human welfare have so far spread so unevenly across the globe. ■

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A framework for geoeconomics

Countries use their economic strength to achieve geopolitical goals. Christopher Clayton, Matteo Maggiori and Jesse Schreger present a novel framework to understand how a hegemon in the international system exerts its power within its economic network

Governments use their countries' economic strength from existing financial and trade relationships to achieve geopolitical and economic goals, a practice often referred to as 'geoeconomics'. Great power competition between the US and China has made geoeconomics part of daily news and an active policy choice in democracies and autocracies alike.

Recent examples include China's Belt and Road Initiative, the US attempting to restrict the use of Huawei's 5G technology in Western countries, and the US using the dollar-based financial system as part of a range of trade and financial sanctions against Russia.

In two landmark contributions, Hirschman (1945, 1958) relates the structure of international trade to international power dynamics and sets up forward and backward linkages in input-output structures as a foundation for structural economic development.

In a new paper (Clayton *et al* 2024), we introduce a framework, inspired by this work, that uses an input-output network model of the world economy to explain how geoeconomic power arises from the ability to consolidate threats across multiple economic relationships (eg. finance and technology jointly) to pressure a target entity.

In our model, a hegemon like the US exerts its power on firms and governments in its economic network by asking them to take costly actions that manipulate the world equilibrium in the hegemon's favour.

Geoeconomic power arises from the ability to jointly exercise threats from separate economic activities, for example, threatening to cut off a deviating entity from both financial services and critical manufacturing inputs.

We characterise the optimal strategy of a hegemon and show that a hegemon asks targeted firms to take costly actions such as imposing or accepting mark-ups on goods or higher rates on lending, but also import restrictions and tariffs.

The network nature of the world economy makes controlling certain strategic sectors more valuable for the hegemon. Strategic sectors increase the hegemon's power over other sectors or its influence over the world economy due to network amplifications.

Collective power over multiple entities gives rise to the hegemon's macro-power – its ability to reshape the world's equilibrium in its favour

We apply our framework to two prominent examples: (1) national security externalities in the setting of US-China competition; and (2) China's Belt and Road Initiative as a sovereign lending programme.

Hegemonic threats to friends and enemies

Hegemons build power by threatening to retaliate against a deviating entity across multiple economic relationships. For example, a target country might be importing both intermediate goods and foreign capital (Figure 1a). If these inputs are controlled separately, there is some value to individual threats.

Generally, however, threats to withdraw both inputs at once (Figure 1b) are more powerful in the sense of inducing greater losses for the target country if exercised.

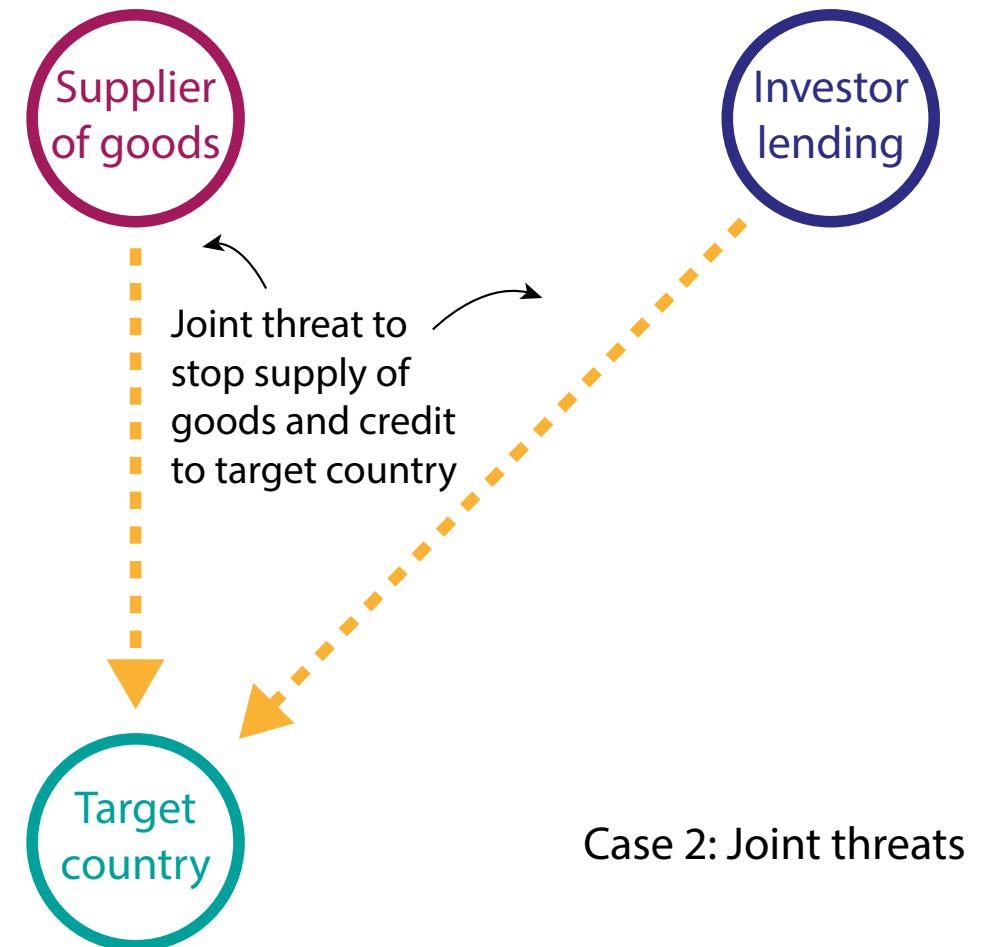
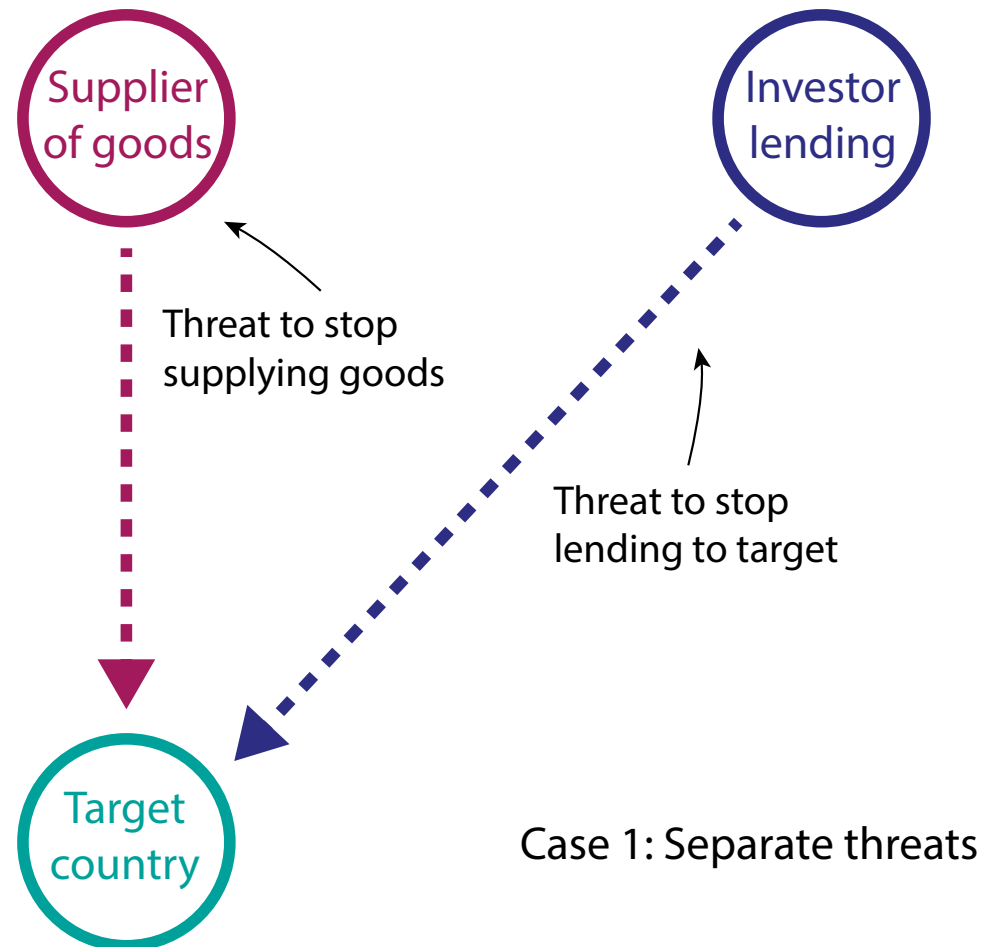
Many threats are either not feasible or not valuable. A threat is not feasible if the hegemon does not control the input. Not valuable means that the target country can easily find a substitute for the input that is withdrawn. For example, Russian threats to withdraw natural gas supplies are less powerful if alternative suppliers can be found.

A hegemon uses these threats to exert power over firms and governments in its network and ask them to take costly actions. These actions can take the form of monetary transfers, mark-ups on trade prices, and surcharges on loans, but also restrictions on import-export (tariffs and caps) and political concessions.

We provide a theory-based notion of friends and enemies of the hegemon (see also Kleinman et al. 2020). Our notion of friendliness is not based solely on nationality or political affinity, but on how an activity impacts the hegemon's welfare either directly or indirectly via its impact on others.

For example, the US might consider a sector producing semiconductor technology in the Netherlands unfriendly in as much as its output is indirectly increasing production of unfriendly technology by China.

Figure 1. Networks and joint threats



Which sectors are strategic?

The designation of an activity as 'strategic in the national interest' is often abused in economic policy. It can mask protectionist or nationalistic aims of government policy. The abuse is possible due to the lack of a clear definition and policy framework against which to assess a candidate policy.

In our framework there are two notions of power: micro-power and macro-power. Sectors are strategic if they increase these powers. A sector is strategic in the micro-power sense if it increases the hegemon's ability to make valuable threats on other entities.

We refer to this as micro-power since it takes as given all aggregate quantities and prices. Strategic sectors tend to supply inputs to other sectors that are widely used and are not easily substitutable. Some sectors have physical properties of this kind, for example rare earths.

Other sectors exhibit these properties because of increasing returns to scale and natural monopolies. An example is the dollar-based payment and settlement system that the US often uses in geoeconomic threats. The dollar system is so ubiquitous that on the margin countries that are excluded have only poor alternatives.

Collective power over multiple entities gives rise to the hegemon's macro-power – its ability to reshape the world's equilibrium in its favour. Some sectors have high indirect influence on world outcomes by affecting prices or quantities produced by other sectors.

These sectors are strategic because control over these sectors allows a hegemon to influence indirectly a large part of the world economy that it does not directly control. Research and technology, especially at the cutting edge or for military use, are sectors of this kind.

Understanding the US restrictions on Huawei

We consider the US hegemon demanding that countries in Europe stop using a technology input from China that is a national security concern for the US.

As illustrated in Figure 2, the hegemon US can pressure firms and governments in third party countries to curb their imports of Chinese company Huawei's 5G telecommunication infrastructure even though there are benefits to these users from using such technology.

This application highlights the power of endogenous amplification through the production network. We assume that this technology has a strategic complementarity: each user finds the technology more productive the more other users are also using the same technology. These complementarities are typical of information technology but are also present in financial technologies like payment systems.

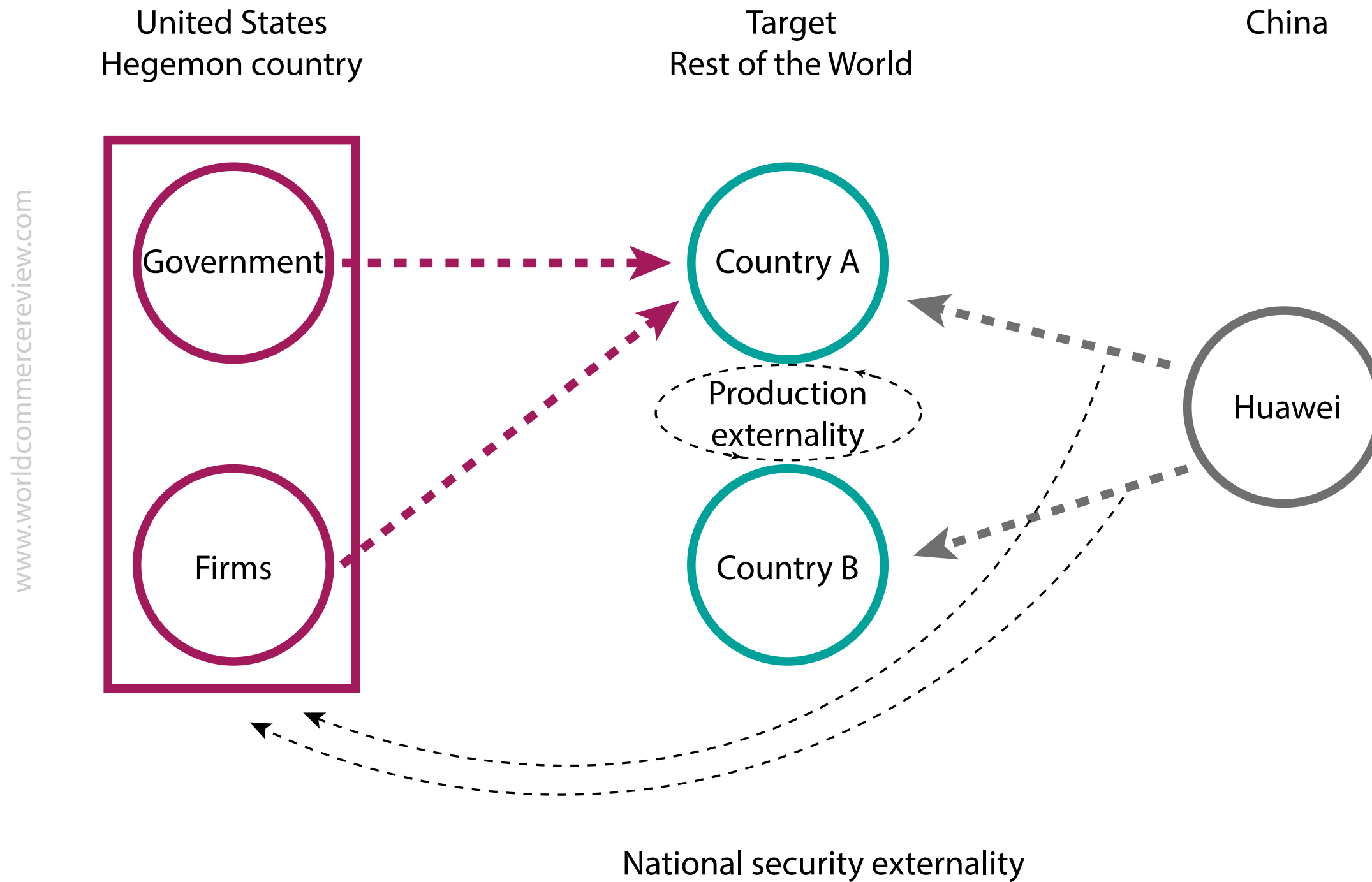
The US wields its macro-power by demanding entities in its network to curb the use of this technology. As targeted sectors use less of China's technology, the technology becomes less attractive also to other sectors that the US cannot directly pressure, increasing the overall impact of US demands.

Understanding the Belt and Road Initiative

China's flagship Belt and Road Initiative provides countries involved package deals of lending, infrastructure projects, and manufacturing inputs. China often extracts political concessions and or better access for its firms to new markets.

We model how China can combine lending and manufacturing exports to extract political concessions (Figure 3). We consider a target country with low legal enforcement, eg. an emerging or frontier market. In the absence of China's geoeconomic power, the country has limited willingness to repay the debt.

Figure 2. US national security and 5G infrastructure from China

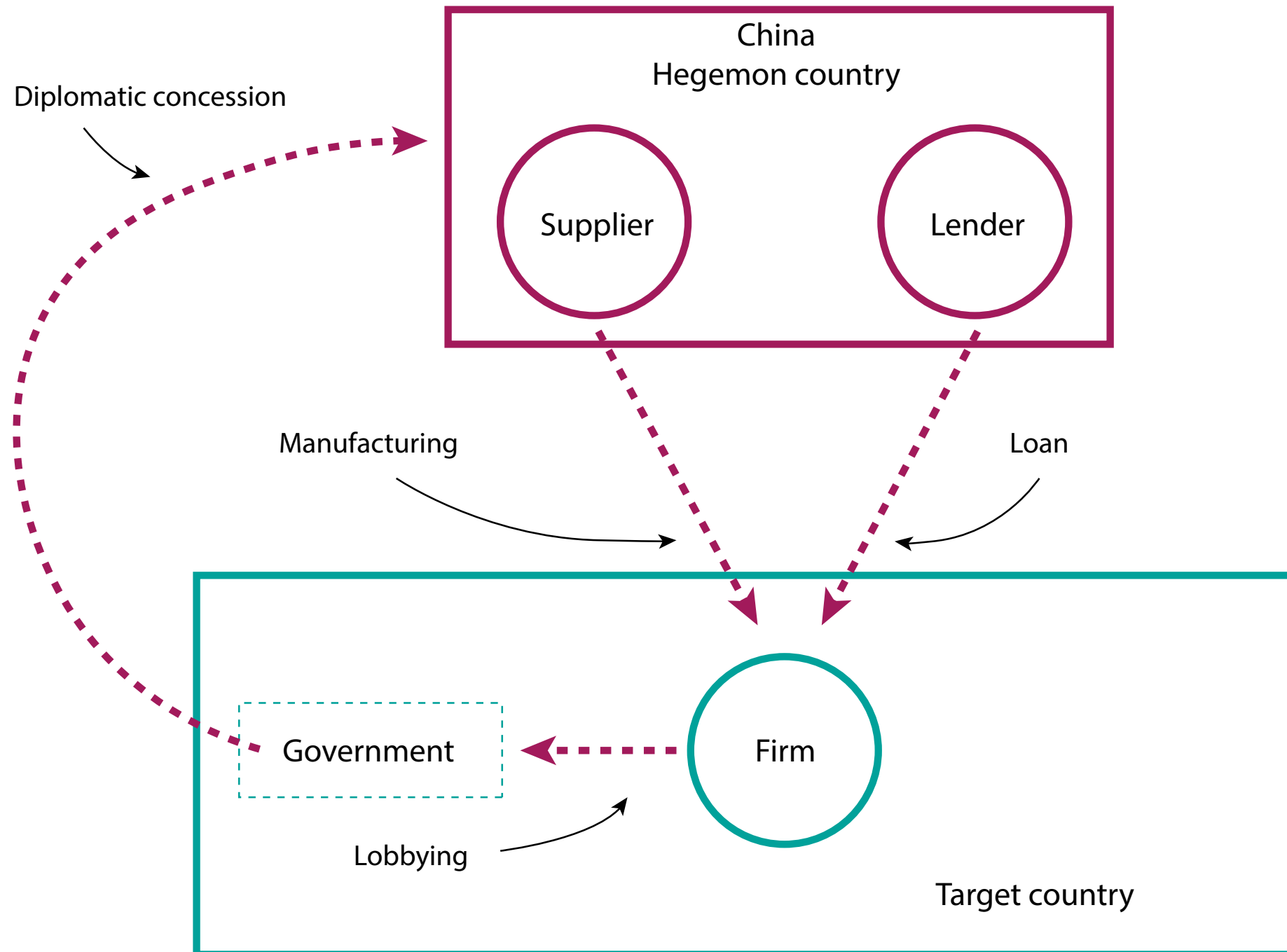


However, China can threaten to jointly stop the financing and reduce the supply of manufacturing goods if the target country does not repay the debt or attempts to expropriate the goods. This joint threat is very powerful, and it expands economic activity that can be carried out in the targeted country.

China extracts some of the value created in these economic relationships in the form of political concessions, for example, closer alignment over the recognition of Taiwan. ■

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Figure 3. China's Belt and Road Initiative



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The pervasive influence of political composition on circuit court decisions



Each year, the US Circuit Courts of Appeals consider thousands of appeals on the rulings of federal district courts. Alma Cohen examines whether the identity of the politicians that appoint judges to these courts can help predict outcomes in these cases

It is widely believed that the identity of the US presidents appointing justices to the country's Supreme Court can help to predict the justices' decisions in the small number of ideologically salient issues the court considers each year. But what about the country's federal Circuit Courts of Appeals?

These courts, which are one level below the Supreme Court, consider all appeals on the rulings of federal district courts; each year they decide many thousands of cases that mostly do not seem to involve ideologically controversial cases.

When, and to what extent, do the decisions of circuit court judges that are appointed by Democratic presidents (henceforth, 'Democratic judges') and Republican presidents ('Republican judges') systematically differ? This question has been the subject of a long-standing and heated debate.

The 'traditional' view is probably best represented by a series of articles written long ago by two former chief judges of the Circuit Court of Washington, DC (eg. Edwards 1985, Wald 1994). These judges conceded that political affiliations are often associated with judicial decisions at the Supreme Court, but they maintained that this was largely *not* the case at the circuit courts. In their view, the political affiliations of circuit court judges are irrelevant to the outcomes of most circuit court cases.

By contrast, a 'legal realist' view on the subject has been developed, based partly on empirical research, by a number of prominent legal and political science scholars. Classic studies documented the existence of 'party effects' in a set of cases involving free speech, civil rights, labour relations, and criminal appeals (Songer and Davis 1990); in a set of cases reviewing decisions by the Environmental Protection Agency (Revesz 1997); and in sets of cases on 'ideologically controversial' issues, such as abortion, affirmative action, capital punishment, and sex discrimination (Sunstein *et al* 2004).

Subsequent work confirmed this pattern of party effects in various categories of cases that are ideologically controversial or salient.

Although these scholars argued that there is evidence that the political composition of circuit court panels can predict outcomes in some specific sets of cases, they mostly left unanswered the question of how broad and widespread the influence of political composition is.

Whether a Democrat or a Republican is elected to the presidency can have a broad and long-lasting effect on the subsequent evolution of federal law doctrines and on the resolution of a massive number of individual cases

For example, Sunstein *et al* (2004) stressed that their findings were “*limited to domains where ideology would be expected to play a larger role*”, and that “*outside of such domains, Republican and Democratic appointees are far less likely to differ.*”

These authors remained agnostic on whether party effects might be present in “*apparently non-ideological cases involving, for example, bankruptcy, torts, and civil procedure*”, and they viewed answering this question as an important challenge for future work.

In a recent study (Alma 2023), I seek to meet this challenge. My ability to do so is facilitated by a novel dataset I have compiled, which is much larger and more comprehensive than the datasets used by earlier works on the subject. Prior empirical works have largely focused on limited sets of cases that involved ideologically salient issues and that had a published opinion.

By contrast, my dataset includes about 670,000 cases from the period 1985-2020. This dataset encompasses all the varied types of cases that are considered by the circuit courts, including cases that are not ideologically salient and cases without a published opinion.

Using this dataset, I investigate whether significant party effects are present in the vast universe of circuit court cases. There are several reasons to expect Democratic and Republican judges to systematically differ in such cases.

Among other things, cases that are not ideologically salient might still involve some ideological dimensions; Democratic and Republican judges could systematically differ in their attitude toward various types of parties and circumstances; and Democratic and Republican judges might differ in their approach to the judicial process,

including in their views about the appropriate level of deference due to lower-court decisions. Democratic and Republican judges might even systematically differ in their personality traits and characteristics.

I find that the evidence supports the hypothesis that the political affiliations of panel judges can help to predict outcomes in a broad set of cases that together represent over 90% of circuit court decisions. The association between political affiliation and outcomes is thus far more pervasive than has been recognised by prior research.

To the best of my knowledge, my paper is the first to identify and characterise such a pervasive role of party effects throughout the large universe of circuit court cases.

A substantial part of my analysis focuses on how political affiliation can help to predict outcomes in six categories of cases in which one of the parties has characteristics that could lead judges to perceive it as being in a weaker position than the other party. These six categories add up to about half a million cases.

I hypothesise that Democratic judges and Republican judges systematically differ in their tendency to side with the seemingly weaker party, and I find evidence supporting this hypothesis in each of the identified six categories of cases.

One noteworthy category of cases involves civil litigation between individuals and institutions. In many such cases, though by no means all, the individual party could be perceived by judges to be the weaker party. My analysis shows that panels with more Democratic judges are more likely than Republican judges to reach a decision that favours the individual party.

Other noteworthy categories of cases involving parties of seemingly unequal power involve cases in which individuals that appear to be in a weak or vulnerable situation – such as criminal defendants, prisoners, and immigrants – litigate against governmental entities or officials. I find that, in the categories of criminal appeals, immigration appeals, and prisoner litigation, increasing the number of Democrats on a circuit court panel raises the odds of an outcome favouring the weak party.

The association between Democratic judges and ‘pro-weak’ outcomes that I identify is not only highly statistically significant but also meaningful in magnitude. To illustrate, for the six case categories as a whole, switching from an all-Republican panel to an all-Democratic panel is associated with an increase of 55% in the baseline odds of a pro-weak outcome.

Thus, the odds of a Pro-weak outcome would very much depend on ‘the luck of the draw’ – that is, the political composition produced by the random assignment of judges to the panel.

Furthermore, after partitioning the universe of cases in a number of natural ways, I find that the above results are not driven by, or limited to, certain subsets of cases. The identified association is present in both cases that are ideologically salient and those that are not; in both cases with and without published opinions; and in both cases with and without an oral hearing.

These patterns are present in all different circuits and during the tenure of each of the presidents serving in the examined period. Indeed, my investigation of different subsets does not identify any significant subset of cases in which having more Democratic judges on the panel does not increase the odds of a pro-weak outcome.

Going beyond the six categories of cases in which judges could view one of the parties as weaker, I also identify an association between political affiliations and outcomes in cases between parties that seem to be of equal power.

In particular, I find such an association in civil litigation between two institutional private parties and civil cases between two individuals. For such cases, I hypothesise that having more Democratic judges on the panel increases the odds of the panel intervening in, rather than deferring to, the district court decision.

This 'less deference' hypothesis is due to the possibility that Democratic and Republican judges might attach different weights to the costs and benefits of reducing deference to lower-court decisions. Relative to Republican judges, Democratic judges might attach greater weight to the 'costs' of leaving in place 'mistakes' in individual lower-court decisions, or they might attach lower weight to the resource-saving efficiency gains from deference to district court decisions, or both.

Testing the 'less deference' hypothesis, I find that the outcomes of civil litigation cases between parties that appear to be of equal power are consistent with this hypothesis.

In addition to demonstrating the pervasive role of panels' political composition, my analysis also sheds new light on inter-panel dynamics. I show that a lone Republican judge on a panel with two Democratic judges has a stronger 'moderating' effect on the panel majority than does a lone Democrat on a panel with two Republican judges. I also discuss the possible reasons for, and implications of, this asymmetry between Democratic and Republican judges.

I would like to stress that, although I find systematic differences between the decisions of Democratic and Republican judges, my analysis does not take a normative view on whether one of the approaches is in some way better.

For example, while I find that Democratic judges are more likely to side with the weaker party in litigation, the data do not tell us, and I take no view on, whether Democratic judges are too protective of such parties, Republican

judges are insufficiently protective, or both. My contribution is merely to show how the two types of judges systematically differ in their decisions.

It is also worth stressing that my results do not imply that political affiliations fully determine outcomes or enable a prediction of panel outcomes with certainty. Circuit court decisions are undoubtedly likely to be influenced substantially by legal dimensions (such as relevant legal rules and precedents) and by the factual conclusions reached by the lower court.

Therefore, these decisions mostly cannot be predicted with certainty in advance. Political affiliations are shown by my analysis not to *determine* outcomes, but merely to *influence* them. Thus, whereas knowing a panel's political composition does not enable us to predict with certainty the panel's decisions, knowing this composition can significantly help to assess the odds of particular outcomes.

Overall, my findings highlight the importance of the power of the United States president to appoint circuit court judges (subject to confirmation by the Senate). Each president appoints many circuit court judges, and they often continue to serve for many years after the president departs. Thus, any presidential election should be expected to have a large and enduring effect on the political composition of circuit court panels.

Given my findings regarding the breadth and significance of the association between political composition and case outcomes, it is necessary to recognise that the result of any presidential election is likely to have broad and significant effects on circuit court decisions for many years to come.

To illustrate this point, consider the 2000 election between George W Bush and Al Gore. After winning an extremely close election in 2000, Bush went on to win a second term in 2004. During his two terms in office, Bush appointed a

total of 62 circuit court judges and, as of the end of 2020, 33 of them still served as active circuit court judges and 16 of them served as senior judges with a reduced load.

Searching through my dataset, I find that about half of the cases decided during the period 2001-2020 had a 'Bush-affected panel' – that is, a panel that included one or more judges appointed by President George W Bush.

Let us consider a hypothetical scenario in which Gore, instead of Bush, won the 2000 election and subsequently the 2004 election. Let us also assume that, in this scenario, Gore would have filled all the circuit court vacancies filled by Bush (and only those vacancies).

In this hypothetical scenario, in all of the Bush-affected panels, the number of Democratic judges would have increased (and the number of Republican judges correspondingly declined) by one or more. Using the results of the regressions in my study, I estimated how a switch to the above Gore scenario would have affected circuit court decisions during the 20-year period 2001 to 2020.

Based on this exercise, I estimated that a Gore presidency would have changed the outcome of about 10,000 different cases during the period of the 20 years following the 2000 election. These changes would have included: (1) about 2,500 improved outcomes for individuals in civil litigation against institutional parties; (2) about 1,100 improved outcomes for private parties in their civil litigation against the government; (3) about 2,500 improved outcomes for criminal defendants in criminal appeals; (4) about 1,500 improved outcomes for immigrants in immigrations appeals; (5) about 1,100 improved outcomes for prisoners in prisoner litigation; and (6) about 1,200 additional reversals of lower-court decisions.

Furthermore, my dataset indicates that about 19% of the cases decided by Bush-affected panels produced an opinion that was considered to have precedential value and was therefore published. Therefore, the above estimated changes in case outcomes would likely have moved the body of circuit court precedent in directions favourable to relatively weak litigants in a broad range of legal areas.

The effects of presidential elections on the Supreme Court have long received much attention from the candidate campaigns, voters, and the media. For example, during the 2020 presidential campaign, President Trump sought to get credit from voters for nominating three conservative judges to the Supreme Court, and President Biden strongly criticised these nominations.

The above discussion indicates that much attention should also be given to the effects of each presidential election on subsequent circuit court decisions. Whether a Democrat or a Republican is elected to the presidency can have a broad and long-lasting effect on the subsequent evolution of federal law doctrines and on the resolution of a massive number of individual cases. ■

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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

On 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)¹.

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).

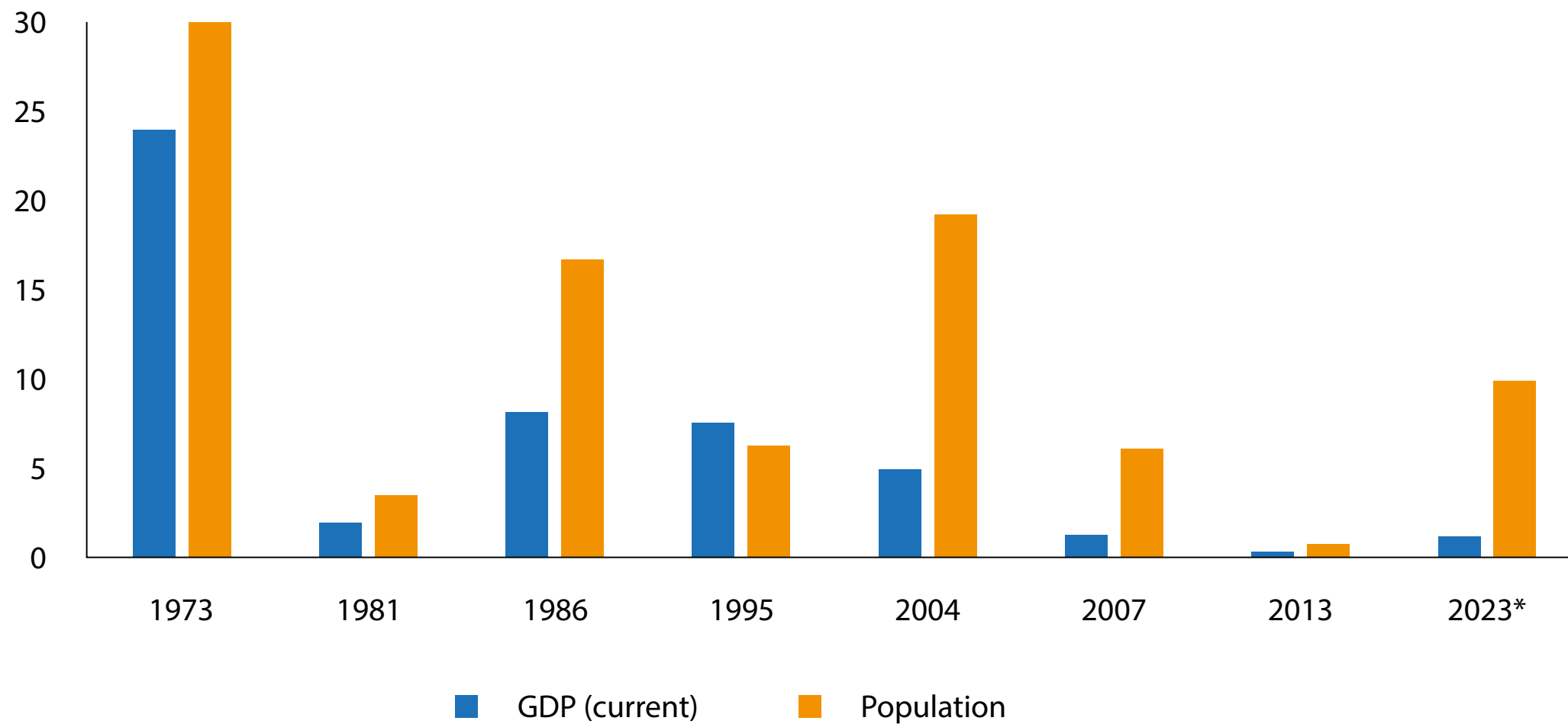
As one can see in Figure 1, the largest enlargement both as a share of the EU's GDP and population was actually the first one in 1973, which reflects the small number of initial EU member states and the large relative importance of the UK: the EU's population increased by almost quarter, and its GDP 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 states².

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 capita³ 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*⁴, 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 payers⁵; 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 year⁶ (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 reforms⁷.

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 does 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 heterogeneous 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](#).

Antitrust and the political economy: Part 1

A person with grey hair is shown from the chest up, wearing a dark jacket. They have their hands pressed against their face, covering their eyes and forehead, which conveys a sense of stress, despair, or being overwhelmed. The background is a plain, light-colored wall.

The last five years has seen policymakers struggle to deal with overlapping emergencies. Cristina Caffarra discusses the changing role of antitrust

The last five years of 'polycrisis' have accelerated a rethink in received wisdoms across multiple areas of policy, with several paradigm shifts in 2023 as policymakers struggled to deal with overlapping emergencies. Re-appraising the role that government can play in directing and making large transformational investments, founded around a 'new industrial policy'; rethinking the causes and cures for inflation; recognising that trade policy which enabled hyper-globalisation and facilitated offshoring also favoured large incumbents; embracing antimonopoly as an explicit goal.

As a key instrument to control how assets get reallocated and used in the economy, antitrust cannot be aloof and independent of the profound shifts affecting the economy and upending other policy choices. Current US enforcers have embraced this holistic view, elsewhere is more of a struggle.

This first column in a two-part series argues that the defensive posture of much of the antitrust community at large is a-historic and out of touch.

The confluence and intensification of multiple crises (climate, energy, pandemic, wars) in the post-2008 era, accelerating since 2019, has driven major reappraisals in multiple policy areas and changed conventional wisdoms – leading to what Rana Foroohar recently described as the 'Great Reordering' orchestrated in the US by the Biden administration, an 'epochal shift in how the economy is governed' (Foroohar 2023).

'Resilience' and 'strategic autonomy' have become fundamental economic goals given realisation that long supply chains are unreliable and brittle, making us dependent on unfriendly regimes for everything from energy to commodities to sophisticated components; deindustrialisation has occurred with little relief from social amortisation measures; the labour share of GDP has fallen and large swathes of the population have become impoverished and disenfranchised.

Inequality between vast corporations with enormous lobbying powers and citizens has deeply affected the democratic discourse in the US and elsewhere.

Europe has multiple issues of its own – including divisions and fragmentation – but is also reflecting on similar phenomena; see the *Resilient EU 2030* report produced by the Spanish Presidency of the EU in September 2023, which provides a realistic appraisal of the mountain Europe has to climb and why it needs an urgent plan (Spain's National Office of Foresight and Strategy 2023).

Antitrust is the policy tool we have to police the reorganisation and recombination of assets in the economy, especially by firms with market power, and the way they are deployed vis-à-vis competitors and consumers

Paradigm shifts in industrial policy, inflation control, and trade

A major rethink is leading to the resurgence of industrial policy as a key lever to direct and implement change. While the very notion of industrial policy was unmentionable in the US until five years ago, and in Europe was traditionally associated with bad, inefficient national champions lobbying their governments for subsidies, the position has moved on.

State-led programmes like the US Inflation Reduction Act, the American Rescue Plan, and the Investing in America agenda (and European equivalents) were initially seen with apprehension as the first salvo of a protectionist turn and a bad 'race to subsidies'.

There is, however, recent serious work on industrial policy by economists and economic historians¹ debunking the myth that state intervention needs necessarily be about 'picking winners and supporting losers'.

State participation and investment can drive essential progress in areas where private initiative is insufficient – greening the economy, expanding energy sources, creating and updating infrastructure, designing intellectual property, laying out independent digital systems.

This is much more ambitious than the traditional narrow framing of 'legitimate' industrial policy (one that meets 'state aid controls' in European parlance) as a mere correction of 'market failures' that needs to pursue 'efficiency' at all costs. 'Efficiency' – a word which features hundreds of times in a recent paper by DG Comp economists on industrial policy and state aid control (Piechucka *et al* 2023) – is a bad single fixation in policymaking.

While we do not want to be wasteful, the notion that we can only pursue public investment if we prove it to be 'efficient' is a major drag on designing more ambitious initiatives. Yes, intervention needs to be purposed in well-

defined ways, not as 'moonshots' (unhelpful framing); indeed, a recent paper by Mazzucato and Rodrik (2023) seeks to move beyond 'moonshots' and set out a taxonomy based on actual case studies, with emphasis on 'conditionalities'.

This rehabilitation of industrial policy is A Big Deal: we will not get out of our predicament relying on markets alone – especially in Europe, which is suffering from structural issues that drive major gaps in productivity and investment (see multiple reports commissioned recently by the EU to *hommes savants* Mario Draghi and Enrico Letta)².

Another distinct area where recent events have triggered a major rethink has been the inflation spike of 2022-23. In the US, multiple experts predicted at the time that this would require the Fed to sharply raise interest rates to create lasting mass unemployment, which would eventually beat inflation by curbing demand, albeit at the cost of a painful recession.

A few 'heterodox' economists (Claudia Sahm, Stephanie Kelton, Isabella Weber and others) argued instead that inflation was a transitory phenomenon caused by supply-side disruptions (pandemic, war) which meant supply chains were kinked and brittle, but would subside without a necessary recession once supply constraints were worked through.

While the Fed did indeed raise interest rates, the anomaly is that unemployment did not increase and the economy grew, achieving what appears to be a 'soft landing' and (at least so far) averting a recession.

Paul Krugman and Olivier Blanchard³ have been calling the quiet part out loud: that the 'orthodoxy' got the analysis mostly wrong, and while there is still uncertainty as to the precise mechanism that led prices back down, the traditional framing of the causes and cures to inflation is clearly being challenged.

European inflation had its own dynamic (eg. war and related gas price shocks, on top of the pandemic supply chain brittleness), and induced responses that were also controversial and unorthodox (the 'gas price break' in Germany from 2022, energy price controls also in France).

Yet another space where established thinking is challenged by changes in the political economy is trade. The conventional wisdom of adherence to WTO rules designed to eliminate barriers to trade has come under major question.

While 'hyper-globalisation' freed up inputs that were inherently mobile (capital and goods), labour remained essentially moored into place while social amortisation initiatives were inadequate. Industrial capacity was offshored, significant pockets of the labour force were impoverished and disenfranchised.

Further, free trade agreements that lowered barriers to trade had been often designed to favour the interests of major corporations – rules on pharma dictated by Big Pharma, rules on data flows and data localisation by Big Tech – and governments sided with these interests.

The approach is now questioned for instance as US Trade has challenged the standard argument that domestic giants should be favoured to withstand China and argued that dealing with foreign rogue monopolies does not justify abiding by monopolies at home – chokepoints need to be broken up, and domestic monopolies should not be tolerated on grounds they are somehow needed to counter bad foreign ones.

US support to WTO data flow and data localisation rules has been recently paused ('to create space for Congress and policymakers to decide on these issues') (Office of the USTR 2023, Kilic 2023). This position is also closer to that

of the Global South, which is putting forward its own claims to a more equitable, post-colonial trade regime also in tech.

What about antitrust?

With all this happening around us, can antitrust be an island of stillness? Because 'we know' (classic antitrust economist answer) 'we just know how firms and markets work'? How do we know? And all of this has stood still for the last 20 years? When a major driver of market dysfunctions and resulting inequality has been the rolling concentration of industry after industry (from chemicals to pharma to tech) also as a result of weak enforcement?

After years of permafrost and inaction, the dam finally broke and in the US we have seen a revolution in antitrust posture over the last two years. This has been incredible to watch for Europeans used to thinking 'we are the lead enforcers'.

It has also met with much resistance, with the neo-Brandeisian movement tainted as fixated on 'bigness' and bent on fighting large corporations because of nostalgia for an era of inefficient small traders, as well as anti-business and anti-Wall Street sentiment (see multiple editorials in the *Wall Street Journal*, network commentary, etc).

But this is a caricature which ignores how we got here. The current enforcement posture is not isolated ideology by 'political' heads of agency. Antitrust is the policy tool we have to police the reorganisation and recombination of assets in the economy, especially by firms with market power, and the way they are deployed vis-à-vis competitors and consumers.

The paradigm shift that Lina Kahn and Jonathan Kanter (and their colleagues) have sought to bring about in the US can be seen as a 'return to the original animating values' of US antitrust, but should also be read in the context

of massive changes in the underlying political economy which have also spawned other policy rethinks: the end of 'trickle-down economics', after half a century of devoted practice.

It would be unusual and bizarre if underlying economy-wide shifts of this magnitude left antitrust enforcement unchanged – in the face of evidence of increased concentration in multiple sectors resulting from serial deals 'rolling up markets' over the past two decades, inequality increasing, unfairness in commercial practices, exploitative and exclusionary conduct, issues in labour markets, as well as violations of privacy on a massive scale.

How can we fail to adjust enforcement to this changed landscape? For a further discussion and proposals, see the second column in this series. ■

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Endnotes

1. Just to quote a few, Lane (2020, 2021), Juhasz et al (2023); see also Criscuolo et al (2022).
2. See <https://www.ft.com/content/e4681f0f-52ec-4f78-bbc8-fd7381ebfeb3> and https://institutdelors.eu/wp-content/uploads/2020/11/20230915_Report-Letta-ENG.pdf.
3. See Krugman (2023) and various tweets by Olivier Blanchard.

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Re-joining trade with antitrust

Cristina Caffarra and Burcu Kilic describe how antitrust thinking has been undergoing a major shift in the US, and 'antimonopoly' has become a broader value in multiple areas of economic policy

The challenge to the neoliberal paradigm that has upended antitrust thinking in the US over the past five years has started to affect US trade policy. The two have operated quite separately over the last few decades in the US, although they shared a neoliberal paradigm that privileged a focus on efficiency and lower costs/prices.

The common connecting tissue was a view that if we eliminate barriers to the movement of capital and goods, production will migrate to places with competitive advantage (lower cost) and consumers at home will benefit from imports of cheap goods; markets will be open and contestable and as long as entry is possible, concentration will deliver efficiencies and lower prices, which again benefit consumers.

We know how the story really unfolded, the telling amplified by the pandemic, war, energy crisis, and ensuing inflation. Capital and goods can move fast, people don't – so globalisation often meant impoverishing communities at home which did not end up benefiting from 'trickle-down' growth theory (Rodrik 2011).

Antitrust was captured by a pro-corporate efficiency paradigm which assisted concentration across the economy and forgave all sort of conduct that squelched, maimed, or simply bought up any challengers.

The major shift that has taken place over the last few years is that antitrust has been substantially redirected, at least in the US, from caring for 'consumers' (a narrative now almost synonymous with corporate interest) to a focus on 'citizens' (workers, farmers, small businesses, communities), with an explicit 'antimonopoly' agenda.

And this fundamental shift in antitrust posture and focus is also leading to 'trade orthodoxy' being challenged from within. US Trade Representative Katherine Tai has been calling out the *"idolization of efficiency in trade"* and started to join the dots with a [notable speech](#) in June 2023.

At a recent major [antitrust conference](#) in Brussels, she [went further](#): “the change vectors we are grappling with in trade are the same you are grappling with in antitrust. The free trade paradigm of the last few decades was built on a fixation for maximizing efficiency, and liberalization of trade became an end in itself, perpetuating a race to the bottom: cutting costs, exploiting people and planet. Just as antitrust has been detaching from the consumer welfare standard, we need to think about the humans in the economy as not just consumers. They are also workers. We cannot pursue policies to benefit people as consumers if those are impoverishing people as workers.”

It seems important to recognise that in an increasingly fractured world, with concern about trade barriers on the rise, free trade has not always been in the interest of people but often a tool to extend corporate power and shape markets globally in ways that benefit dominant corporations and are not democratic or pro-citizen

Further, *“the injection of public interest is also a big theme in trade, we are breaking out of the proxy that what is good for the biggest corporate stakeholders in our system equals what is good for America and Americans as a whole – we’ve seen over time that just isn’t happening.”*

This is a major change of direction at US Trade, reflecting a recognition that the antimonopoly battle at home should not be contradicted or undermined by trade rules that for too long have been [designed by the same leading US corporations](#), and shaped to benefit them.

But also a recognition that in a connected world where every country should be an equal at the table, trade rules that are made by Global North corporations to benefit owners of capital and data are harmful to global efforts to protect fundamental rights, reduce inequality, and democratise economic opportunities.

That this is a hugely controversial position that antagonises large US giants and their lobby has become apparent from press attacks on Tai’s USTR, [accused of being influenced](#) by progressive advocacy groups and of betraying America’s corporate interests.

The most sensitive area at the moment is data and digital trade, where prodding the interests of Big Tech (Kilic 2021) caused a major backlash. Before expanding on that, we set out a few more general considerations on why universal antimonopoly values should also have a foundational role in trade policy.

Antimonopoly values in trade

The post-neoliberal rethink of antitrust in the current US administration (the ‘neo-Brandeisian’ vision), with a focus on targeting corporate power per se, has been a major transformation in US economic policy, extending to multiple areas (the ‘all of government’ approach) and reverberating across the world.

After two decades under the permafrost, US antitrust regulators in the current administration are sending an aggressive message about the democratisation of antitrust: not a technocratic pursuit by a selected church of lawyers and economists advancing the interest of corporate power, but a broad effort to pursue the interest of citizens (not just consumers, but workers, small businesses, farmers).

The 'Washington consensus' for dealing with developing countries (essentially prescriptions dating back to the late 1980s for opening them to the global marketplace) has also been engulfed in the post-neoliberal bonfire. The WTO, the multilateral body that is supposed to achieve consensus on trade rules and is (in theory at least) the traditional home of free trade, is **currently in turmoil** with deep divisions and major ideological disagreements between free trade faithful, those contemplating the failures of the free trade paradigm, and everything in between including deep lobbying by corporate interests.

At a minimum, it seems important to recognise that in an increasingly fractured world, with concern about trade barriers on the rise, free trade has not always been in the interest of people but often a tool to extend corporate power and shape markets globally in ways that benefit dominant corporations and are not democratic or pro-citizen (Stiglitz 2006, 2008). The relationship between trade and competition requires much deeper reflection and understanding.

The Global South in particular has been on the receiving end of free trade rules shaped by the Global North which have sculpted their domestic markets. Given the wide disparities in growth and development levels, negotiations on trade agreements have tended to take place on an uneven footing, with 'linkage bargaining' (Ryan 1998) around unrelated issues at times aimed to get these countries to agree to rules that benefited multinational companies – for instance, stricter intellectual property protections in the WTO's Agreement on Trade-Related Aspects of Intellectual Property (TRIPS) and other US trade agreements¹.

Eliminating trade barriers has also meant that powerful corporate interests could establish themselves, create first-mover advantages in developing countries, suffocate local competition, oppose domestic regulations, create persistent concentration, and leave local regulators to deal with a mess of abuse and strong-arm tactics, supported by armies of lawyers.

This has been the case across multiple sectors from agriculture to chemicals to pharmaceuticals to e-commerce and digital markets. Pursuing the free trade interest of corporate giants is not without consequences on people and the planet, both abroad and at home, and at odds with explicit antimonopoly policies at home.

This is the sense in which trade should not be philosophically and practically siloed from antitrust thinking. In a world where efficiency has been dethroned as the dominant value in antitrust, we should also be clear about what trade policies that appear to pursue free trade in the name of efficient outcomes can do.

An instructive example is digital trade, [the focus of much recent agitation by Big Tech](#), since USTR withdrew its support for some controversial digital trade rules advanced by the previous administration at the WTO's Joint Statement Initiative talks in October 2023. USTR argued that the US needed to re-evaluate its position on these rules in light of rapid changes in technology – for example, artificial intelligence capabilities (Kilic 2024).

The outcry of Big Tech around the issue has been reflected in much [adverse press coverage and accusations](#) that USTR is captured by progressive thinking. In practice, African countries have meantime agreed to those same rules USTR withdrew amongst themselves in the African Continental Free Trade Agreement (AfCFTA) Digital Protocol (Gathii 2024), reflecting the ability of these corporations to 'divide and rule', [pressing their preferred outcomes in multiple venues](#).

This is instructive of how dominant US companies continue to use their lobbying influence to extend their power abroad, and why we need to join the dots much better. If antimonopoly is an overarching value (and it should be), then it needs to be threaded consistently across areas of policy. We expand further on the digital trade battle below.

Why is digital trade a focal point for an antimonopoly vision?

For Big Tech companies which aim to operate on a global scale, the world is the stage and **expanding reach and influence** across countries a key objective. While the US is still the largest and most profitable market, establishing the surveillance business model across continents and countries with rapid demographic growth is essential to entrenching their position into the future.

This is why free flows of data across borders and rules on server locations are so important: if data flows were restricted, the ability to operate with no constraint would be reduced and the opportunity to exploit the world's data for profit would be contained. Except voices from around the world are increasingly asserting their presence and demanding a re-evaluation of trade norms around this issue.

Since 1998, the WTO has **implemented a 'temporary' moratorium** on customs duties on digital transmissions. The moratorium has made it easier for data, entertainment, and digital goods to cross borders without taxes. Back when this rule was set, trade in data was a novel idea and the focus was on favouring the development of e-commerce.

But now digital trade has grown to include not just digitally enabled services but also the trading of data and digital assets like personal information, data sets, algorithms, and models. This raises issues from protecting privacy and safeguarding democracy to addressing surveillance capitalism and fostering digital development.

These issues are also very salient in the Global South – for instance, a trade policy with a zero tariff (a moratorium) on digital flows is what allows tech companies to avoid establishing operations in a country and export the data,

telling regulators they do not have jurisdiction when challenged. It is what allows them to locate all their profits in places like Ireland or Bermuda where they pay low or no tax, with serious consequences for social and economic justice.

Developing economies have become increasingly vocal about the need to have a plan for reflecting their economic interests in a meaningful outcome, rather than a rote extension of the moratorium. The WTO Ministerial Conference in Abu Dhabi just extended it for one last time until 2026 at the eleventh hour, but the issue is firmly on the table.

Meantime in the US, [USTR is now participating in President Biden's Competition Council](#) as part of a coordinated effort to improve resilience and tackle excess market concentration, and the connection has been formally made that trade agreements have a role in the global digital governance landscape.

Recognising the inadequacies of trade governance to tackle the complexities introduced by digital technologies and AI, USTR also revised its positions on data flows, server locations, trade secret protections for source code and algorithms and non-discrimination at JSI talks in 2023 (Kilic 2023).

It cited the need to create 'policy space' for the US Congress and the administration to craft proposed rules more consistent with the effort against tech monopolies at home. The administration also issued an Executive Order prohibiting data transfers to China and 'countries of concern' on security grounds.

Where is Europe in all of this? There is inevitably suspicion of the US late 'conversion'. European officials have long grappled with the tension between trade agreements and digital governance, a challenge they understand is intensified by surveillance capitalism. Surveillance capitalism has long presented a major problem for European trade negotiators trying to uphold the EU's strong data protection standards in European trade agreements.

In 2018, the EU adopted horizontal provisions on crossborder data flows, data protection, and privacy for its bilateral and multilateral trade agreements, affirming a strong commitment to EU data protection rules and fundamental rights (Yakovleva and Irion 2020). Yet these provisions have not received the support they deserve.

Although established as a non-negotiable redline, the EU first retreated in its agreement with the UK (Scholte 2021) and more recently with Japan, raising questions about the resilience of EU policy space (European Data Protection Supervisor 2024).

It would be undesirable for the EU to step back just as the US appears to be moving closer; especially as the US appears to be doing so not in the pursuit of the usual US corporate interests but of a more deserving vision that could benefit citizens in the Global North and South alike.

Seriously joined-up thinking that pulled together the fight against digital extractive business models, sovereignty for data and infrastructure, and trade posture should be an achievable goal for the new European Commission mandate.

More broadly, trade is not an island and antitrust is not an island. Trade rules shape markets and understanding the antitrust implications needs to be part of a discussion where the Global South (whose interests are in fact aligned with that of citizens in the North) has a major role to play. ■

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Endnote

1. All US FTAs signed in the past 20 years have required trading partners to enact intellectual property (IP) laws that are stronger than those required by TRIPS (Palmedo 2021).

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Antitrust and the political economy: Part 2

A person with grey hair is shown from the chest up, wearing a dark jacket. They have their hands pressed against their face, covering their eyes and nose, with their fingers spread. The background is a plain, light-colored wall. The overall mood is one of despair or frustration.

Cristina Caffarra argues it would be bizarre and unusual for antitrust enforcement to regard itself as an island of stillness, and calls for a more open approach

The first in a series of two columns argued that in the face of major paradigm shifts in other key areas of economic policy in the wake of the 'polycrisis', it would seem bizarre and unusual for antitrust enforcement to regard itself as an island of stillness.

Yet there is enormous resistance throughout the antitrust community to recognising that antitrust can have a major role to play as part of an effort to deal with existential issues of our times: concentration begetting economic power and political influence, inequality, the North-South divide. This second column considers ideas for a more open approach to antitrust enforcement.

Epochal shifts in the economy, accelerating over the last five years of 'polycrisis', have also profoundly affected the structure of markets and the relationship between consumers, workers and producers, as well as the bargaining power and distribution of rents between them.

There is a deep and urgent question about how antitrust enforcement can carry on 'as usual' in the face of these events. For instance, if we broadly agree (and many do) we have been too lenient for two decades and let too many meritless deals through, doesn't this justify a more lenient error cost approach?

Even if multiple deals were approved at the time because there was genuine uncertainty about their effects and concern about committing 'Type 1' errors (overenforcement), now that much of the uncertainty has resolved and we know many have turned out to be problematic (erecting moats and strengthening ecosystems), doesn't this justify a tougher line?

If a few more deals are opposed than ten years ago, so what? The narrative that startups need exit strategies and if they cannot sell to large incumbents they would lose all incentives to innovate is just a defence old chestnut

for what is a much more variegated landscape (see Visa/Plaid and recently Adobe/Figma, both high-profile deals abandoned because of regulators' opposition but where 'walking away' turned out well for both sides)¹.

More generally, foregoing poorly documented 'efficiencies' claimed from a deal is not a disaster – when put to the test, these are often fragile. Leaving mergers aside: in conduct, consulting economists are trained to come up with 'efficient/pro-competitive' explanations for every conceivable practice – from tying and bundling to exclusivity payments, to loyalty discounts to discrimination.

The economics we practice today in antitrust is not pure, neutral and a-political. It is founded on neoliberal principles that became established as part of a deliberate conservative project started by President Reagan in the 1980s

We know how to model these and show – surprise! – they increase consumer welfare. Economic analysis was useful to establish 20 years ago that a conduct may be benign in some situations, but in the case of entrenched quasi-monopolists in gatekeeping positions we should not credit esoteric efficiency claims and should not allow economists to dream them up.

Yet it is striking how much pushback there is from antitrust economists to the idea of adapting our enforcement practice to the current times. A first problem is the belief that there is a set of precepts – somehow all contained in ‘IO economics’ – which can give us a pure, objective, scientific and a-political assessment of market conduct.

Aside from the enormous hubris and conceit this view entails, it is a stretch on several levels. The economics we practice today in antitrust is not pure, neutral and a-political. It is founded on neoliberal principles that became established as part of a deliberate conservative project started by President Reagan in the 1980s, involving William Baxter (first DOJ’s AAG and later FTC Commissioner) and indeed a contingent of Chicago academics (from Robert Bork to Richard Posner), then exported to Europe in the late 1990s under Commissioner Monti, after the infamous prohibition of GE/Honeywell.

This orientation (pushed hard as the ‘more economic approach’ by consultants who saw also major business opportunities) became established in Europe in the early 2000s. And while things have evolved since (after Chicago we have seen post-Chicago, the empirical IO revolution, etc.) the precepts of ‘efficiency’ and ‘consumer welfare’ remain the guiding lights today for economists inside the agencies and consultants making submissions.

Is this bad? Well, it is an illusion to claim these are neutral principles, pure and a-political. In the main, they tend to support a pro-incumbent assessment. Take the ‘as efficient competitor test’, an established landmark test applied widely in conduct cases that basically says a new entrant which is not ‘as efficient’ as the incumbent should not be in the market – in essence, it deserves to die.

Take the plethora of 'efficiency justifications' for conduct, from exclusive dealing to exclusivity discounts to tying and bundling to price undercutting: competition is 'for the market'; the supplier needs exclusivity to make 'relationship-specific investments' into the customers which would not be justified unless he had all of the demand; profits in an 'aftermarket' are dissipated in the 'beforemarket'; there are economies of scope in supply or demand justifying bundle discounts; and so on.

Some of this may well be true in a few cases, but there is also today a proliferation of these exculpatory narratives, as a set of adaptable narratives that economists pull out on request. Take the way we have badgered regulators that discrimination is output-enhancing in the first place, and therefore not anticompetitive.

Take the way we badgered them about needing a presumption in favour of vertical and conglomerate deals – because of the strength of the 'one monopoly profit' logic ('I don't need to foreclose rivals downstream, I can take my profit elsewhere') and of the 'elimination of double marginalisation' (mostly a chimera).

Take the reluctance to engage with exploitation because it cannot be easily identified, which means every case (from Amazon Buy Box to Apple Spotify) pivots first into exclusion theories that are mostly inapt (the real issue in these cases being rent extraction, not exclusion). Much of the 'analysis' of conduct tends to reflect a DomCo defence playbook.

A further problem is that there is an obstinate siloing of competences, premised on a sense of superiority and detachment that 'we know what we are doing over here, these other policy tools are nothing to do with us, we have a clear solitary superior mission'.

This is another dimension of the conceit of the profession: IO is 'the' dominant economic discipline relevant to antitrust, and nothing else really gets to look in sideways. Business scholars are mostly seen as fluffy because they don't 'do maths' or talk about 'value creation', which is not the point.

Economic historians are irrelevant. Macroeconomics – who cares. Industrial policy – what does it have to do with us? Trade – not even close. Data protection? This is for the Data Protection Agencies over there.

What would be good to see?

My issue is not that enforcement in Europe is lax (it is however impossibly slow), but that the lens we collectively use in this space is too narrow given the state of the world we are in. The mantra has been historically that 'as long as we keep markets competitive, we are doing our jobs', to which we recently added 'we don't know what helping build resilience means'.

We are in a deep hole, and we are witnessing major policy shifts and major rethinks in all areas of economic policy. What would a more open approach look like here? At a minimum, in my view it would require:

- A tough line on mergers. This is already happening (the European Commission and the UK have been more aggressive than in the past, alongside the US agencies). But the runway for landing cases should be a narrow one. We have already allowed multiple deals to roll markets and eliminate production capacity from Europe – from chemicals to pharma to agrochemicals to others.

The excellent *New Merger Guidelines* just issued by the US FTC/DOJ (Federal Trade Commission 2023) contain a (rebuttable) presumption of illegality at given levels of concentration, and more generally have rewritten

the rules of engagements for Parties in merger analysis to reflect much more closely how competition 'presents itself' in the current world: no clear distinction between horizontal/ vertical deals, more serial deals, more platform deals, more conglomerate and vertical deals, more partial ownership, more deals involving worse conditions for labour. This was not the case 15 years ago; it is the case now. These *Guidelines* make a real effort to reflect a new political economy; our equivalent in Europe are obsolete.

- A more explicit stance against concentrated markets (let alone monopolies). Directly recognising concentration is a problem, because market power engenders dysfunctions (and begets inequality). The traditional EU competition law claim that 'being dominant isn't an issue, abusing that dominance is' is also obsolete. Concentration is an issue per se, because significant market power is an issue. Nothing should be allowed that increases or preserves that concentration, regardless of conduct. Structural separation should not be seen as an unthinkable last resort we could never really conceive of.
- Recognising and developing 'ecosystems' analysis. Much of the competitive interaction occurs between ecosystems, no longer in individual markets. We are missing a key dimension of competition for not being able to articulate how concerns might arise from the combination of assets and capabilities, short of a single 'leveraging mechanism' in a given market.
- Enforcing against exploitation, not just exclusion. The nature of concerns especially with large digital platforms is typically exploitation, and rent extraction. Yet a lot of cases (Apple Spotify, Amazon Buy Box, etc) were initially framed as exclusionary cases. What a waste of time. Of course this is because there is court precedent of exclusionary abuses (from Microsoft down) that we do not have for exploitative abuses.

New Art. 102 Guidelines are expected to be released for consultation in the Summer 2024, but it is also expected they will not address exploitation. If so, this is problematic. The FTC in the US can pursue 'unfair method of competition' and although we are also beginning to see 'fairness' as a concern appearing in a few European Commission cases, it is not mainstream.

- Enforcing against discrimination. We have spent two decades telling regulators that discrimination is not a competition issue because it mostly expands output and is therefore pro-competitive. And that it could only possibly be a problem when it leads to rival foreclosure. This is problematic. We do worry about discrimination on multiple grounds short of foreclosure, including inequality. In the US, the FTC has revived discrimination as an area of focus for its enforcement/consumer protection role, and this is an important development.
- Taking up labour market issues. We are relatively oblivious to these in Europe, and we should not.
- Taking up data protection violations explicitly. One of the major learnings of the last five years surely has been that it is market power violations that enable data protection violations at scale, and vice versa it is data protection violations at scale that contribute to creating and preserving market power. Yet we continue only reluctantly to acknowledge the role data plays in market power and its abuse.
- Rethinking the approach to state aid to embrace modern industrial policy, away from the narrow obsession with market failures and efficiency as the only worthwhile pursuit and in the direction of a broader lens, 'European' industrial policy which builds on a grown-up analysis of our shortcomings and needs. This would involve also being involved in actively promoting the creation of sovereign funds for investment in infrastructure.

Note this is not, as some have falsely claimed, an effort to 'expel economics' from enforcement. Far from it. It is a call to be less dogmatic that 'we know best' and 'we have wisdom' and look at what is before us.

More generally, competition regulators should clamour to be part of the current Great Reordering, not be held back by the posse of lawyers, consultants, economists invested in the status quo – as if wisdom had been fully achieved sometime 20 years ago and now just needs to be applied, like Moses Tablets.

The strong reaction in the US to the *Draft New Merger Guidelines* issued in July 2023 was mostly based around 'we got it right in 2010, that reflected the right economic thinking, why change'. Because the new version better fits the world as we see it. The political economy, indeed.

Agencies typically say 'our job is (just) to preserve/restore competition'. Good as that is, they can be a bigger and better part of the solution to the issues that face Europe.

The Spanish Presidency *Resilient EU 2030* 'non paper' calls for a mission 'not just to prevent Europe's decline'; it acknowledges 'the changes experienced in the international order in recent years', and lists the 'multiple strategic vulnerabilities the EU should address in this decade' (including reindustrialisation and rebuilding production capacities, as 'the days of unchecked offshoring and blind reliance on imports are over', enabling local technologies and hosting meaningful debates on emerging challenges) (Spain's National Office of Foresight and Strategy 2023).

Tellingly, the document hardly mentions competition policy, and only in terms of the role of state aid as preserving the 'level playing field' (p.31). To the extent this is because the role of competition regulators is perceived as technocratic and narrow, it is not a good thing.

There is potentially much to be achieved with reorienting competition policy in ways that can be complementary to these broader, existential goals. ■

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Endnote

1. See <https://www.ft.com/content/1ed84bd3-4358-46dd-8d1a-d3f7e45e5e5f> and <https://www.cmswire.com/digital-experience/winners-and-losers-of-the-failed-20b-adobe-figma-deal/>.

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A vision for the future of America

Joe Biden delivers a feisty State of the Union address with vision for the second term, discussing the economy, Ukraine, IVF and abortion protections, and defending democracy

In January 1941, President Franklin Roosevelt came to this chamber to speak to the nation. He said, *"I address you at a moment unprecedented in the history of the Union."* Hitler was on the march. War was raging in Europe. President Roosevelt's purpose was to wake up the Congress and alert the American people that this was no ordinary moment. Freedom and democracy were under assault in the world.

Tonight I come to the same chamber to address the nation. Now it is we who face an unprecedented moment in the history of the Union. And yes, my purpose tonight is to both wake up this Congress and alert the American people that this is no ordinary moment either. Not since President Lincoln and the Civil War have freedom and democracy been under assault here at home as they are today.

What makes our moment rare is that freedom and democracy are under attack, both at home and overseas, at the very same time. Overseas, Putin of Russia is on the march, invading Ukraine and sowing chaos throughout Europe and beyond. If anybody in this room thinks Putin will stop at Ukraine, I assure you, he will not.

But Ukraine can stop Putin if we stand with Ukraine and provide the weapons it needs to defend itself. That is all Ukraine is asking. They are not asking for American soldiers. In fact, there are no American soldiers at war in Ukraine. And I am determined to keep it that way.

But now assistance for Ukraine is being blocked by those who want us to walk away from our leadership in the world. It wasn't that long ago when a Republican President, Ronald Reagan, thundered, *"Mr Gorbachev, tear down this wall."* Now, my predecessor, a former Republican President, tells Putin, *"Do whatever the hell you want."*

A former American President actually said that, bowing down to a Russian leader. It's outrageous. It's dangerous. It's unacceptable. America is a founding member of NATO the military alliance of democratic nations created after World War II to prevent war and keep the peace.

Today, we've made NATO stronger than ever. We welcomed Finland to the Alliance last year, and just this morning, Sweden officially joined NATO, and their Prime Minister is here tonight. Mr Prime Minister, welcome to NATO, the strongest military alliance the world has ever known.

America's comeback is building a future of American possibilities, building an economy from the middle out and the bottom up, not the top down, investing in all of America, in all Americans to make sure everyone has a fair shot and we leave no one behind!

I say this to Congress: we must stand up to Putin. Send me the Bipartisan National Security Bill. History is watching. If the United States walks away now, it will put Ukraine at risk. Europe at risk. The free world at risk, emboldening others who wish to do us harm.

My message to President Putin is simple. We will not walk away. We will not bow down. I will not bow down.

History is watching, just like history watched three years ago on January 6th. Insurrectionists stormed this very Capitol and placed a dagger at the throat of American democracy. Many of you were here on that darkest of days. We all saw with our own eyes these insurrectionists were not patriots. They had come to stop the peaceful transfer of power and to overturn the will of the people.

January 6th and the lies about the 2020 election, and the plots to steal the election, posed the gravest threat to our democracy since the Civil War. But they failed. America stood strong and democracy prevailed. But we must be honest the threat remains and democracy must be defended. My predecessor and some of you here seek to bury the truth of January 6th.

I will not do that. This is a moment to speak the truth and bury the lies. And here's the simplest truth. You can't love your country only when you win. As I've done ever since being elected to office, I ask you all, without regard to party, to join together and defend our democracy!

Remember your oath of office to defend against all threats foreign and domestic. Respect free and fair elections! Restore trust in our institutions! And make clear –political violence has absolutely no place in America! History is watching.

And history is watching another assault on freedom. Joining us tonight is Latorya Beasley, a social worker from Birmingham, Alabama. 14 months ago tonight, she and her husband welcomed a baby girl thanks to the miracle of IVF. She scheduled treatments to have a second child, but the Alabama Supreme Court shut down IVF treatments across the state, unleashed by the Supreme Court decision overturning Roe v. Wade.

She was told her dream would have to wait. What her family has gone through should never have happened. And unless Congress acts, it could happen again. So tonight, let's stand up for families like hers! To my friends across the aisle, don't keep families waiting any longer. Guarantee the right to IVF nationwide!

Like most Americans, I believe Roe v. Wade got it right. And I thank Vice President Harris for being an incredible leader, defending reproductive freedom and so much more. But my predecessor came to office determined to see Roe v. Wade overturned. He's the reason it was overturned. In fact, he brags about it.

Look at the chaos that has resulted. Joining us tonight is Kate Cox, a wife and mother from Dallas. When she became pregnant again, the foetus had a fatal condition. Her doctors told Kate that her own life and her ability to have children in the future were at risk if she didn't act.

Because Texas law banned abortion, Kate and her husband had to leave the state to get the care she needed. What her family has gone through should never have happened as well. But it is happening to so many others.

There are state laws banning the right to choose, criminalizing doctors, and forcing survivors of rape and incest to leave their states as well to get the care they need.

Many of you in this Chamber and my predecessor are promising to pass a national ban on reproductive freedom. My God, what freedoms will you take away next? In its decision to overturn Roe v. Wade the Supreme Court majority wrote, *"Women are not without – electoral or political power."* No kidding.

Clearly, those bragging about overturning Roe v. Wade have no clue about the power of women in America. They found out though when reproductive freedom was on the ballot and won in 2022, 2023, and they will find out again, in 2024. If Americans send me a Congress that supports the right to choose, I promise you, I will restore Roe v. Wade as the law of the land again!

America cannot go back. I am here tonight to show the way forward. Because I know how far we've come. Four years ago next week, before I came to office, our country was hit by the worst pandemic and the worst economic crisis in a century.

Remember the fear. Record job losses. Remember the spike in crime. And the murder rate. A raging virus that would take more than 1 million American lives and leave millions of loved ones behind. A mental health crisis of isolation and loneliness.

A president, my predecessor, who failed the most basic duty. Any President owes the American people the duty to care. That is unforgivable. I came to office determined to get us through one of the toughest periods in our nation's history.

And we have. It doesn't make the news but in thousands of cities and towns the American people are writing the greatest comeback story never told. So let's tell that story here and now.

America's comeback is building a future of American possibilities, building an economy from the middle out and the bottom up, not the top down, investing in all of America, in all Americans to make sure everyone has a fair shot and we leave no one behind!

The pandemic no longer controls our lives. The vaccines that saved us from COVID are now being used to help beat cancer. Turning setback into comeback. That's America!

I inherited an economy that was on the brink. Now our economy is the envy of the world! 15 million new jobs in just three years – that's a record! Unemployment at 50-year lows. A record 16 million Americans are starting small businesses and each one is an act of hope.

With historic job growth and small business growth for Black, Hispanic, and Asian-Americans. 800,000 new manufacturing jobs in America and counting. More people have health insurance today than ever before. The racial wealth gap is the smallest it's been in 20 years.

Wages keep going up and inflation keeps coming down! Inflation has dropped from 9% to 3% – the lowest in the world! And trending lower. And now instead of importing foreign products and exporting American jobs, we're exporting American products and creating American jobs – right here in America where they belong!

And the American people are beginning to feel it. Consumer studies show consumer confidence is soaring. Buy American has been the law of the land since the 1930s. Past administrations including my predecessor failed to Buy American. Not any more.

On my watch, federal projects like helping to build American roads bridges and highways will be made with American products built by American workers creating good-paying American jobs! Thanks to my Chips and Science Act the United States is investing more in research and development than ever before.

During the pandemic a shortage of semiconductor chips drove up prices for everything from cell phones to automobiles. Well instead of having to import semiconductor chips, which America invented I might add, private companies are now investing billions of dollars to build new chip factories here in America!

Creating tens of thousands of jobs many of them paying over \$100,000 a year and don't require a college degree. In fact my policies have attracted \$650 billion of private sector investments in clean energy and advanced manufacturing creating tens of thousands of jobs here in America!

Thanks to our Bipartisan Infrastructure Law, 46,000 new projects have been announced across your communities – modernizing our roads and bridges, ports and airports, and public transit systems.

Removing poisonous lead pipes so every child can drink clean water without risk of getting brain damage. Providing affordable high-speed internet for every American no matter where you live. Urban, suburban, and rural communities — in red states and blue. Record investments in tribal communities.

Because of my investments, family farms are better be able to stay in the family and children and grandchildren won't have to leave home to make a living. It's transformative.

A great comeback story is Belvidere, Illinois. Home to an auto plant for nearly 60 years. Before I came to office the plant was on its way to shutting down. Thousands of workers feared for their livelihoods. Hope was fading. Then

I was elected to office and we raised Belvidere repeatedly with the auto company knowing unions make all the difference.

The UAW worked like hell to keep the plant open and get those jobs back. And together, we succeeded! Instead of an auto factory shutting down an auto factory is re-opening and a new state-of-the art battery factory is being built to power those cars. Instead of a town being left behind it's a community moving forward again!

Because instead of watching auto jobs of the future go overseas 4,000 union workers with higher wages will be building that future, in Belvidere, here in America! Here tonight is UAW President, Shawn Fain, a great friend, and a great labour leader. And Dawn Simms, a third generation UAW worker in Belvidere. Shawn, I was proud to be the first President in American history to walk a picket line.

And today Dawn has a job in her hometown providing stability for her family and pride and dignity. Showing once again, Wall Street didn't build this country! The middle class built this country! And unions built the middle class! When Americans get knocked down, we get back up! We keep going!

That's America! That's you, the American people! It's because of you America is coming back! It's because of you, our future is brighter! And it's because of you that we can proudly say the State of our Union is strong and getting stronger!

Tonight I want to talk about the future of possibilities that we can build together. A future where the days of trickle-down economics are over and the wealthy and biggest corporations no longer get all the breaks.

I grew up in a home where not a lot trickled down on my Dad's kitchen table. That's why I'm determined to turn things around so the middle class does well the poor have a way up and the wealthy still does well. We all do well.

And there's more to do to make sure you're feeling the benefits of all we're doing. Americans pay more for prescription drugs than anywhere else. It's wrong and I'm ending it. With a law I proposed and signed and not one Republican voted for we finally beat Big Pharma!

Instead of paying \$400 a month for insulin seniors with diabetes only have to pay \$35 a month! And now I want to cap the cost of insulin at \$35 a month for every American who needs it! For years people have talked about it but I finally got it done and gave Medicare the power to negotiate lower prices for prescription drugs just like the VA does for our veterans.

That's not just saving seniors money. It's saving taxpayers money cutting the federal deficit by \$160 billion because Medicare will no longer have to pay exorbitant prices to Big Pharma. This year Medicare is negotiating lower prices for some of the costliest drugs on the market that treat everything from heart disease to arthritis.

Now it's time to go further and give Medicare the power to negotiate lower prices for 500 drugs over the next decade. That will not only save lives it will save taxpayers another \$200 billion!

Starting next year that same law caps total prescription drug costs for seniors on Medicare at \$2,000 a year even for expensive cancer drugs that can cost \$10,000, \$12,000, \$15,000 a year.

Now I want to cap prescription drug costs at \$2,000 a year for everyone! Folks Obamacare, known as the Affordable Care Act is still a very big deal. Over one hundred million of you can no longer be denied health insurance because of pre-existing conditions.

But my predecessor and many in this chamber want to take that protection away by repealing the Affordable Care Act I won't let that happen! We stopped you 50 times before and we will stop you again! In fact I am protecting it and expanding it. I enacted tax credits that save \$800 per person per year reducing health care premiums for millions of working families. Those tax credits expire next year. I want to make those savings permanent!

Women are more than half of our population but research on women's health has always been underfunded. That's why we're launching the first-ever White House Initiative on Women's Health Research, led by Jill who is doing an incredible job as First Lady. Pass my plan for \$12 billion to transform women's health research and benefit millions of lives across America!

I know the cost of housing is so important to you. If inflation keeps coming down mortgage rates will come down as well. But I'm not waiting. I want to provide an annual tax credit that will give Americans \$400 a month for the next two years as mortgage rates come down to put toward their mortgage when they buy a first home or trade up for a little more space. My Administration is also eliminating title insurance fees for federally backed mortgages. When you refinance your home this can save you \$1,000 or more.

For millions of renters, we're cracking down on big landlords who break antitrust laws by price-fixing and driving up rents. I've cut red tape so more builders can get federal financing, which is already helping build a record 1.7 million housing units nationwide. Now pass my plan to build and renovate 2 million affordable homes and bring those rents down!

To remain the strongest economy in the world we need the best education system in the world. I want to give every child a good start by providing access to pre-school for 3- and 4-year-olds. Studies show that children who go to pre-school are nearly 50% more likely to finish high school and go on to earn a 2- or 4-year degree no matter their background.

I want to expand high-quality tutoring and summer learning time and see to it that every child learns to read by third grade. I'm also connecting businesses and high schools so students get hands-on experience and a path to a good-paying job whether or not they go to college.

And I want to make college more affordable. Let's continue increasing Pell Grants for working- and middle-class families and increase our record investments in HBCUs and Hispanic and Minority-serving Institutions

I fixed student loan programs to reduce the burden of student debt for nearly 4 million Americans including nurses firefighters and others in public service like Keenan Jones a public-school educator in Minnesota who's here with us tonight. He's educated hundreds of students so they can go to college now he can help his own daughter pay for college.

Such relief is good for the economy because folks are now able to buy a home start a business even start a family. While we're at it I want to give public school teachers a raise!

Now let me speak to a question of fundamental fairness for all Americans. I've been delivering real results in a fiscally responsible way. I've already cut the federal deficit by over one trillion dollars. I signed a bipartisan budget deal that will cut another trillion dollars over the next decade. And now it's my goal to cut the federal deficit \$3 trillion more by making big corporations and the very wealthy finally pay their fair share.

Look, I'm a capitalist. If you want to make a million bucks – great! Just pay your fair share in taxes. A fair tax code is how we invest in the things – that make a country great, health care, education, defense, and more.

But here's the deal. The last administration enacted a \$2 trillion tax cut that overwhelmingly benefits the very wealthy and the biggest corporations and exploded the federal deficit. They added more to the national debt than in any presidential term in American history.

For folks at home does anybody really think the tax code is fair? Do you really think the wealthy and big corporations need another \$2 trillion in tax breaks? I sure don't. I'm going to keep fighting like hell to make it fair!

Under my plan nobody earning less than \$400,000 will pay an additional penny in federal taxes. Nobody. Not one penny.

In fact the Child Tax Credit I passed during the pandemic cut taxes for millions of working families and cut child poverty in HALF. Restore the Child Tax Credit because no child should go hungry in this country!

The way to make the tax code fair is to make big corporations and the very wealthy finally pay their share. In 2020 55 of the biggest companies in America made \$40 billion in profits and paid zero in federal income taxes. Not any more!

Thanks to the law I wrote and signed big companies now have to pay a minimum of 15%. But that's still less than working people pay in federal taxes. It's time to raise the corporate minimum tax to at least 21% so every big corporation finally begins to pay their fair share.

I also want to end the tax breaks for Big Pharma, Big Oil, private jets, and massive executive pay! End it now! There are 1,000 billionaires in America. You know what the average federal tax rate for these billionaires is? 8.2 percent!

That's far less than the vast majority of Americans pay. No billionaire should pay a lower tax rate than a teacher, a sanitation worker, a nurse! That's why I've proposed a minimum tax of 25% for billionaires. Just 25%.

That would raise \$500 billion over the next 10 years. Imagine what that could do for America. Imagine a future with affordable childcare so millions of families can get the care they need and still go to work and help grow the economy.

Imagine a future with paid leave because no one should have to choose between working and taking care of yourself or a sick family member. Imagine a future with home care and elder care so seniors and people living with disabilities can stay in their homes and family caregivers get paid what they deserve!

Tonight, let's all agree once again to stand up for seniors! Many of my Republican friends want to put Social Security on the chopping block. If anyone here tries to cut Social Security or Medicare or raise the retirement age I will stop them!

Working people who built this country pay more into Social Security than millionaires and billionaires do. It's not fair. We have two ways to go on Social Security. Republicans will cut Social Security and give more tax cuts to the wealthy. I will protect and strengthen Social Security and make the wealthy pay their fair share!

Too many corporations raise their prices to pad their profits charging you more and more for less and less. That's why we're cracking down on corporations that engage in price gouging or deceptive pricing from food to health care to housing. In fact, snack companies think you won't notice when they charge you just as much for the same size bag but with fewer chips in it. Pass Senator Bob Casey's bill to put a stop to shrinkflation!

I'm also getting rid of junk fees those hidden fees added at the end of your bills without your knowledge. My administration just announced we're cutting credit card late fees from \$32 to just \$8. The banks and credit card companies don't like it. Why? I'm saving American families \$20 billion a year with all of the junk fees I'm eliminating. And I'm not stopping there.

My Administration has proposed rules to make cable travel utilities and online ticket sellers tell you the total price upfront so there are no surprises. It matters.

And so does this. In November, my team began serious negotiations with a bipartisan group of Senators. The result was a bipartisan bill with the toughest set of border security reforms we've ever seen in this country.

That bipartisan deal would hire 1,500 more border security agents and officers. 100 more immigration judges to help tackle a backload of 2 million cases. 4,300 more asylum officers and new policies so they can resolve cases in 6 months instead of 6 years. 100 more high-tech drug detection machines to significantly increase the ability to screen and stop vehicles from smuggling fentanyl into America.

This bill would save lives and bring order to the border. It would also give me as President new emergency authority to temporarily shut down the border when the number of migrants at the border is overwhelming. The Border Patrol Union endorsed the bill. The Chamber of Commerce endorsed the bill. I believe that given the opportunity a majority of the House and Senate would endorse it as well. But unfortunately, politics have derailed it so far.

I'm told my predecessor called Republicans in Congress and demanded they block the bill. He feels it would be a political win for me and a political loser for him. It's not about him or me. It'd be a winner for America! My Republican friends you owe it to the American people to get this bill done. We need to act.

And if my predecessor is watching instead of playing politics and pressuring members of Congress to block this bill, join me in telling Congress to pass it! We can do it together. But here's what I will not do. I will not demonize immigrants saying they *"poison the blood of our country"* as he said in his own words.

I will not separate families. I will not ban people from America because of their faith. Unlike my predecessor, on my first day in office I introduced a comprehensive plan to fix our immigration system, secure the border, and provide a pathway to citizenship for Dreamers and so much more.

Because unlike my predecessor, I know who we are as Americans. We are the only nation in the world with a heart and soul that draws from old and new. Home to Native Americans whose ancestors have been here for thousands of years. Home to people from every place on Earth. Some came freely. Some chained by force. Some when famine struck, like my ancestral family in Ireland. Some to flee persecution. Some to chase dreams that are impossible anywhere but here in America.

That's America, where we all come from somewhere, but we are all Americans. We can fight about the border, or we can fix it. I'm ready to fix it. Send me the border bill now!

A transformational moment in our history happened 59 years ago today in Selma, Alabama. Hundreds of foot soldiers for justice marched across the Edmund Pettus Bridge, named after a Grand Dragon of the KKK, to claim their fundamental right to vote. They were beaten bloodied and left for dead.

Our late friend and former colleague John Lewis was at the march. We miss him. Joining us tonight are other marchers who were there including Betty May Fikes, known as the 'Voice of Selma'. A daughter of gospel singers and

preachers, she sang songs of prayer and protest on that Bloody Sunday, to help shake the nation's conscience. Five months later, the Voting Rights Act was signed into law. But 59 years later, there are forces taking us back in time.

Voter suppression. Election subversion. Unlimited dark money. Extreme gerrymandering. John Lewis was a great friend to many of us here. But if you truly want to honour him and all the heroes who marched with him, then it's time for more than just talk. Pass and send me the Freedom to Vote Act and the John Lewis Voting Rights Act! And stop denying another core value of America our diversity across American life.

Banning books. It's wrong! Instead of erasing history, let's make history! I want to protect other fundamental rights! Pass the Equality Act, and my message to transgender Americans: I have your back! Pass the PRO Act for workers rights! And raise the federal minimum wage because every worker has the right to earn a decent living!

We are also making history by confronting the climate crisis, not denying it. I'm taking the most significant action on climate ever in the history of the world. I am cutting our carbon emissions in half by 2030.

Creating tens of thousands of clean-energy jobs, like the IBEW workers building and installing 500,000 electric vehicle charging stations. Conserving 30% of America's lands and waters by 2030. Taking historic action on environmental justice for fence-line communities smothered by the legacy of pollution.

And patterned after the Peace Corps and Ameri Corps, I've launched a Climate Corps to put 20,000 young people to work at the forefront of our clean energy future. I'll triple that number this decade.

All Americans deserve the freedom to be safe, and America is safer today than when I took office. The year before I took office, murders went up 30% nationwide the biggest increase in history. That was then.

Now, through my American Rescue Plan, which every Republican voted against, I've made the largest investment in public safety ever. Last year, the murder rate saw the sharpest decrease in history, and violent crime fell to one of the lowest levels in more than 50 years. But we have more to do.

Help cities and towns invest in more community police officers, more mental health workers, and more community violence intervention. Give communities the tools to crack down on gun crime, retail crime, and carjacking. Keep building public trust, as I've been doing by taking executive action on police reform, and calling for it to be the law of the land, directing my Cabinet to review the federal classification of marijuana, and expunging thousands of convictions for mere possession, because no one should be jailed for using or possessing marijuana!

To take on crimes of domestic violence, I am ramping up federal enforcement of the Violence Against Women Act, that I proudly wrote, so we can finally end the scourge of violence against women in America!

And there's another kind of violence I want to stop. With us tonight is Jasmine, whose 9-year-old sister Jackie was murdered with 21 classmates and teachers at her elementary school in Uvalde, Texas. Soon after it happened, Jill and I went to Uvalde and spent hours with the families. We heard their message, and so should everyone in this chamber do something.

I did do something by establishing the first-ever Office of Gun Violence Prevention in the White House that Vice President Harris is leading. Meanwhile, my predecessor told the NRA he's proud he did nothing on guns when he was President. After another school shooting in Iowa he said we should just "*get over it*." I say we must stop it.

I'm proud we beat the NRA when I signed the most significant gun safety law in nearly 30 years! Now we must beat the NRA again! I'm demanding a ban on assault weapons and high-capacity magazines! Pass universal background checks! None of this violates the Second Amendment or vilifies responsible gun owners.

As we manage challenges at home, we're also managing crises abroad including in the Middle East. I know the last five months have been gut-wrenching for so many people, for the Israeli people, the Palestinian people, and so many here in America.

This crisis began on October 7th with a massacre by the terrorist group Hamas. 1,200 innocent people women and girls men and boys slaughtered, many enduring sexual violence. The deadliest day for the Jewish people since the Holocaust. 250 hostages taken.

Here in the chamber tonight are American families whose loved ones are still being held by Hamas. I pledge to all the families that we will not rest until we bring their loved ones home. We will also work around the clock to bring home Evan and Paul, Americans being unjustly detained all around the world.

Israel has a right to go after Hamas. Hamas could end this conflict today by releasing the hostages, laying down arms, and surrendering those responsible for October 7th. Israel has an added burden because Hamas hides and operates among the civilian population. But Israel also has a fundamental responsibility to protect innocent civilians in Gaza.

This war has taken a greater toll on innocent civilians than all previous wars in Gaza combined. More than 30,000 Palestinians have been killed. Most of whom are not Hamas. Thousands and thousands are innocent women and children. Girls and boys also orphaned. Nearly 2 million more Palestinians under bombardment or displaced. Homes destroyed, neighbourhoods in rubble, cities in ruin. Families without food, water, medicine. It's heartbreaking.

We've been working non-stop to establish an immediate ceasefire that would last for at least six weeks. It would get the hostages home, ease the intolerable humanitarian crisis, and build toward something more enduring. The United States has been leading international efforts to get more humanitarian assistance into Gaza.

Tonight, I'm directing the US military to lead an emergency mission to establish a temporary pier in the Mediterranean on the Gaza coast that can receive large ships carrying food, water, medicine and temporary shelters. No US boots will be on the ground. This temporary pier would enable a massive increase in the amount of humanitarian assistance getting into Gaza every day.

But Israel must also do its part. Israel must allow more aid into Gaza and ensure that humanitarian workers aren't caught in the crossfire. To the leadership of Israel I say this. Humanitarian assistance cannot be a secondary consideration or a bargaining chip. Protecting and saving innocent lives has to be a priority.

As we look to the future, the only real solution is a two-state solution. I say this as a lifelong supporter of Israel and the only American president to visit Israel in wartime. There is no other path that guarantees Israel's security and democracy. There is no other path that guarantees Palestinians can live with peace and dignity.

There is no other path that guarantees peace between Israel and all of its Arab neighbours, including Saudi Arabia. Creating stability in the Middle East also means containing the threat posed by Iran. That's why I built a coalition of more than a dozen countries to defend international shipping and freedom of navigation in the Red Sea.

I've ordered strikes to degrade Houthi capabilities and defend US Forces in the region. As Commander in Chief, I will not hesitate to direct further measures to protect our people and military personnel.

For years, all I've heard from my Republican friends and so many others is China's on the rise and America is falling behind. They've got it backward. America is rising.

We have the best economy in the world. Since I've come to office, our GDP is up. And our trade deficit with China is down to the lowest point in over a decade. We're standing up against China's unfair economic practices. And standing up for peace and stability across the Taiwan Strait.

I've revitalized our partnerships and alliances in the Pacific. I've made sure that the most advanced American technologies can't be used in China's weapons. Frankly for all his tough talk on China, it never occurred to my predecessor to do that.

We want competition with China, but not conflict. And we're in a stronger position to win the competition for the 21st Century against China or anyone else for that matter.

Here at home I've signed over 400 bipartisan bills. But there's more to do to pass my Unity Agenda. Strengthen penalties on fentanyl trafficking. Pass bipartisan privacy legislation to protect our children online. Harness the promise of AI and protect us from its peril. Ban AI voice impersonation and more!

And keep our one truly sacred obligation, to train and equip those we send into harm's way and care for them and their families when they come home, and when they don't. That's why I signed the PACT Act, one of the most significant laws ever, helping millions of veterans who were exposed to toxins and who now are battling more than 100 cancers.

Many of them didn't come home. We owe them and their families. And we owe it to ourselves to keep supporting our new health research agency called ARPA-H and remind us that we can do big things like end cancer as we know it!

Let me close with this. I know I may not look like it, but I've been around a while. And when you get to my age certain things become clearer than ever before. I know the American story. Again and again I've seen the contest between competing forces in the battle for the soul of our nation. Between those who want to pull America back to the past and those who want to move America into the future.

My lifetime has taught me to embrace freedom and democracy. A future based on the core values that have defined America. Honesty. Decency. Dignity. Equality. To respect everyone. To give everyone a fair shot. To give hate no safe harbour.

Now some other people my age see a different story. An American story of resentment, revenge, and retribution. That's not me. I was born amid World War II when America stood for freedom in the world. I grew up in Scranton, Pennsylvania and Claymont, Delaware among working people who built this country.

I watched in horror as two of my heroes, Dr King and Bobby Kennedy, were assassinated and their legacies inspired me to pursue a career in service. A public defender, county councilman, elected United States Senator at 29, then Vice President, to our first Black President, now President, with our first woman Vice President.

In my career I've been told I'm too young and I'm too old. Whether young or old, I've always known what endures. Our North Star. The very idea of America, that we are all created equal and deserve to be treated equally throughout our lives.

We've never fully lived up to that idea, but we've never walked away from it either. And I won't walk away from it now. My fellow Americans the issue facing our nation isn't how old we are it's how old our ideas are? Hate, anger,

revenge, retribution are among the oldest of ideas. But you can't lead America with ancient ideas that only take us back.

To lead America, the land of possibilities, you need a vision for the future of what America can and should be. Tonight you've heard mine. I see a future where we defend democracy not diminish it.

I see a future where we restore the right to choose and protect other freedoms not take them away. I see a future where the middle class finally has a fair shot and the wealthy finally have to pay their fair share in taxes. I see a future where we save the planet from the climate crisis and our country from gun violence. Above all, I see a future for all Americans!

I see a country for all Americans! And I will always be a president for all Americans! Because I believe in America! I believe in you the American people. You're the reason I've never been more optimistic about our future!

So let's build that future together! Let's remember who we are! We are the United States of America. There is nothing beyond our capacity when we act together! May God bless you all. May God protect our troops. ■

Joe Biden is President of the United States

This article is based on remarks of President Joe Biden's State of the Union address 2024.



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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 together¹. 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 element²).

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 Schöhlhorn of the German economics ministry, with Hans Tietmeyer as his alternate), the Budget Policy Committee (Gaetano Stammatti 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”*³.

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)⁴.

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)⁵.

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 propension 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 prématuré”* (*“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 Larosi re 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)⁶.

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 issue⁷.

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 accordingly⁸. 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 function⁹.

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 concluded¹⁰. 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 involved¹¹, 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 25th 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) Launch CMU	Triggering of the SGP General Escape Clause State Aid Temporary Framework NGEU Support to mitigate Unemployment Risks in an Emergency (SURE)	Economic governance reform (ongoing) State Aid Temporary Framework + 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.

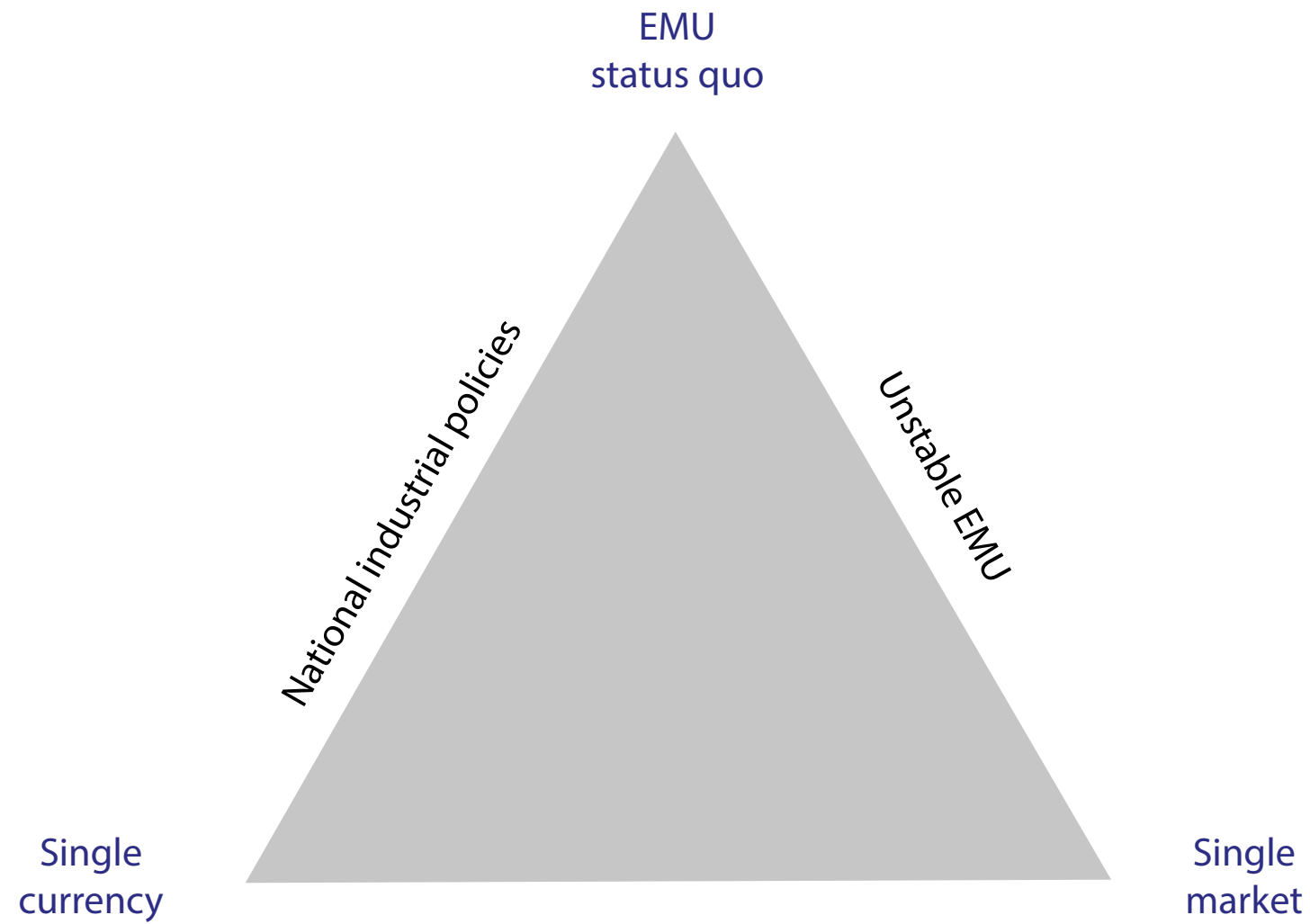
The experience during the energy crisis and the response to the American Inflation Reduction Act (IRA) is telling. A resilient euro area, with enough stabilisation tools in place, is essential to prevent member states from going down a route that would lead to 'real' fragmentation, up to creating risks 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)¹. 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 country². Second, a reduction in transaction and hedging costs for users of the currency. Third, the 'exorbitant privilege'³: 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 position⁴.

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 appreciation⁵.

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 spillbacks⁶.

All in all, the macroeconomic benefits of issuing a reserve currency should largely outweigh the risks⁷. 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 ½ percentage point of GDP per year⁸. These numbers are purely indicative, but they may give us an idea of the magnitude of the potential gains⁹.

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 renminbi¹⁰, and the share of Chinese trade settled in renminbi has doubled over the past three years¹¹. As a result, at the end of 2023, the renminbi overtook the euro as the second most used currency for trade finance¹² and the yen as the fourth most used currency for global payments¹³.

There is little evidence so far that political fragmentation is *systematically* translating into currency fragmentation¹⁴, 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)¹⁵. 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'¹⁶. 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.

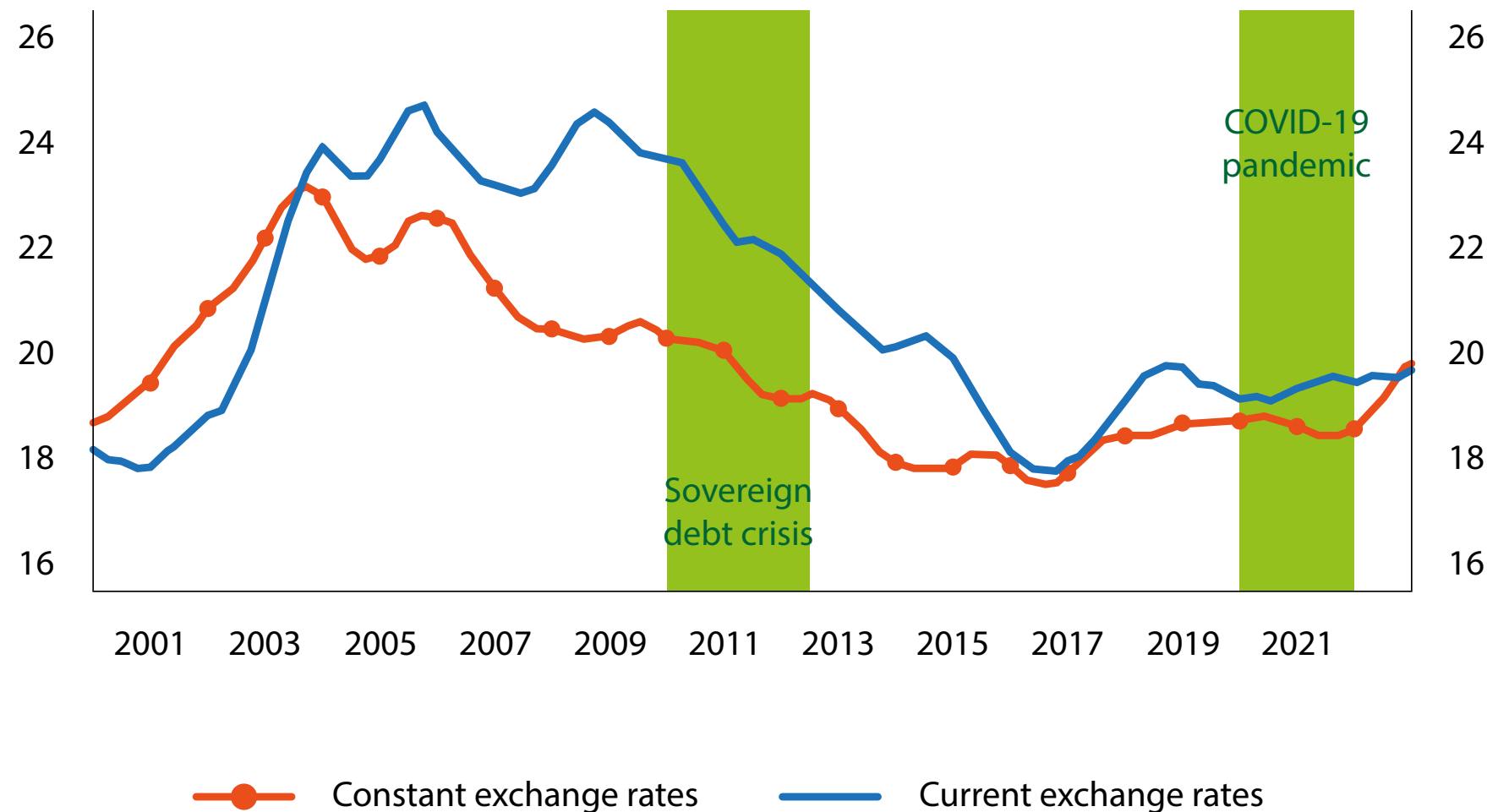
As a result, a fault line emerged between a 'core' and a 'periphery', leading to deep economic, social and political divisions. Investors believed that the euro area could break up under pressure.

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 storm¹⁷.

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)

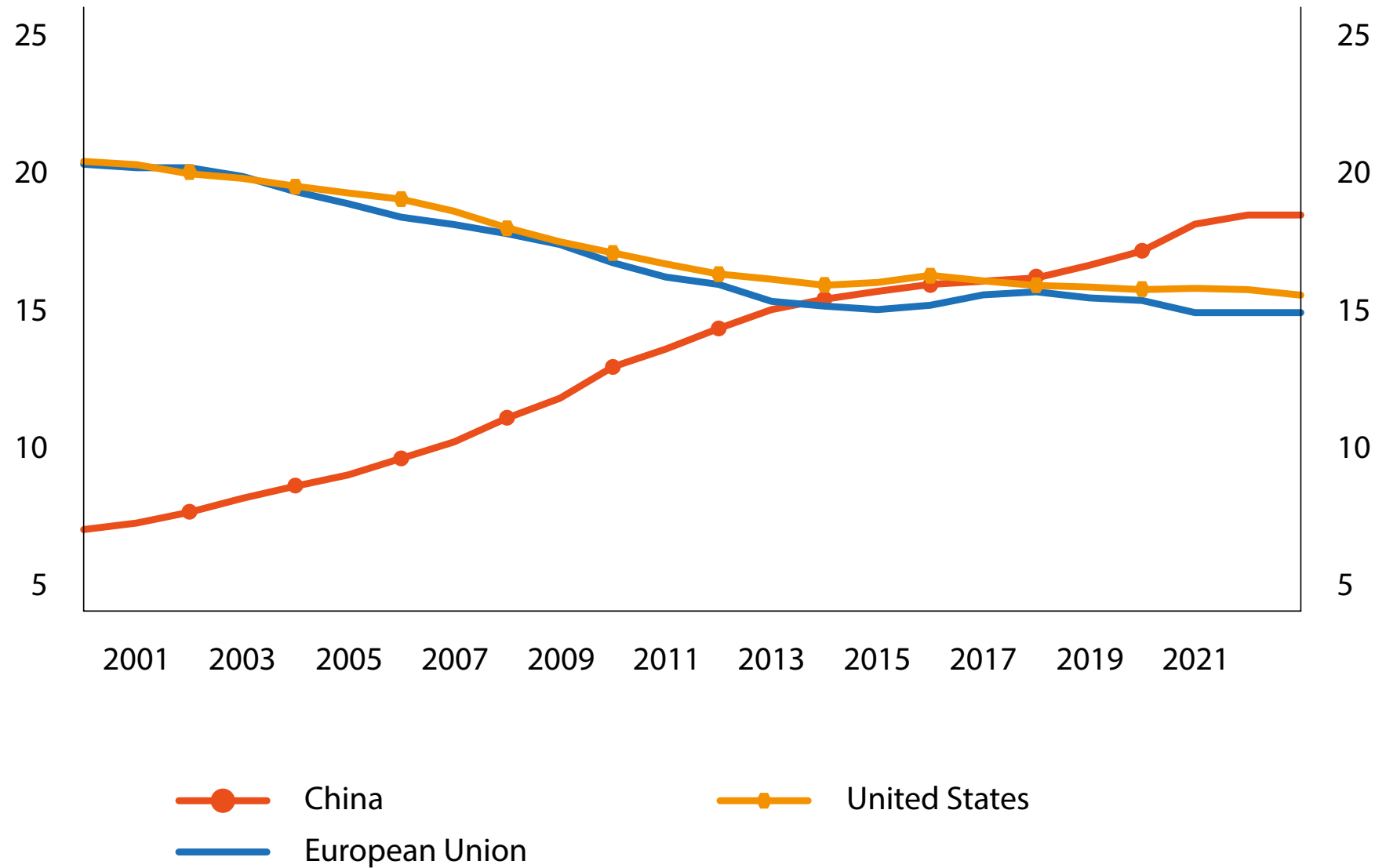


(1) Four-quarter moving average, at current and constant Q4 2022 exchange rates. Arithmetic average of the shares of the euro in stocks of international bonds, loans by banks outside the euro area to borrowers outside the euro area, deposits with banks outside the euro area from creditors outside the 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 declared¹⁸, 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 aspirations¹⁹.

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.

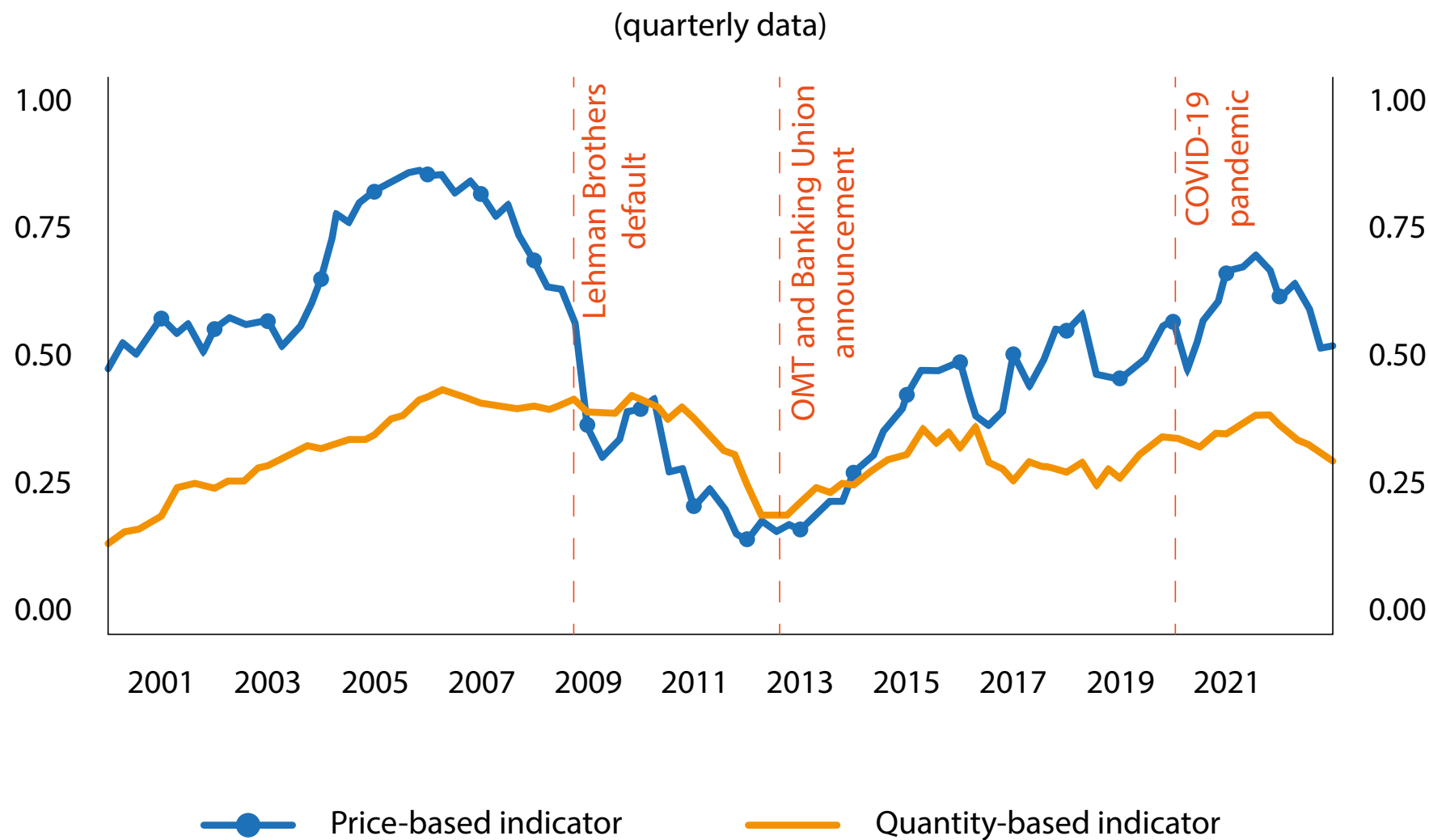
It would facilitate the pricing of risky financial products such as corporate bonds or derivatives, thereby stimulating their development. It would provide a common form of collateral for use in centralized clearing activities and crossborder collateralized trading in interbank markets.

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 euro²⁰.

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 assets²¹. 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 success²².

3.3 Payment systems and market infrastructure

The third component is payment and market infrastructures fit for the 21st 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 pandemic²³.

In this landscape, a central bank digital currency (CBDC) can play an important role²⁴. 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 payments²⁵.

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 decades²⁶.

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 infrastructure²⁷. 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 countries²⁸; (ii) developing the Eurosystem Collateral Management System²⁹; (iii) adopting the new EU Regulation on Markets in Crypto Assets (MiCA) to regulate the cryptoasset ecosystem³⁰; (iv) adopting the Eurosystem's Cyber-resilience strategy for Financial Market Infrastructures³¹; 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 counterparties³².

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 inclusive³³.

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 Union³⁴.

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. ■

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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. Ilzetzi, 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 Plooi, '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).

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.

Modernising finance: the role of central bank money

The payments system is being transformed. Piero Cipollone argues that central banks need to be at the vanguard of digital transformation to ensure financial stability

Since their inception, central banks have continuously adapted to the changing requirements of the payment sector. They have also taken a keen interest in ensuring it functions smoothly, to protect financial stability and the implementation of monetary policy. Central banks provide the financial system with a safe asset at its core: central bank money. Convertibility into central bank money is what keeps the value of private money stable. And the pivotal role played by central bank money is what connects all the different parts of the payments system. In short, central bank money ensures the singleness of money and the integration of the payments system.

This is particularly valuable in a monetary union like the euro area: central bank money – cash or reserves – can be used to settle transactions from and to all parts of the euro area. This ensures that one euro in Lisbon is the same as one euro in Riga.

But for central bank money to retain its stabilising and unifying role, it must stay at the forefront of technology to ensure it remains an attractive means of settling payment transactions. There is no reason why central banks should be the only stakeholders not keeping pace with the digital transformation.

In fact, they should be at the vanguard of this transformation, acting as an anchor of stability for financial innovation and providing a safe path for modernising finance. The Eurosystem is working to maintain this role.

This is true for retail payments. That is why we are working on a digital euro, so that everyone can use central bank money not just in its current physical form – cash – but also in digital form¹.

Today, however, I will focus on new technologies for settling transactions between financial institutions in central bank money, often referred to as wholesale CBDC to distinguish it from retail CBDC, which is used by the general public.

Historically, central banks have played a key role in simplifying the settlement of these transactions, supporting and often leading the transition from physical forms of money to book-entry formats, and to the electronic clearing and settlement of payments, making it possible to update accounts almost instantaneously².

We now find ourselves on the brink of another significant shift: the advent of tokenisation. According to market participants³, digitally representing claims using distributed ledger technology (DLT)⁴ has great potential. However, this transformation could redefine current financial intermediation and wholesale settlement structures.

We must be cautious that innovations do not undermine the stabilising role of central bank money in settling transactions among financial institutions

To enable central bank money to continue performing its stabilising role, even as the financial system undergoes this transformation, we need to find technological solutions that will allow it to also be used to settle transactions recorded on new DLT platforms.

Let me now explain the role central bank money currently plays as an anchor of stability for wholesale payments. I will then discuss the promises and risks of new technologies for wholesale payments before telling you a little more about how we are exploring new technologies for central bank money settlement of wholesale transactions.

Central bank money as an anchor of stability for wholesale payments

While 'wholesale CBDC' is generally presented as something new, made possible by the emergence of DLT, central bank money has in fact been available in digital form for wholesale transactions between banks for decades⁵.

In 2022 the Eurosystem's large-value payment system, TARGET2 (T2), processed 92% of the total value settled by large-value payment systems in euro and remained one of the largest payment systems worldwide, processing 102.6 million transactions amounting to €570.5 trillion⁶. In other words, every six business days T2 settles transactions equivalent to the euro area's annual GDP.

Financial institutions use central bank money mainly for two reasons. First, central banks issue the safest and most liquid settlement asset, avoiding the credit and liquidity risks associated with private money systems. Being able to convert into central bank money the money that commercial banks issue strengthens public confidence in private means of payment. This in turn reassures market participants that the value of a euro is the same, regardless of its issuer.

Second, settling in central bank money limits the risk associated with wholesale financial markets of payment activities becoming concentrated in individual players.

The widespread use of central bank money to settle wholesale payments therefore minimises the risks for the financial system as a whole and provides an anchor of stability for payments. International standards recognise how crucial this is⁷.

That's why the Eurosystem has continued to modernise its market infrastructure services to make them future-proof and ensure they can meet the needs and expectations of market participants.

In March 2023 a new T2 platform was launched, providing modernised services, enhanced cyber protection and optimised liquidity management across all TARGET services. The platform aligns with ISO 20022, facilitating the exchange at global level of more granular data in a more structured manner.

Moreover, in November we will launch the European Collateral Management System, a unified system for managing assets used as collateral in Eurosystem credit operations that will ensure collateral flows freely across the euro area, contributing to financial integration.

In the context of securities settlement systems, the EU is also considering a shift from T+2 settlement to T+1 or even T+0, potentially decreasing counterparty credit risk and collateral needs⁸.

Successfully implementing this change requires careful analysis of costs and strong coordination between all market players. At the same time, we must take into account that other jurisdictions, such as the United States, are making the transition to shorter settlement cycles⁹.

While experience suggests that the coexistence of different settlement cycles in the EU and other non-EU jurisdictions is feasible at the technical level¹⁰, we must prevent this mismatch in settlement times from weighing on the attractiveness of European capital markets.

We must therefore carefully consider whether, and how, to harness the benefits of aligning standard settlement cycles across major jurisdictions, provided this does not impair the smooth functioning of EU financial markets and financial market infrastructures.

Alongside these challenges of a more traditional nature, we also face challenges relating to the rapid digitalisation of the economy. While the market is calling for standard transactions to be settled more efficiently, it is also calling for solutions to accommodate new use cases. As central bankers, we have to monitor these developments closely and be prepared to respond to them.

New technologies for wholesale payments: promises and risks

The advent of blockchain technology has spurred experimentation among a broad range of market players, including banks and financial market infrastructures.

The application of distributed ledger technology to wholesale financial transactions is still at the exploratory stage, despite the financial industry's strong interest in DLT. Currently only around 22% of European banks use DLT, while another 22% are testing or experimenting with it¹¹.

But a majority of market stakeholders surveyed by the Eurosystem expect a significant uptake of DLT for wholesale payments and securities settlement in the next five to ten years¹².

The benefits of DLT for trading financial assets are twofold. First, it can enhance efficiency by allowing market participants to perform the three key phases of a transaction – trading, settlement and custody – on the same distributed ledger. Of the many advantages this offers, participants mention lower credit risk, fewer failed transactions and less need for extensive reconciliation.

DLT can operate on a 24/7 basis, which would tackle the issue of international market fragmentation caused by different time zones. Lastly, the use of smart contracts¹³ can help streamline the process of verifying and executing transactions.

Second, DLT opens avenues for new applications, such as providing new ways to raise capital and trade financial instruments. A shared platform could make the trading of financial instruments more efficient and resilient, particularly those not currently serviced by financial market infrastructures like over-the-counter traded securities or credit claims.

Thanks to lower costs and reduced complexity, DLT platforms could be more easily accessed by small and medium-sized enterprises (SMEs). This would underpin the EU's capital markets union objective to improve SMEs' access to capital¹⁴.

Moreover, experiments with tokenised bank deposits are underway to assess innovative ways of transferring funds – using blockchain technology, for example – between clients of the same bank or group of banks.

DLT is also being explored as a possible means to improve crossborder payments. However, it is worth noting that these solutions are not always radically innovative, as the benefits associated with them can also be achieved in other ways.

For instance, the Eurosystem's TARGET Instant Payment Settlement (TIPS) service offers immediate payment settlement in central bank money 24/7, facilitates automated and conditional payments through application programming interfaces and is establishing itself as a useful platform for crossborder payments.

Potential DLT-based innovations are still at an early experimental stage. Nevertheless, central banks cannot afford to sit on the sidelines, as any widespread adoption of such innovations could jeopardise the anchoring role of central bank money in guaranteeing the efficiency and stability of our payment system.

Many explored DLT use cases involve transactions, notably in securities, currently settled between banks using central bank money. These include delivery-versus-payment settlement in both primary and secondary markets, along with recurring payments during the life cycle of securities, such as coupon payments.

Insofar as these applications lead to a proliferation of decentralised private money-based settlement systems, including stablecoins and tokenised deposits, they could lead to the refragmentation of wholesale payments. This in turn could impair central banks' ability to provide liquidity in periods of financial stress, elevating financial stability risks.

Eurosystem surveys show that this is not the desired outcome for market participants. They would generally prefer to continue settling in central bank money, or even to expand the range of central bank money settlement services available.

In fact, the absence of solutions enabling settlement in central bank money could impede innovation due to the credit risk associated with private settlement assets. Market players might shun promising new technologies if central bank money is unavailable as a settlement asset.

The availability of solutions for settling DLT-based wholesale financial transactions in central bank money could have the added benefit of facilitating the interoperability and integration of decentralised systems. It could also create opportunities to use central bank money to settle transactions currently settled in commercial bank money, such as over-the-counter derivatives, thereby reducing credit risk in the system.

The ECB's exploration of new technologies for wholesale central bank money settlement

The Eurosystem envisages two options for DLT-based infrastructures for settlement in central bank money. The first involves unified ledger solutions¹⁵.

In these solutions, euro central bank money and other assets, such as securities or foreign currency, would be recorded and settled on the same DLT platform. This could potentially be operated by the Eurosystem or jointly with other parties, subject to compliance with Eurosystem rules.

Although it may be easier to realise the envisaged benefits of new technologies if all assets and cash involved in transactions are on the same platform, reaching consensus on how to regulate and manage this is not without considerable challenges¹⁶.

This could take years given the difficult technical, legal, governance and business considerations, especially when multiple types of assets and jurisdictions are involved¹⁷. Moreover the implications of using DLT for the conduct of monetary policy need to be fully understood and possible risks duly assessed and mitigated.

Moreover, the move from existing systems to DLT platforms is likely to be gradual, as the market is still in the early stages of development and market players still need to make major technological decisions. This means there would be coexistence with legacy systems, whether operated by central banks or private stakeholders.

This situation calls for solutions that can adapt to rapid market innovation while still serving traditional use cases and enabling seamless interaction between old and new systems. By achieving sufficient harmonisation and interoperability, there is a good chance that the desired automation can be attained, even across different platforms.

The second option for DLT-based infrastructures for settlement in central bank money is thus based on interoperability-type solutions. Such solutions are likely to be faster to develop and less costly, and they do not prevent us from continuing to assess unified ledger solutions. The Eurosystem has for some time been looking at interoperable solutions and conducting exploratory work in cooperation with interested market participants.

These solutions could respond to immediate market demand and involve creating a link between market DLT platforms and central bank payment infrastructures. This link would, for example, enable securities or foreign currency transfer on a DLT platform to trigger settlement in euro central bank money, which may alternatively be provided in the form of DLT tokens, registered on a platform operated by the Eurosystem, or in central bank accounts in infrastructures based on existing technology.

Several interoperability-type solutions have been developed by national central banks within the Eurosystem, including the Deutsche Bundesbank's Trigger Solution, the TIPS Hash-Link solution developed by the Banca d'Italia and the Banque de France's Full DLT Interoperability solution.

The Eurosystem's exploratory work consists of experiments involving mock transactions and trials in a test environment in which a limited number of actual transactions will be settled. In December we published a call for expression of interest to participate in these experiments which will be conducted this year. The results will form the basis for the Eurosystem's future considerations about wholesale payment infrastructure.

The Eurosystem is not alone in exploring new technologies for wholesale financial transactions. Currently, up to 86 central banks around the world are exploring various ways to interact with DLT platforms¹⁸.

Crossborder projects coordinated by the Bank for International Settlements (BIS) and its innovation hubs are exploring how new technologies could potentially improve crossborder transactions.

Achieving a truly integrated market for wholesale transactions, whether DLT-based or not, requires collaborative efforts between public authorities, central banks and the market. In this respect, the European Union is at the forefront.

By adopting a pilot regime¹⁹ for DLT-based market infrastructures, European legislators have made it possible to experiment using real transactions. And by developing a solution for central bank money settlement of wholesale financial transactions recorded on DLT platforms, the Eurosystem is backing regulation with innovation. This has the potential to give Europe a competitive advantage in developing its industry base for DLT trading and in supporting the international role of the euro²⁰.

Stakeholders considering a move to DLT should ensure they do not trigger the recurrence of market fragmentation. This involves enabling interoperability between platforms, harmonising protocols or adopting a common data taxonomy. Agreeing on industry standards and implementing them across the ecosystem is crucial, not only for DLT-based transactions but also for settlements using existing technologies.

Conclusion

The rapid growth of digital technologies has sparked widespread market interest and experimentation. DLT-based technology is seen as promising, with the potential to increase efficiency for some existing transactions and to facilitate new use cases.

But we must be cautious that such innovations do not undermine the stabilising role of central bank money in settling transactions among financial institutions. Instead, central banks must be ready for the possible broad adoption of new technologies and keep pace with them as they have done in the past. This will help to combine innovation with financial stability, facilitating the modernisation of finance.

Achieving this requires public-private partnership to shape the future ecosystem for wholesale central bank money settlement. This collaboration should harness the benefits of new technologies while ensuring that settlement remains secure and efficient.

As we push the technology frontier, we must recognise that there are still many aspects that need to be understood in greater depth. The Eurosystem is playing its part by making central bank money solutions available for exploratory work. It is also conducting further analysis to develop its vision for the future wholesale financial transactions ecosystem.

However, it is ultimately the market's responsibility to demonstrate the added value of DLT for wholesale business cases, and to establish and implement the necessary standards. ■

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Endnotes

1. See Cipollone, P (2023), [“The digital euro: a digital form of cash”](#), ECB, 17 November; and Panetta, F. (2023), [“Shaping Europe’s digital future: the path towards a digital euro”](#), introductory statement at the Committee on Economic and Monetary Affairs of the European Parliament. See also ECB (2023), [“Digital euro: The next step in the advancement of our currency”](#), 18 October; and ECB (2023), [“A stocktake on the digital euro - Summary report on the investigation phase and outlook on the next phase”](#), 18 October.
2. Norman, B, Shaw, R and Speight, G (2011), [“The history of interbank settlement arrangements: exploring central banks’ role in the payment system”](#), Working Paper, No 412, Bank of England, June.
3. According to [this article](#), 97% of institutional investors believe it will revolutionise asset management.
4. Distributed ledger technology (DLT) refers to a family of technologies that allow users to modify records in a shared database (the ledger) without relying on a central validation system.
5. In other words, wholesale CBDC already exists. What is new is the exploration of solutions for central bank money settlement of wholesale financial transactions recorded on distributed ledger technology (DLT) platforms. See 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, Frankfurt am Main, 26 September.
6. See ECB (2023), [TARGET Annual Report 2022](#), June.
7. See Bank for International Settlements, (2012), “Principle 9: Money Settlements”, [Principles for financial market infrastructures](#), April. This principle foresees that “[a financial market infrastructure (FMI)] should conduct its money settlements in central bank money where practical and available.”
8. See European Securities and Markets Authority (2023), [Call for evidence – On shortening the settlement cycle](#), 5 October.
9. China has transitioned to T+0 for interbank market government bonds. India has already moved to T+1 for shares traded on exchange while the United States and Canada are planning to move to T+1 for a broader set of financial instruments by the end of May 2024. The United Kingdom is assessing a possible move to T+1 or T+0.

10. Both the US government and government agency debt markets as well as the UK government bond markets have been settling on a T+1 basis for a few years now.
11. See European Banking Authority (2023), *"Box 10: Digitalisation trends at banks"*, Risk Assessment Report of the European Banking Authority, December.
12. See ECB (2024) *"Central bank money settlement of wholesale transactions in the face of technological innovation"*, Economic Bulletin, Issue 8/2023.
13. smart contracts can be used to automatically check if a contract's terms and conditions have been met before executing the resulting action, eg. a transaction or a flow of information.
14. See Lagarde, C (2023), *"A Kantian shift for the capital markets union"*, speech at the European Banking Congress, Frankfurt am Main, 17 November; and Panetta, F (2023), *"Europe needs to think bigger to build its capital markets union"*, The ECB Blog, 30 August.
15. This would not imply one global ledger for all assets and use cases. There could be a multiplicity of individual unified ledgers, potentially connected to each other and to existing systems.
16. See Bank for International Settlements (2023), *"Blueprint for the future monetary system: improving the old, enabling the new"*, BIS Annual Economic Report, 20 June.
17. Consolidation on a common platform – or perhaps more realistically on a limited number of platforms – could be a long-term objective. However, this requires carefully assessing the implications of making central bank money available on a platform that may be jointly operated with others or may involve participants that do not currently have access to central bank infrastructures, new categories of market participants or participants in other jurisdictions. Before moving towards any common platform, assurance is needed that it can be implemented in such a way that central banks can continue to meet their objectives, not least as regards the conduct of monetary policy. For the Eurosystem, a key requirement would be the ability to control the central bank money we issue: any risk of external parties creating or destroying euro central bank money, or euro central bank money falling into the hands of anyone ineligible to hold it, must be avoided.

18. See Kosse, A and Mattei, I (2023), *"Making headway – Results of the 2022 BIS survey on central bank digital currencies and crypto"*, BIS Papers, No 136, Bank for International Settlements, July.

19. See Regulation (EU) 2022/858.

20. See also Panetta, F (2024), *"Beyond money: the euro's role in Europe's strategic future"*, address at the "Ten years with the euro" conference, Riga, 26 January.

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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

Taiwan'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.

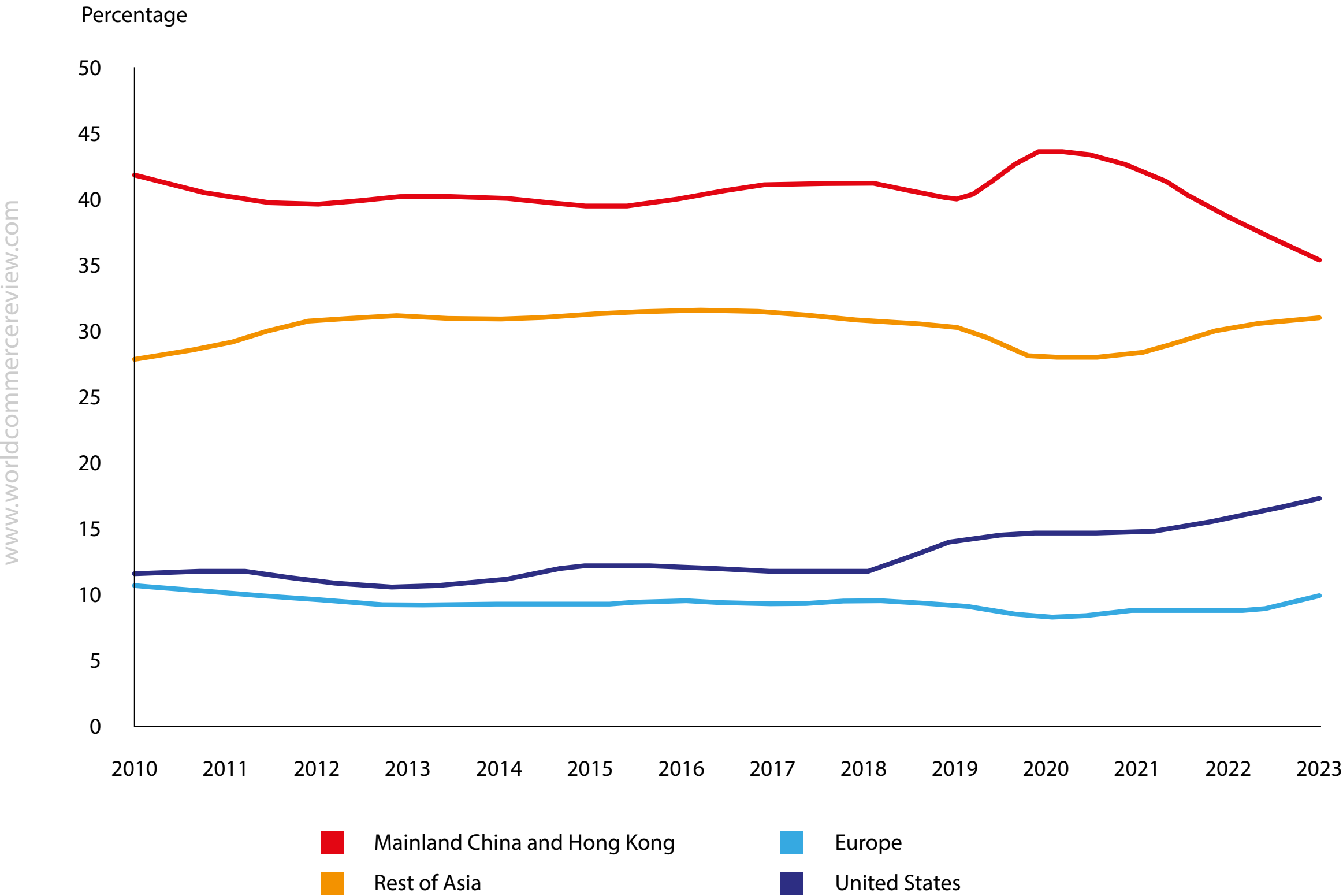
Taiwanese FDI into mainland China has also shrunk rapidly, from 65 percent of total Taiwanese FDI on average from 2008-2016 to 34 percent on average from 2017-2023 (Figure 2). The difference between these periods is that in the

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.

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 2014¹.

Second, with the DPP victory in 2016, the new Southbound Policy² was launched, offering incentives for Taiwanese companies investing in 18 Asian countries, including ASEAN³, 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.

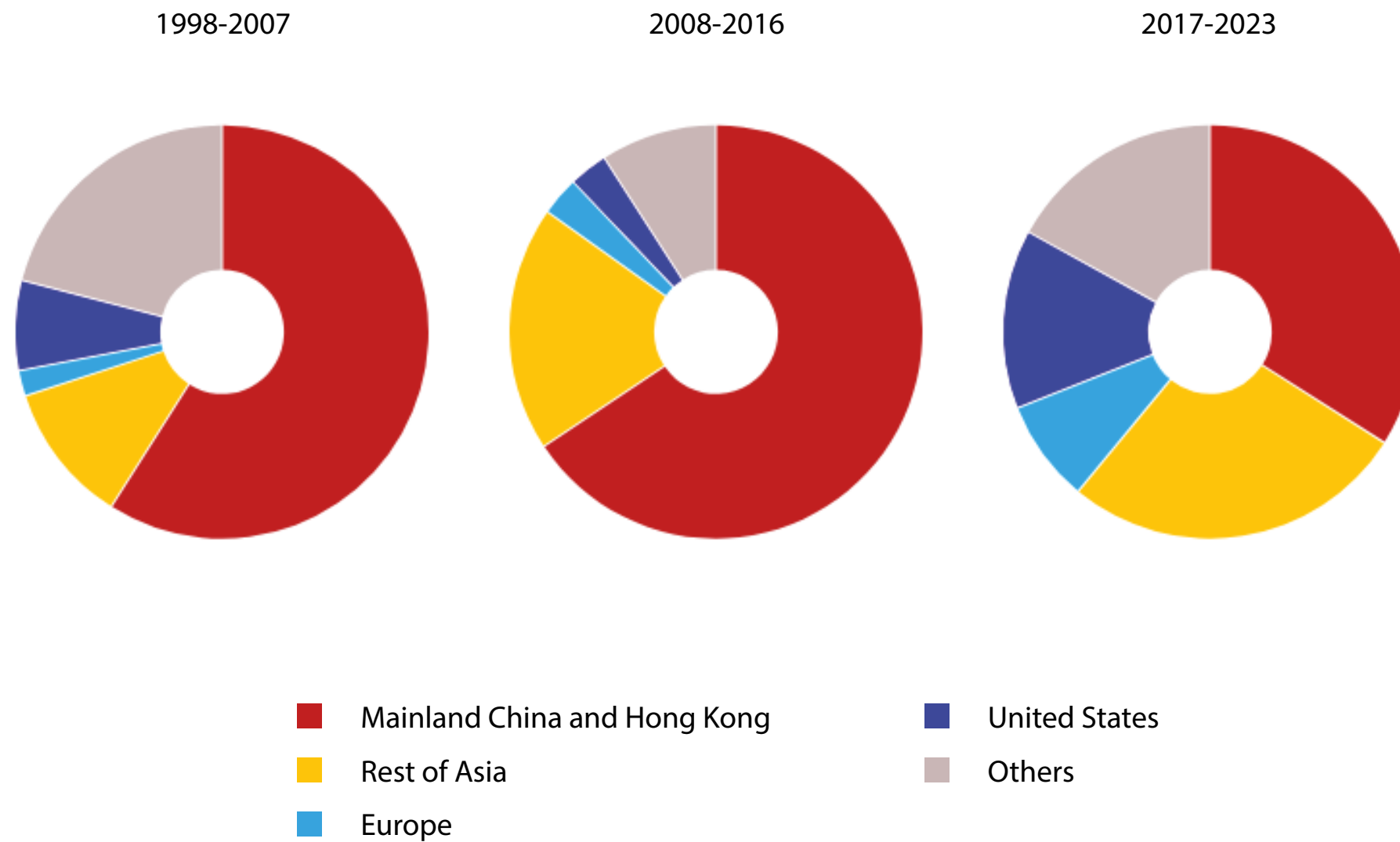
The new political reality and geographical diversification

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 China⁴. 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 CPTTP only a couple of days before Taiwan. Since then, the United Kingdom has become a member of CPTTP, 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 CPTTP because of lack of international recognition of it as a nation-state⁵.

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 factory⁶. TSMC announced in August 2023 a €4.5 billion investment in a semiconductor factory in Germany⁷.

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/>.
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Assessing China's efforts to increase self-reliance

Since 2018 China has pursued a clear, stated objective of self-reliance. Francois de Soyres and Dylan Moore investigate the extent to which China is making progress towards its goals

Since the beginning of 2018, the US and China have been increasing tariff rates on each other's imports, spurring debates about a possible fragmentation of trade into blocs of aligned countries (Alfaro and Chor 2023, Utar *et al* 2023, Pierce and Yu 2023).

Later that year, in a November 2018 speech, President Xi Jinping mentioned that current events were forcing China to *"travel the road of self-reliance."* This vow has been forcefully reaffirmed in a variety of public official communications. More recently, at the closing ceremony of the 2023 National People's Congress, Xi insisted that *"China should work to achieve greater self-reliance,"* referring to tensions with the US and other democracies.

In this column, we investigate the extent to which China is making progress towards self-reliance. We start by briefly reviewing China's growth model, which is based on strong investment to expand production capacity coupled with restrained domestic consumption.

Then, we show that the Chinese economy is gradually becoming less dependent on imports, with stark trends in key manufacturing and technology sectors. A particular focus on the automotive sector highlights the impressive pace at which China went from a net importer to a net exporter of finished cars, together with expanding its share of value added in production.

We conclude by discussing the recent sharp decrease in inward foreign direct investment (FDI) in China and the risk of a gradual decoupling of production between China and advanced economies.

China's growth model

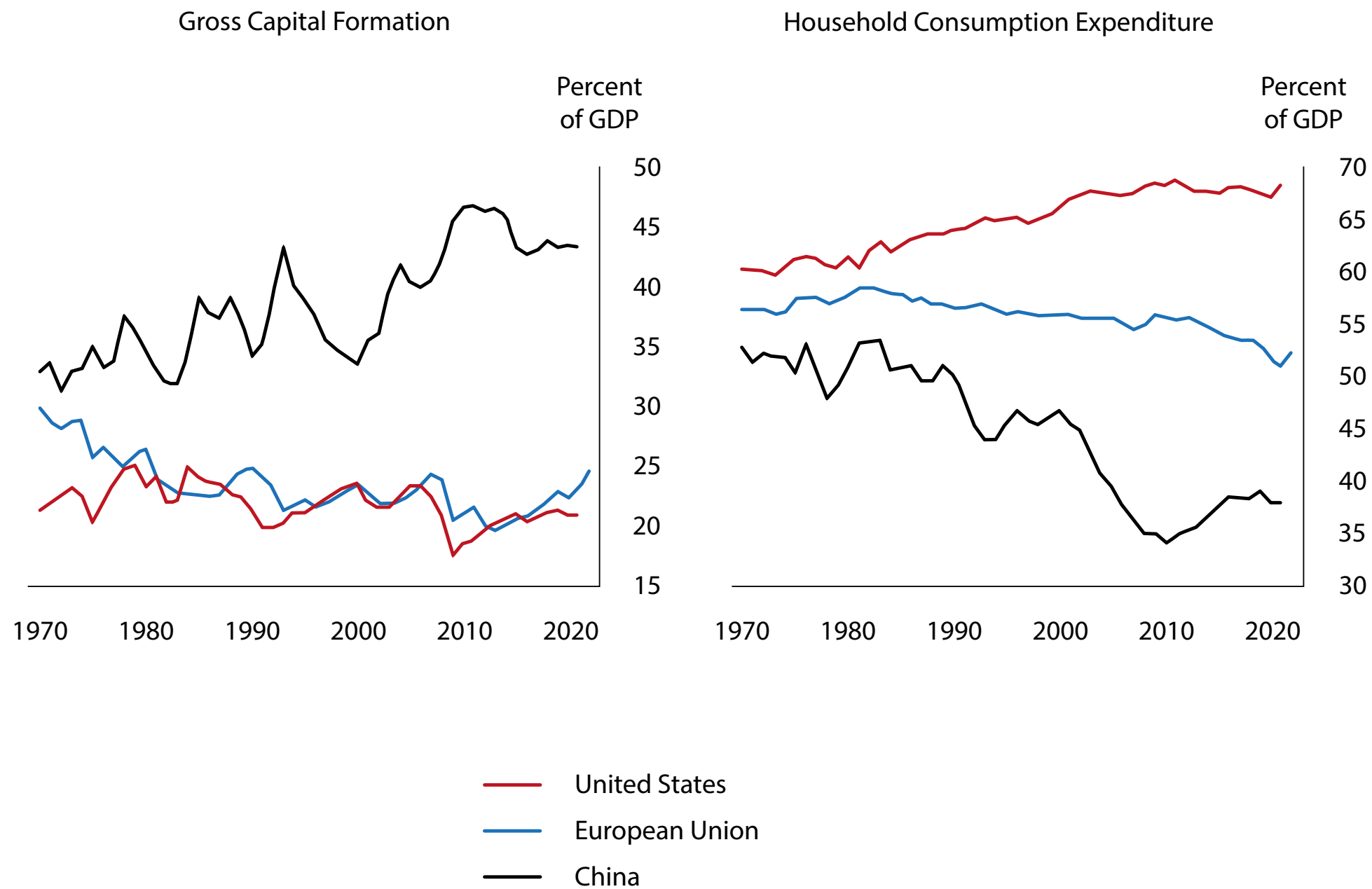
Over the past five decades, China's development model has been characterised by an increasingly high investment share of GDP (left panel, Figure 1) together with a strikingly low household consumption share of GDP (right panel, Figure 1).

As China expanded its production capacity, especially in manufacturing sectors, without a corresponding increase in domestic demand, its economy became dependent on foreign demand.

According to data from the International Monetary Fund, China's goods trade surplus reached an all-time high in 2022 of almost \$900 billion, illustrating how much China relies on foreign demand as an engine of growth.

China's declining reliance on imports, particularly in critical sectors like high tech and electrical products, demonstrates the progress that the country has made in just a few years

Figure 1. Composition of Chinese growth in China



*Note: The data extend through 2021 for China and the US and 2022 for the EU.
Source: The World Bank.*

While the export-dependency of the Chinese economy has been widely discussed (Bown 2022, Freund *et al* 2023, Hogan and Hufbauer 2023), Chinese authorities have been more worried about the country's import-dependency, observing that China needs access to a variety of inputs for its own production.

In 2018, President Xi Jinping called for a 'whole-nation approach' to reducing China's dependence on imports of critical technology components. His strategy includes increasing the country's investment in strategically critical technology sectors, strengthening domestic talent-grooming, and 'reshoring' expertise to spearhead innovation.

Decline of China's reliance on imports

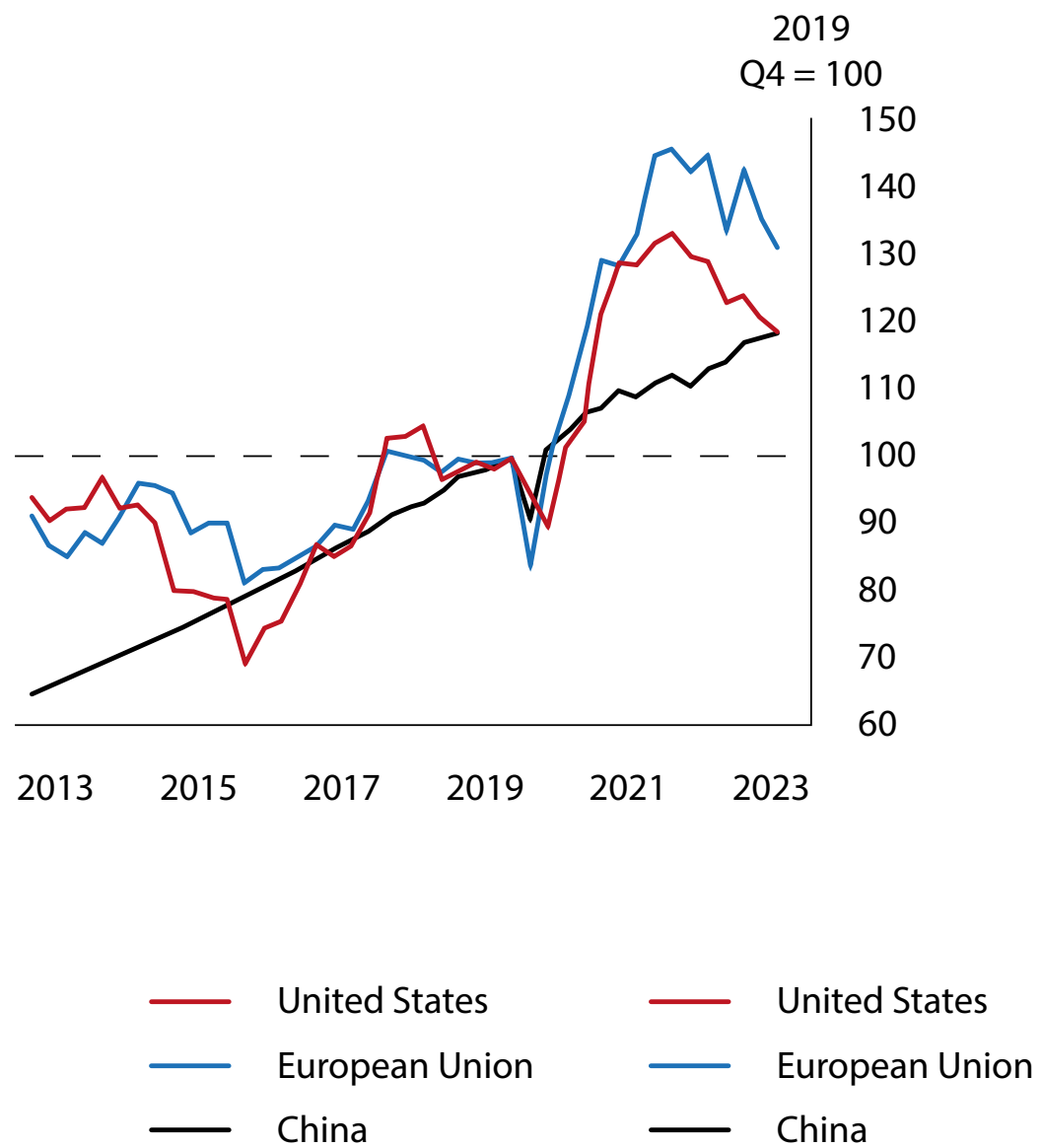
We start by looking at the joint evolution of GDP, imports, and exports. While imports and exports have historically been much more volatile than official GDP numbers, Figure 2 reveals another remarkable fact: over the past five years, import growth has been notably weaker than export growth.

Taking a closer look at the sectoral level, we note that the lukewarm Chinese imports are mostly driven by two sectors: (i) Mechanical & Electrical products and (ii) High-Tech products, which having been falling since early 2022 (Figure 3).

To investigate if the decrease in imports in these sectors could be driven by global forces, it is useful to look at the joint evolution of both imports and exports. Figure 4 reveals that imports and exports in these key sectors have decoupled since 2021, following a period in which the two measures moved closely together.

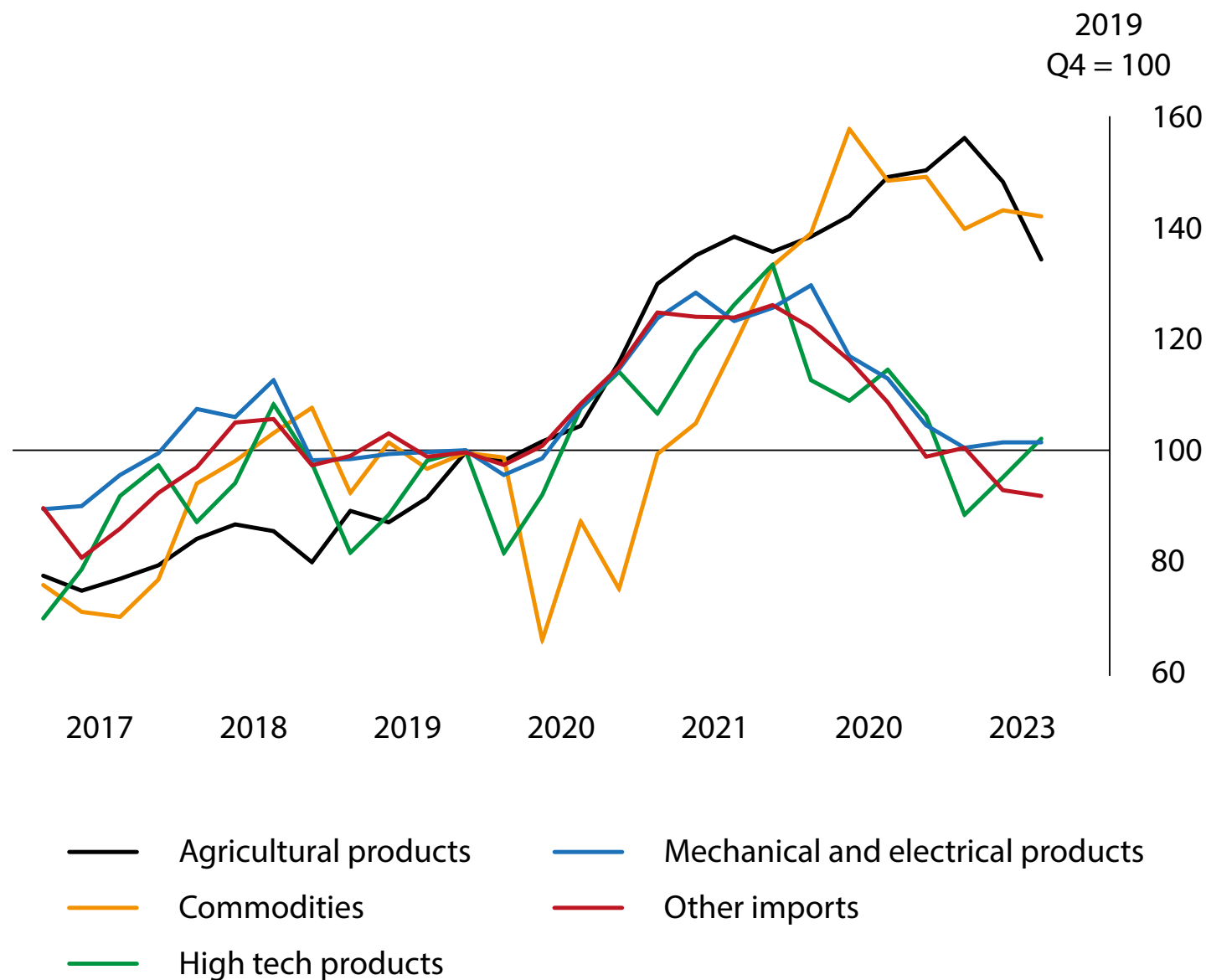
Mechanical and electrical product exports have been relatively flat, while imports have experienced a significant decline. Over the same period, high tech goods exports have declined, but imports have dropped further. The

Figure 2. Evolution of Chinese GDP versus trade



*Note: Series are seasonally adjusted.
Source: Haver Analytics; FRB staff calculations.*

Figure 3. Evolution of Chinese imports by sector



Note: Data are seasonally adjusted and end in 2023:Q3. Commodities includes coal and lignite, crude oil, refined petroleum products, fertilizers, steel or iron products, unwrought copper and copper, and unwrought aluminium and aluminium. Other imports includes beauty cosmetics and toiletries, plastics in primary forms, textile yarns, fabrics, and their products, and garments and clothing accessories. Share of total imports: 35% mechanical and electrical products, 23% high tech products, 18% commodities, 10% agricultural products, 3% other imports, 2% medicinal materials and pharmaceutical products (not shown).

Source: Haver Analytics.

overall decline in high-tech trade is likely partially attributable to trade and investment restrictions imposed by the US in this specific sector.

A focus on the automotive sector

The Chinese automotive sector provides insights into the processes underlying China's pursuit of self-reliance. China has received attention as the world's biggest producer of electric vehicles (EVs), and EVs are one of the many high-tech products the government is interested in supporting.

However, Chinese exports of all automobiles - including internal combustion engine (ICE) vehicles - have surged since 2020, greatly outpacing overall production and domestic sales due to several factors (Figure 5, left panel).

First, China can produce cheaper cars due to lower domestic prices for components like steel and electronics. Local governments have also been providing subsidies, particularly to electric vehicle companies, further pushing down prices in the sector.

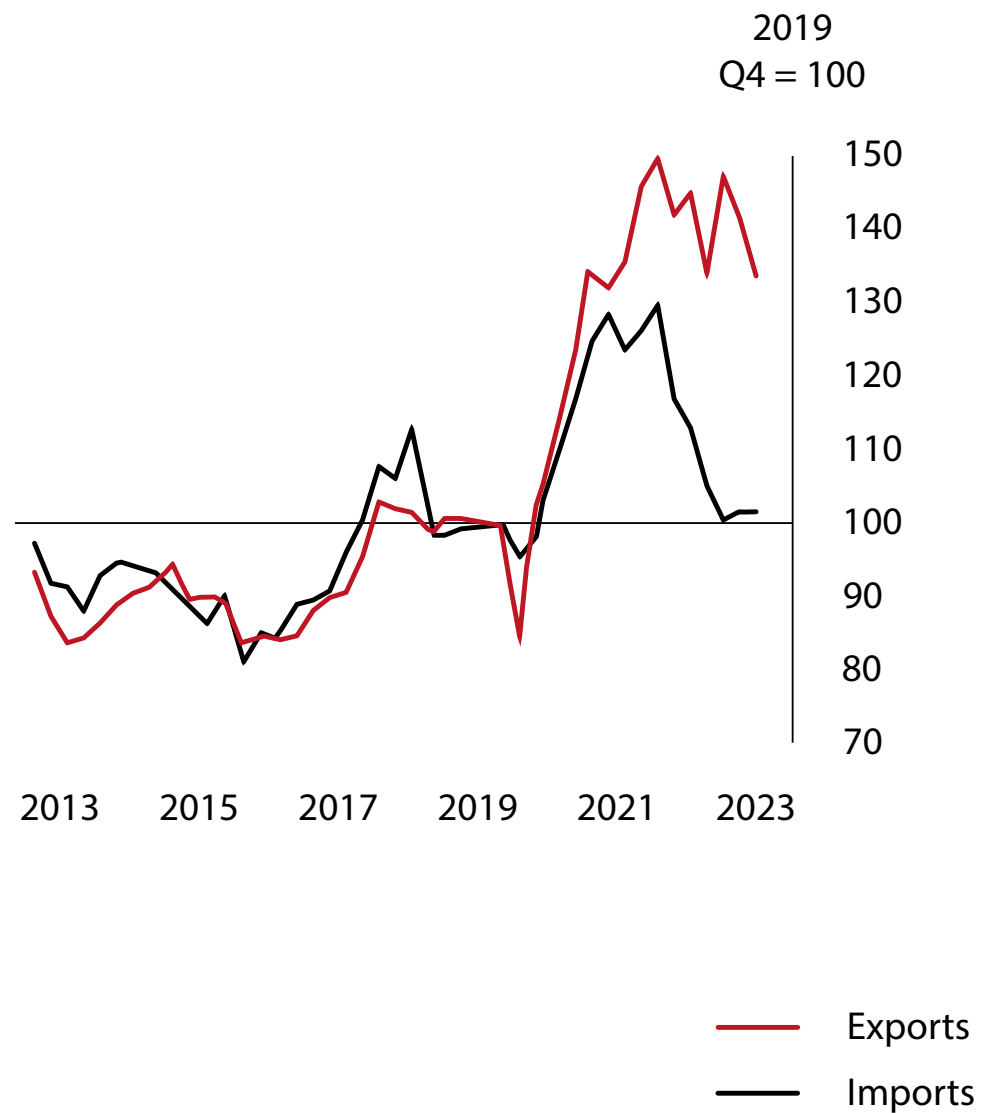
Second, Chinese domestic auto demand has shifted strongly towards electric vehicles (Figure 5, right panel), leaving China with a large production capacity for internal combustion engine cars at a time of diminishing domestic demand for these vehicles.

This has pushed China to export markets, where demand for internal combustion engine cars is not declining as rapidly, rather than closing these factories entirely.

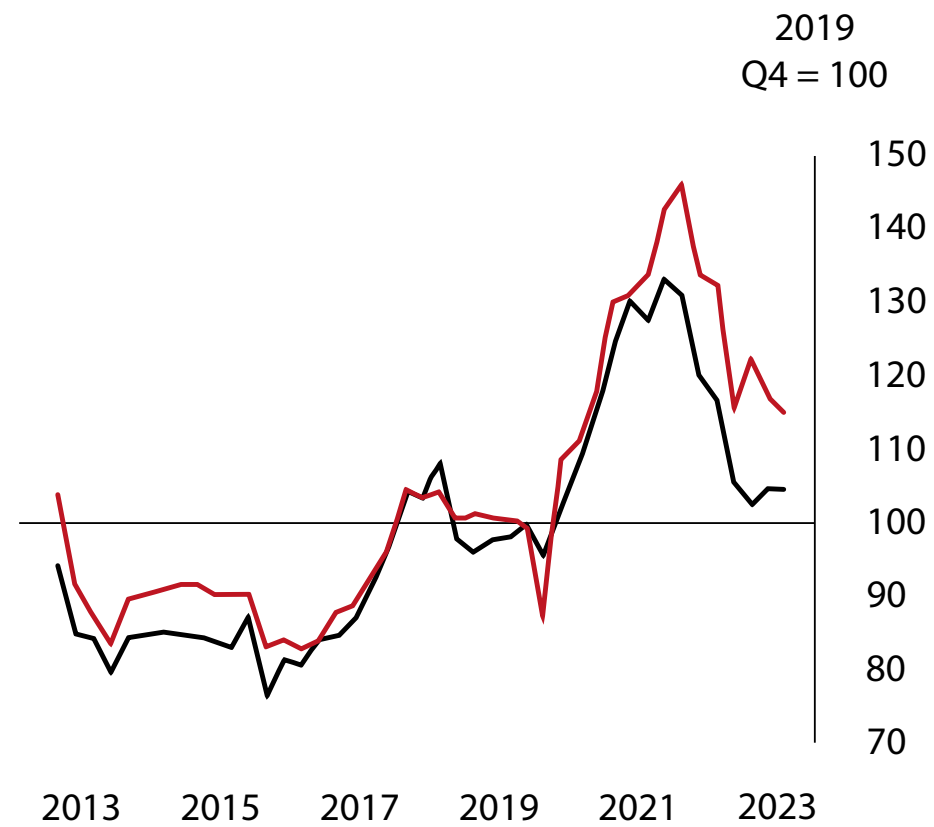
Moreover, Figure 6 (left panel) shows that China's trade balance has experienced an impressive shift. For finished vehicles, China went from a net importer to a net exporter over the past few years, while at the same time significantly increasing its net exports of auto parts.

Figure 4. Chinese trade balance by sector

Mechanical & Electrical Goods

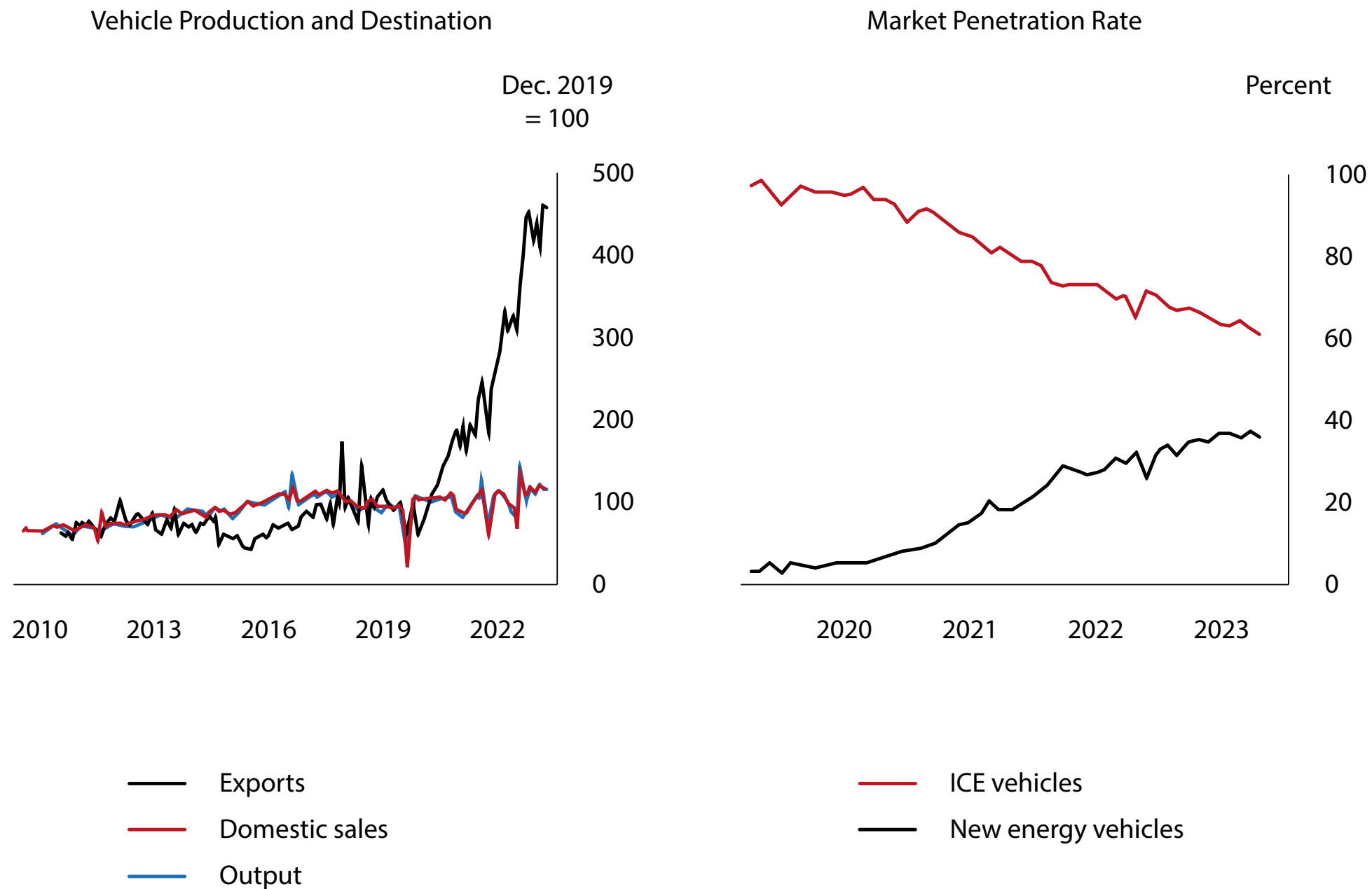


High Tech Goods



*Note: Data are seasonally adjusted and end in 2023:Q3.
Source: Haver Analytics.*

Figure 5. Shifting trends in the Chinese automotive industry



Note: New energy vehicles is the term used by the Chinese government for vehicles that are predominantly powered by electricity.
Source: Haver Analytics.

This supports the idea that China is not only gaining market shares in assembled vehicles but is also making progress towards comprehensive self-reliance.

Moreover, looking at gross flows reveals that the shift in the trade balance is the result of growth in exports but also a steep decline in imports, particularly auto parts (Figure 6, right panel).

Declining inward foreign direct investments

Declining foreign direct investment (FDI) into China may be affecting the country's decision to pursue self-reliance, and its urgency in meeting these goals. As shown in Figure 7, inward FDI in China turned negative in 2023:Q3 for the first time since the value began being recorded in 1998¹. By comparison, outward FDI has maintained a relatively flat level since 2017.

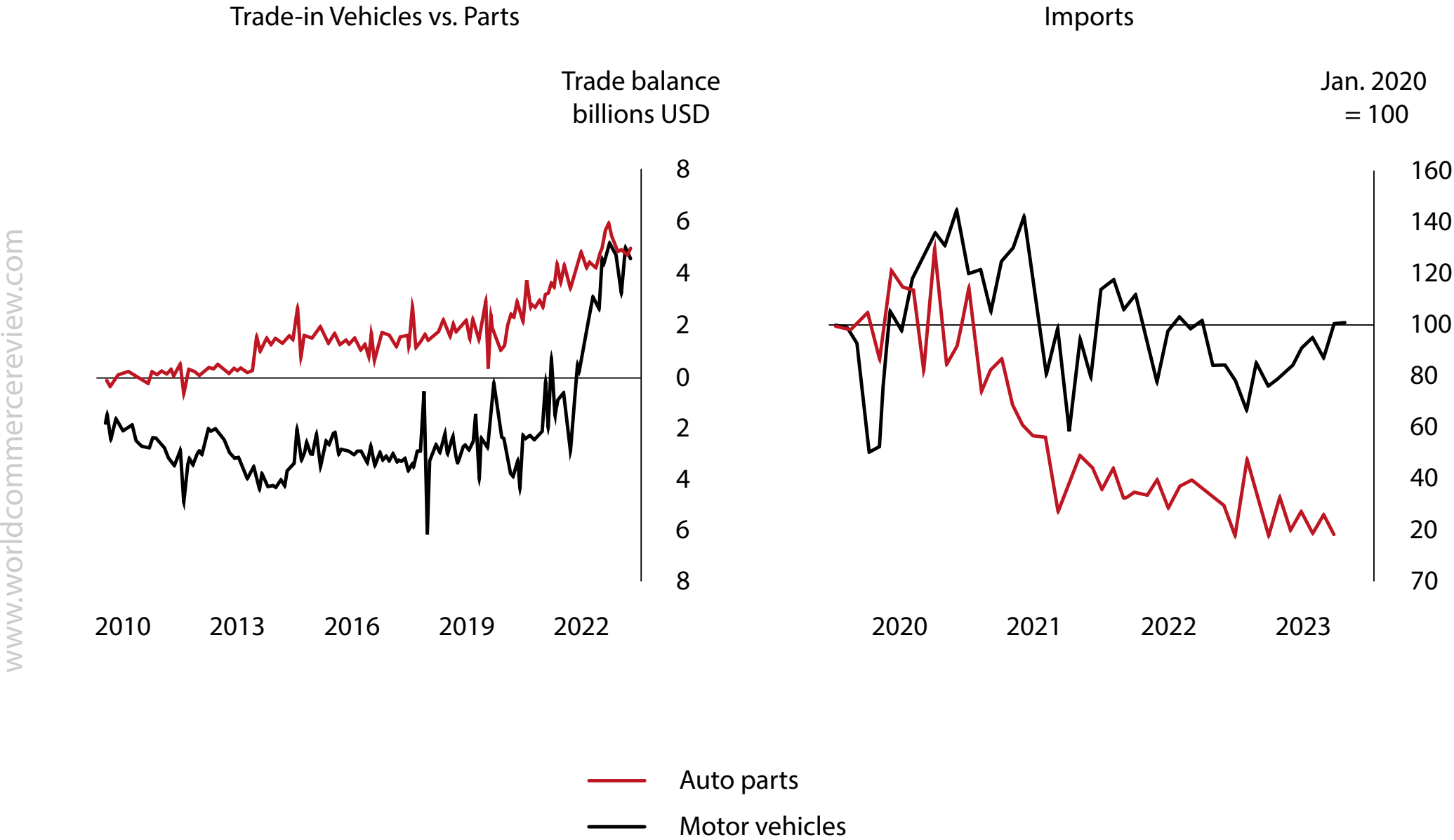
Some of this decline in inward FDI may be attributable to unique domestic factors in China, such as lower interest rates, a precarious real estate sector, and a crackdown on consulting firms through a counter-espionage law.

That said, on top of these economic forces, the rise in geopolitical risks and fear of sanctions is likely to have played an important role as well: tensions between the US and China have escalated over the past year, with the US even implementing a ban on high-tech investment in China in August.

As a result, global investors may have been directing part of their capital towards countries that are perceived as friendlier to the western bloc.

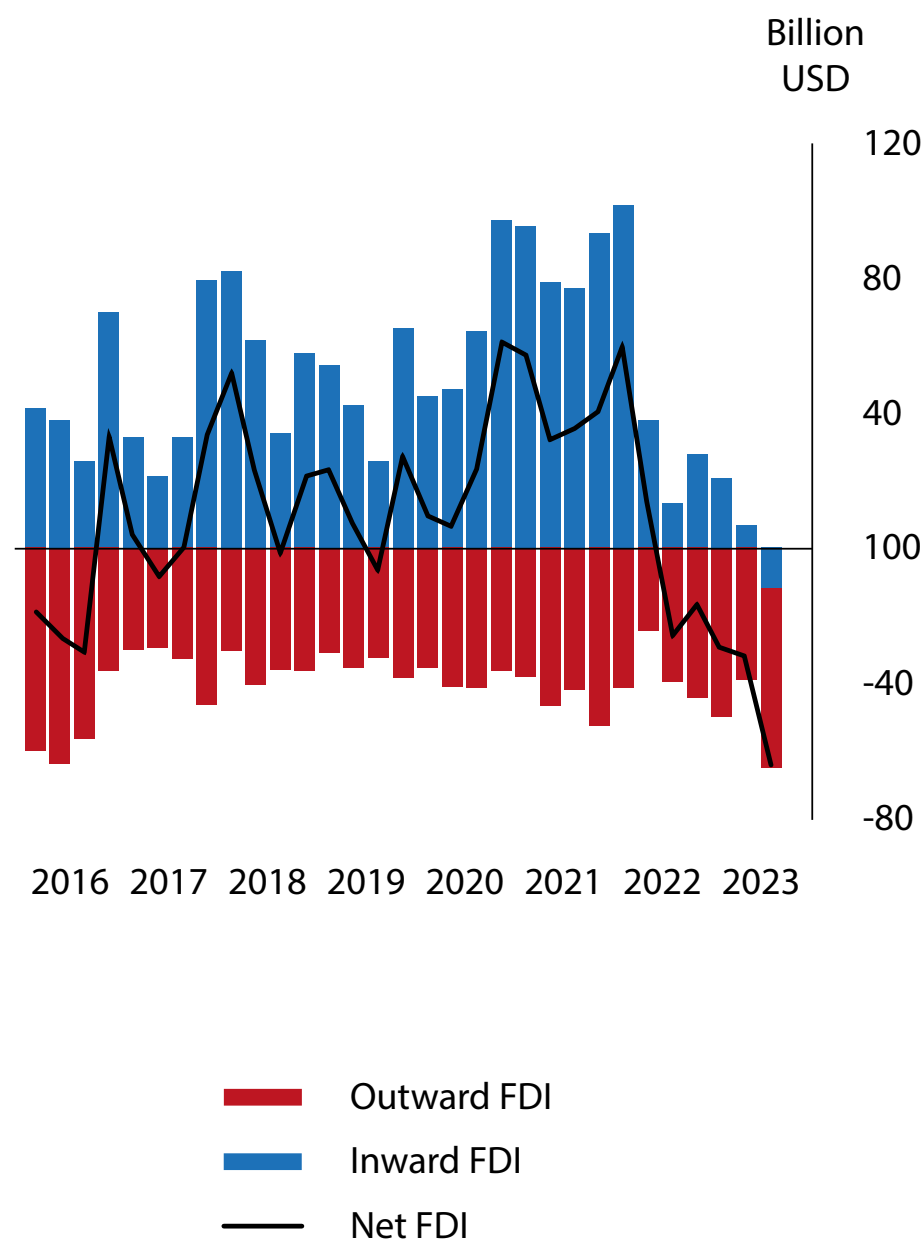
China's pursuit of self-reliance may be both a cause and a consequence of the sharp decline in inward FDI. China has implemented several policies in the name of national security that have made it more difficult for foreign firms

Figure 6. Evolution of trade in auto parts and motor vehicles



Source: Haver Analytics.

Figure 7. Foreign direct investment in China



Source: State Administration of Foreign Exchange (SAFE).

to succeed. At the same time, steep declines in investment could increase China's urgency in reducing its foreign dependence.

Concluding thoughts

Since 2018, China has pursued its clear, stated objective of self-reliance, and seems to have made progress in several key sectors. As geopolitical tensions rise, domestic and foreign restrictions on crossborder trade and investment have also intensified, potentially increasing China's urgency in pursuing its self-reliance goals.

China's declining reliance on imports, particularly in critical sectors like high tech and electrical products, demonstrates the progress that the country has made in just a few years.

At the same time, production linkages between China and the western bloc remain high. According to the OECD, China's contribution to foreign value added in world domestic final demand has grown significantly throughout the 2010s, reaching 39% in 2020.

A fragmentation of global production processes is not in sight, and China's pursuit of self-reliance is likely to continue having global ramifications. ■

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Endnote

1. A negative value for inward FDI means that foreigners are pulling money out of firms in China or selling off ownership stakes, or both.

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China's doom loop

Jose Caballero examines China's demographic trends and argues that a dramatically smaller (and older) population could create a devastating global slowdown

China has [announced](#) that in 2023 its [population declined](#) from 1.4118 to 1.4097 billion people. Forecasting by the UN suggests China's population will dip to 1.313 billion by 2050 and then down to about 800 million by 2100. This is a significant change and will have ramifications well beyond its borders.

There are two trends that underline such a demographic shift. First is the ageing population with the percentage of those aged 60 and older currently [above 20%](#) of the total population. Second, birth rates have [dropped significantly](#), from 17.86 million [births in 2016](#) to 9.02 million in 2023. Several interrelated economic consequences of such shifts could emerge which ultimately can affect China's economic wellbeing in the mid-to-long term and resonate globally.

More than one-quarter of China's population will be over 60 [by 2040](#) and so less economically active ([retirement age](#) for men is 60 and for women it's 50-55). This will put pressure on China's pension and elderly care systems with some predictions indicating that the pension system could be bankrupted by 2035.

To avoid pension-related issues straining public resources, [possible scenarios](#) include raising the retirement age to get people to work for longer, increasing taxes to cover additional pension requirements and shrinking current benefits.

Changes in the healthcare system to cope with population changes could leave the many people feeling less well off or unhappy with services being reduced. This in turn could result in some degree of political instability.

In addition, as the dependency of the elderly on their children increases, [household consumption](#), savings and investment levels are likely to decline, which in turns negatively affects the overall health of the economy.

Labour force reductions

As older workers retire, there will be fewer people of **working age** in the total population, and therefore available to work. Taking measures to help older people continue to work for longer, for example, could become fundamental to long-term economic growth and to sustain the levels of GDP per capita. Nevertheless, as pointed out above, such measures could be politically unpopular.

China's economic growth depends on productivity and employment growth. Economic growth is driven by the effective combination of labour and capital (money) to generate services or products

Productivity gains (GDP per employed person) may also be affected by a reduced workforce, and one which is getting older. Some studies find evidence that labour productivity (output per working hour) varies with age. It tends to increase as a person enters the labour market, then plateaus between 30 and 40, and eventually declines as an individual's work life comes to an end.

Population shifts can lead to a 'doom loop', where one economic situation creates a negative impact and then another and another. As lower productivity begins to affect production in particular sectors, China may be compelled to increase imports to satisfy demand in those industries.

This could significantly affect innovation and entrepreneurship which in turn can further diminish productivity. New ideas, drive economic growth. The size of the workforce affects innovation because as the number of employed individuals shrinks, the pool of new ideas becomes narrower.

If population growth becomes negative or falls to zero, then the knowledge behind those ideas stagnates. In addition, there is evidence that the peak of a person's innovative activities and scientific output comes at around 30 and 40 years of age.

Current demographic trends are therefore likely to stifle technological advances and innovation in China. Innovation is essential to sustain and improve living standards, consequently the levels of quality of life may come under strain as the population reduces.

At the same time, studies suggest that entrepreneurship can be negatively affected by the ageing of the population as the percentage of young people is positively linked to entrepreneurial activities. This hampers the dynamism of the economy and contributes to slower economic growth.

China's **economic growth** depends on productivity and employment growth. Economic growth is driven by the **effective combination** of labour and capital (money) to generate services or products.

This requires a constant or increasing **population size**. Importantly, with its **population going down**, China would need to increase its per capita productivity so as to sustain economic growth.

As we have seen, Chinese productivity is also likely to go down as a result of the demographic changes. Therefore, it is expected that the Chinese economy will experience a slower economic growth through, for example, the shrinking of the numbers of shoppers or consumers which will directly impact the retail trade sector.

In addition, lower demand is likely to intensify the ongoing crisis in the **property sector**. Fewer people able to buy property will mean a fall in prices.

And prices go up outside China

China is the second largest market in the world responsible for over **one-third** of the world's growth and the **second largest importer**, so any changes will have global repercussions.

In Brazil and South Africa, for instance, both significant trading partners with China, these population shifts may lead to a **lower demand** for their exports. This may result in **lower employment** levels in those countries as exporting companies are forced to reduce operations.

As productivity declines in China, its trading partners may be compelled to import products from other economies which in turn can increase the prices of their products. In addition, emerging economies such as Thailand and Vietnam that rely on Chinese **outbound tourism** will experience a significant downturn in all tourism-related sectors

such as transport and hospitality as the effect of population shifts lowers the number of people able to travel overseas.

Multinational corporations will also feel **demand drop** as the Chinese consumer market is a large source of their revenue. The knock-on effect is likely to be global as suppliers and workers around the world find jobs disappearing. In short, as a recent **OECD report** puts it, a sharp economic slowdown in China would drag down global growth, the effects of which could be devastating. ■

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This article first appeared in [The Conversation](#).

Relationship stickiness in international trade

Supply chains are vulnerable to disruptions. Julien Martin, Isabelle Mejean and Mathieu Parenti introduce a new measure of 'relationship stickiness' which quantifies these vulnerabilities

Global supply chains have become a significant concern for policymakers worldwide, especially in light of the supply chain pressures arising from the COVID-19 pandemic and escalating geopolitical tensions (Baldwin *et al* 2023). The vulnerability of supply chains to disruptions related to trade, such as tariff wars, natural disasters, pandemics, wars, or other unforeseen events, is closely tied to the dynamics of firm-to-firm trade relationships within the supply chain.

Specifically, a firm's vulnerability tends to be more pronounced when it is entrenched in trade relationships (Antras and Chor 2013). Locked-in effects limit a firm's capacity to adapt to shocks by switching suppliers, which is a crucial aspect of shock mitigation in conventional trade models. The degree of such stickiness thus determines the cost of shocks, which influences the opportunity to adopt de-risking strategies (Baldwin and Freeman 2022).

Several factors contribute to locked-in situations, including the challenges of identifying alternative suppliers, the existence of long-term contracts, and investments specific to the relationship (Antras and Helpman 2004). In a recent paper (Martin *et al* 2023), we consolidate these elements under the term 'relationship stickiness'. While this concept is essential for describing the nature of trade ties, the existing trade toolkit lacks a well-defined measure of relationship stickiness.

A new measure of trade relationship stickiness

The question then arises: how can we measure and quantify relationship stickiness? Our hypothesis is that relationship stickiness predominantly varies *across* different product categories.

For instance, we anticipate minimal stickiness for commodities traded on spot markets but expect higher stickiness for products requiring extensive customisation for each client, such as car doors. Based on this premise, we develop

a measure of product stickiness at the 6-digit Harmonized System (HS) level, which can be merged with widely available trade datasets.

We begin with a simple intuition: in sticky product categories, firms cannot easily switch from one supplier to another. Therefore, the *duration* of trade relationships becomes a valuable indicator of stickiness. Of course, relationships may last longer for reasons that are orthogonal to product-market characteristics, eg. because of a good match between the firm and its supplier.

Stickiness is anticipated to influence the resilience of international trade ties, the adjustments of trade flows, and the scope and design of de-risking strategies

We incorporate these considerations into a theoretical framework, enabling us to map the duration of firm-to-firm relationships to an indicator of relationship stickiness. Subsequently, we leverage detailed firm-to-firm data on French bilateral trade to estimate relationship stickiness.

We end up with a measure of stickiness for 5,000 HS6 product categories. A natural question is whether our measure correlates with established characteristics of product markets commonly used in the trade literature. The short answer is affirmative, but none of these measures, even when combined, explains a significant fraction of the estimated dispersion. More specifically:

- Product-level characteristics used in the literature, such as product differentiation, upstreamness, and product complexity, all correlate with our measure in the expected way. However, they jointly explain around 10% of the dispersion in stickiness. This implies that our measure captures dimensions of heterogeneity that are not encompassed by other variables.
- Our measure also correlates with proxies for search frictions and market thickness as well as measures of technological specificity. Market and technological determinants respectively explain about 12% and 14% of the dispersion in relationship stickiness.
- Stickiness explains 10% of the dispersion in the share of intra-firm trade in the US across industries. Note that causality operates bidirectionally here: firms might opt for integration with the producers of their most sticky inputs, yet vertical integration also generates mechanical stickiness in firm-to-firm relationships.

Stickiness with gravity

A nice feature of the measure is that it can be easily merged with widely used trade datasets, to revisit standard empirical facts. We analyse the interplay between distance and relationship stickiness in a gravity equation

estimated on product-level multilateral data. Our estimates confirm the adverse effect of distance on the magnitude of trade.

Figure 1 further shows that the distance elasticity is magnified in stickier product markets. A possible interpretation is that the impact of distance is in part a consequence of trade involving monitoring costs, which are i) larger in stickier markets, and ii) increasing in distance (Head and Ries 2008).

Stickiness and the heterogenous impact of uncertainty shocks

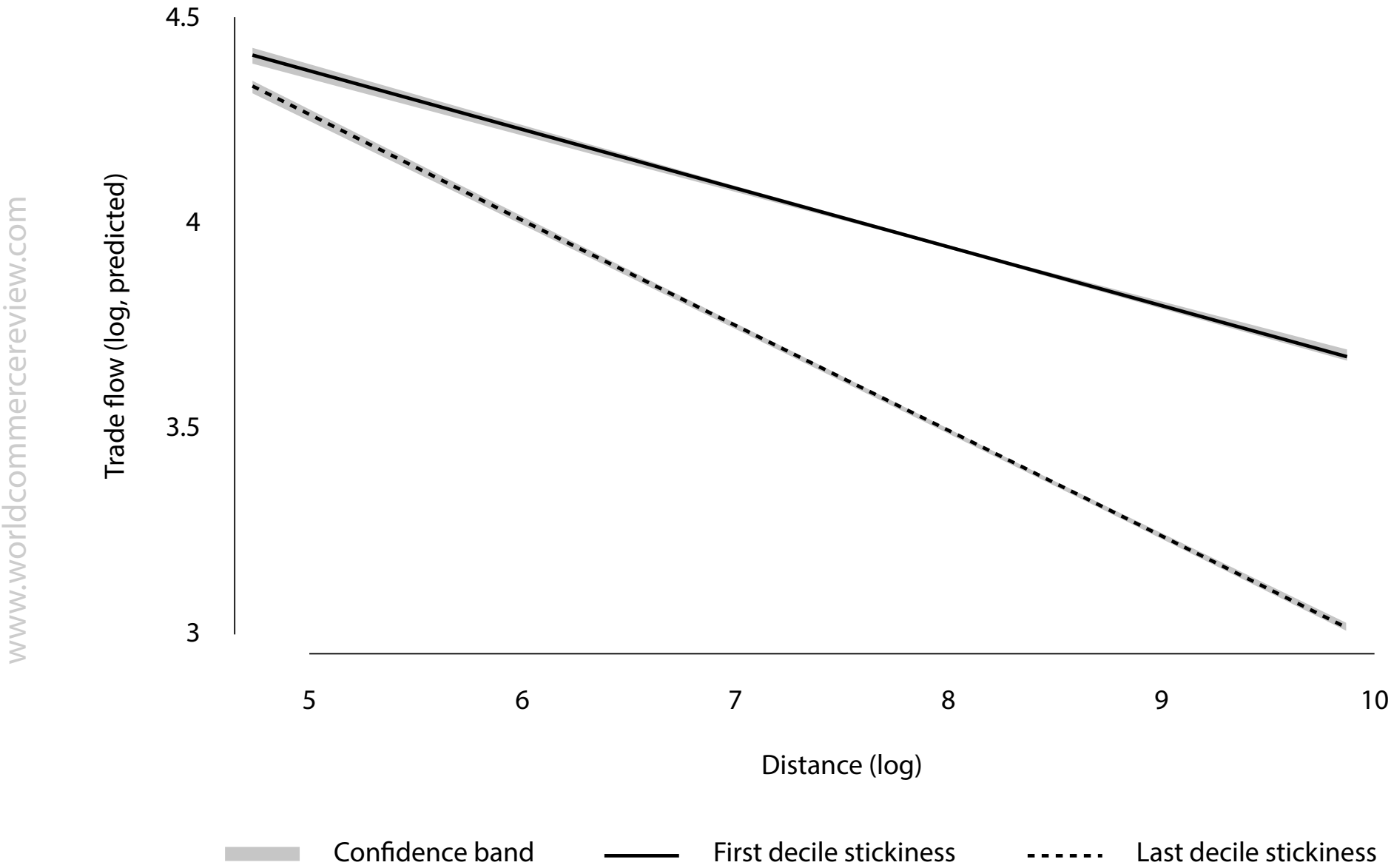
In our paper, we then explore how relationship stickiness shapes the adjustment of trade flows to macroeconomic shocks. Our focus is on uncertainty shocks, and we estimate the extensive margin response of French exports to an increase in uncertainty in the destination country.

The results of this analysis are summarised in Figure 2. The figure shows that high uncertainty episodes are associated with a significant reduction in the number of new firm-to-firm relationships, aligning with the intuitive notion that uncertainty discourages firms from engaging in new economic activities.

Importantly, the extensive margin response is stronger in sticky product categories compared to less sticky ones: in high-uncertainty episodes the number of new firm-to-firm relationships drops by 1.5% for products in the bottom quartile of the distribution of relationship stickiness versus 10% for products in the top quartile.

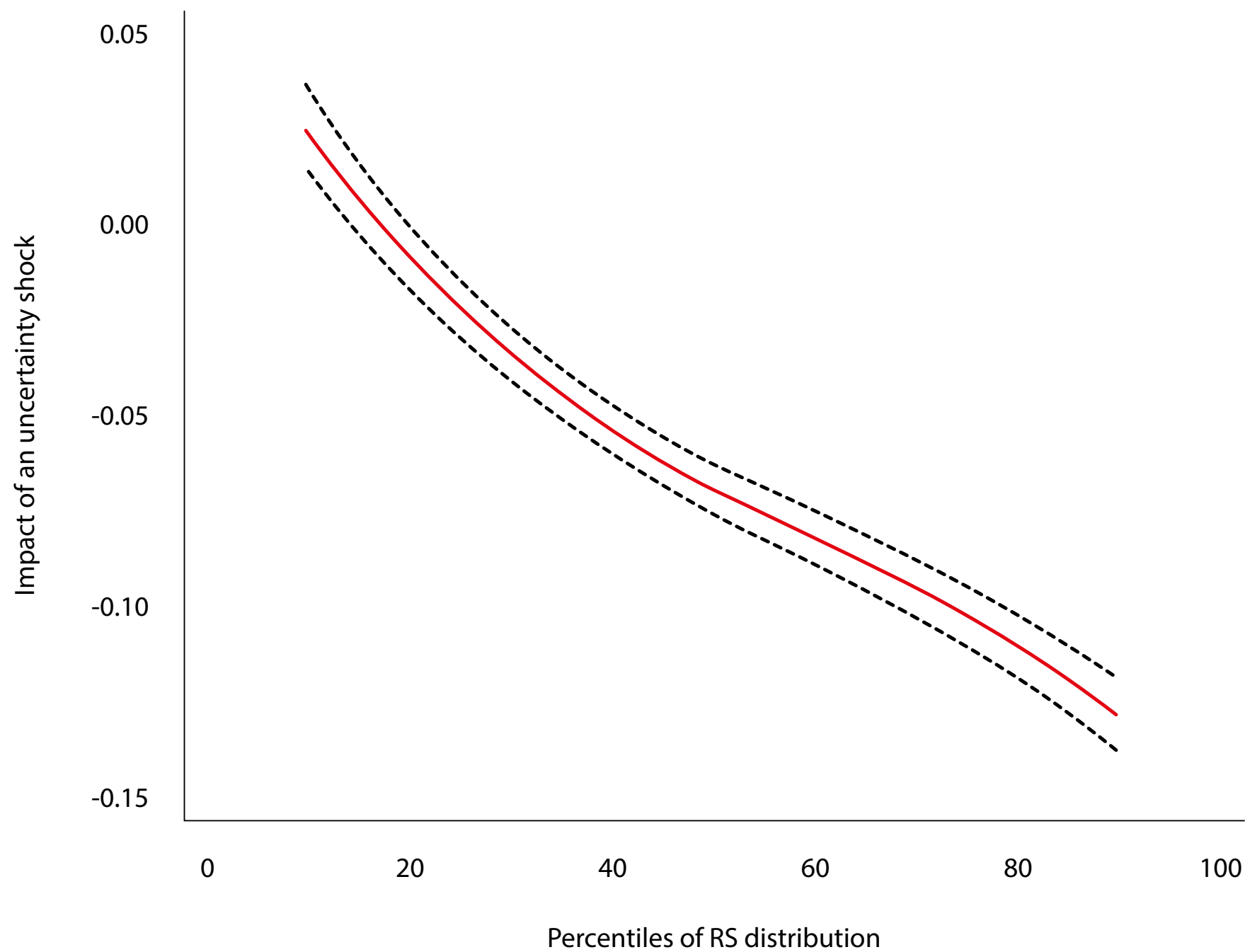
The paper further analyses firms' disruption of relationships and the intensive and extensive adjustment along the distribution of stickiness. All our findings consistently support the notion that trade adjustments are intricately shaped by the degree of relationship stickiness in product markets.

Figure 1. Predicted impact of distance on trade flows for products in the top decile vs. bottom decile of the distribution of our index



Note: Prediction based on Martin et al (2023); Column 4 Table OA.8.

Figure 2. Impact of an uncertainty shock on new relationships along the distribution of stickiness



*Note: Percentage-point impact of an uncertainty shock on the number of new relationships.
Source: Martin et al (2023).*

Stickiness during the COVID crisis

While in Martin *et al* (2023) we focus on uncertainty episodes, delving into the microeconomic underpinning of other crisis episodes can enhance our understanding of dynamic trade patterns. Figure 3 thus digs into the trade collapse around the COVID crisis.

The figure contrasts the evolution of French imports between high-stickiness and low-stickiness products at the end of 2019 and in 2020. It appears that product markets with a higher degree of stickiness experienced a milder impact from the trade collapse in March and April 2020.

This observation is largely attributed to the fact that the trade downturn was more pronounced in less sticky product markets. Further analysis reveals that the bulk of this has been driven by the extensive margin, ie. a drop in the number of bilateral import flows within a firm.

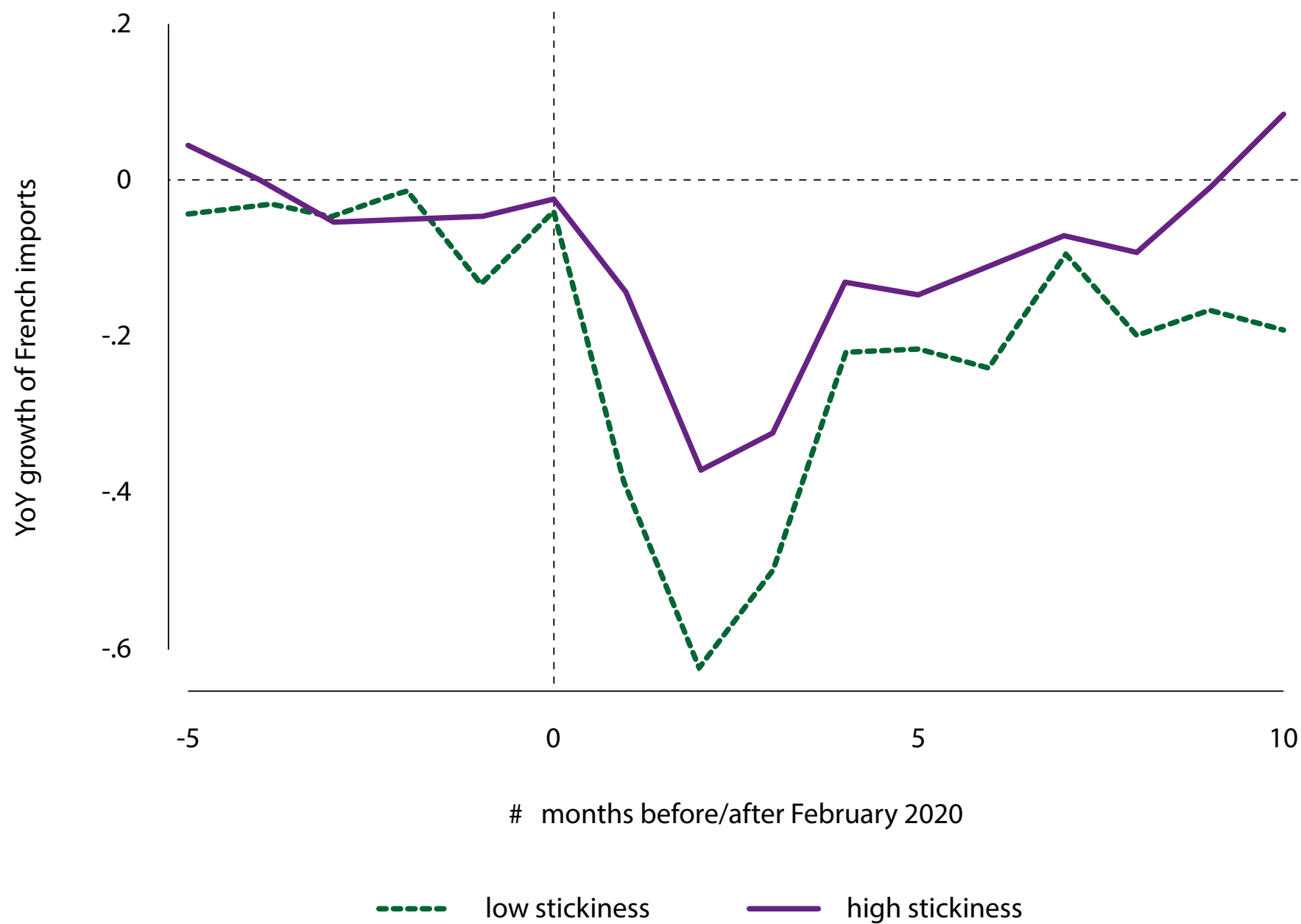
Whereas such descriptive evidence is by no means indicative of the specific mechanism behind this pattern, it illustrates how our index can be used to shed light on unexplored facets of trade flows.

Using relationship stickiness to refine the measures of trade dependencies

In a recent paper, Mejean and Rousseaux (2023) finally used the relationship stickiness index to identify trade dependencies exposing the EU to potential disruptions. The literature has proposed various heuristic measures to assess vulnerability associated with trade.

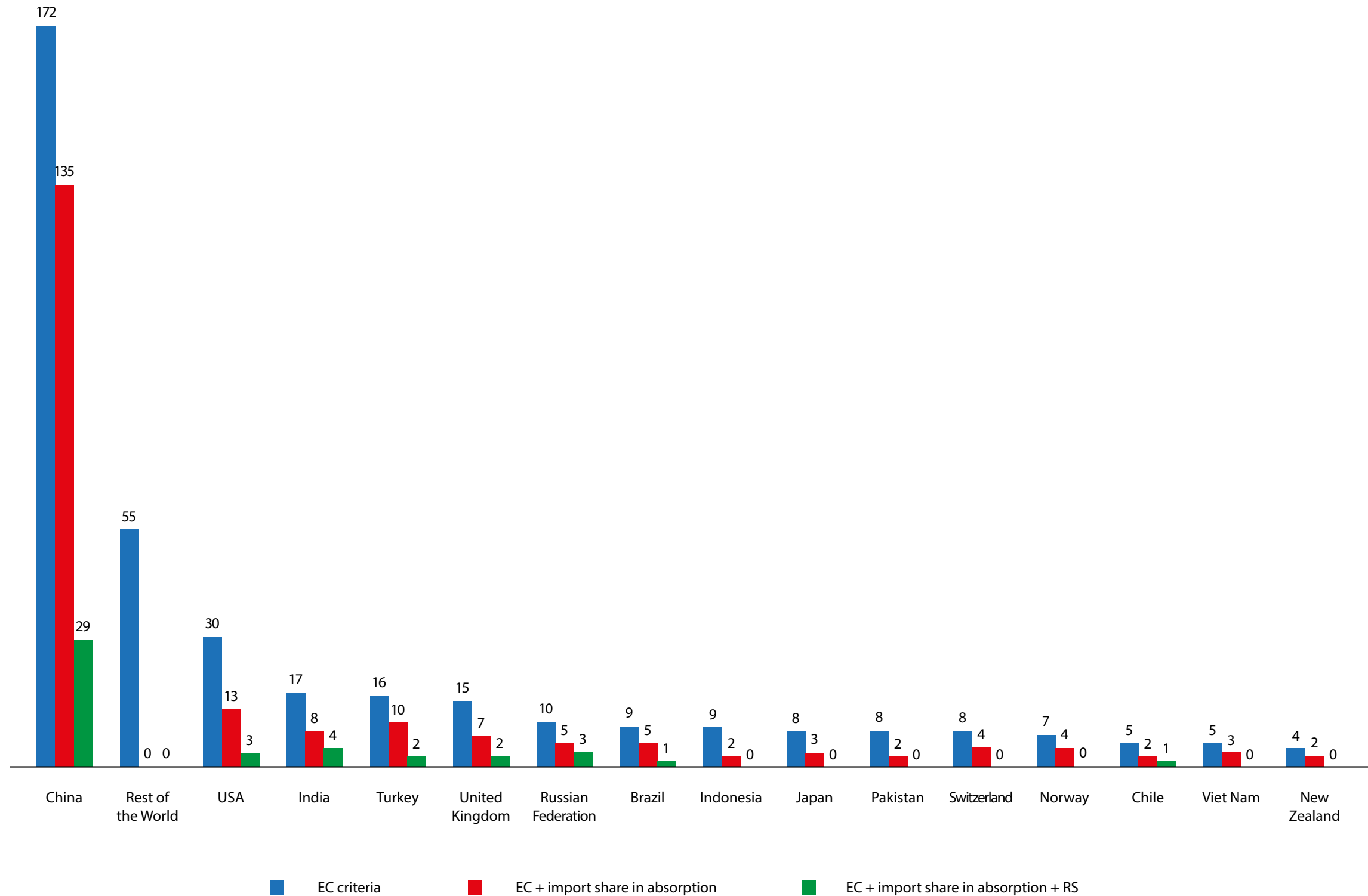
The European Commission (2021) thus identifies trade dependencies by the structure of global trade. Products imported from a limited number of producing countries are considered more vulnerable to trade shocks, especially

Figure 3. Year-on-year growth of French imports



*Note: Sticky products are products in the top quartile of the distribution of our index. The least sticky products are in the bottom quartile.
Source: Martin et al (2023).*

Figure 4. Comparison of the geographical distribution of three lists of strategic dependencies



Note: The figure illustrates the geographical distribution of identified strategic dependencies, using the European Commission methodology (blue bars), the strategy augmented with an absorption criterion (red bars) and the list that further incorporates the stickiness indicator (green bars).

Source: Mejean and Rousseaux (2023).

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when domestic absorption heavily relies on foreign producers. Applying these criteria to the EU context, the authors identify 228 products as potentially vulnerable to shocks.

Relationship stickiness can be used to refine the diagnosis of vulnerability. Traditional criteria used in the literature focus on the ex-ante structure of trade and production, which may offer limited diversification opportunities when concentrated on a small number of producing countries.

The degree of relationship stickiness serves as a complementary indicator regarding the possibility of ex-post diversification. Trade disruptions in concentrated product markets are likely to be particularly costly if the product *also* displays a high degree of stickiness. Adding this criterion restricts the list to 48 vulnerable products. As shown in Figure 4, a disproportionate share of these products is sourced from China.

Conclusion

The literature on global value chains has consistently highlighted multiple contractual frictions that contribute to a significant level of stickiness in trade partnerships. This stickiness is anticipated to influence the resilience of international trade ties, the adjustments of trade flows, and the scope and design of de-risking strategies. Consequently, it is crucial to measure relationship stickiness in trade data. We propose such a measure that is available on our websites. ■

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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 gigawatts¹ 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 today².

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 China³, 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 by⁴.

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 (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).

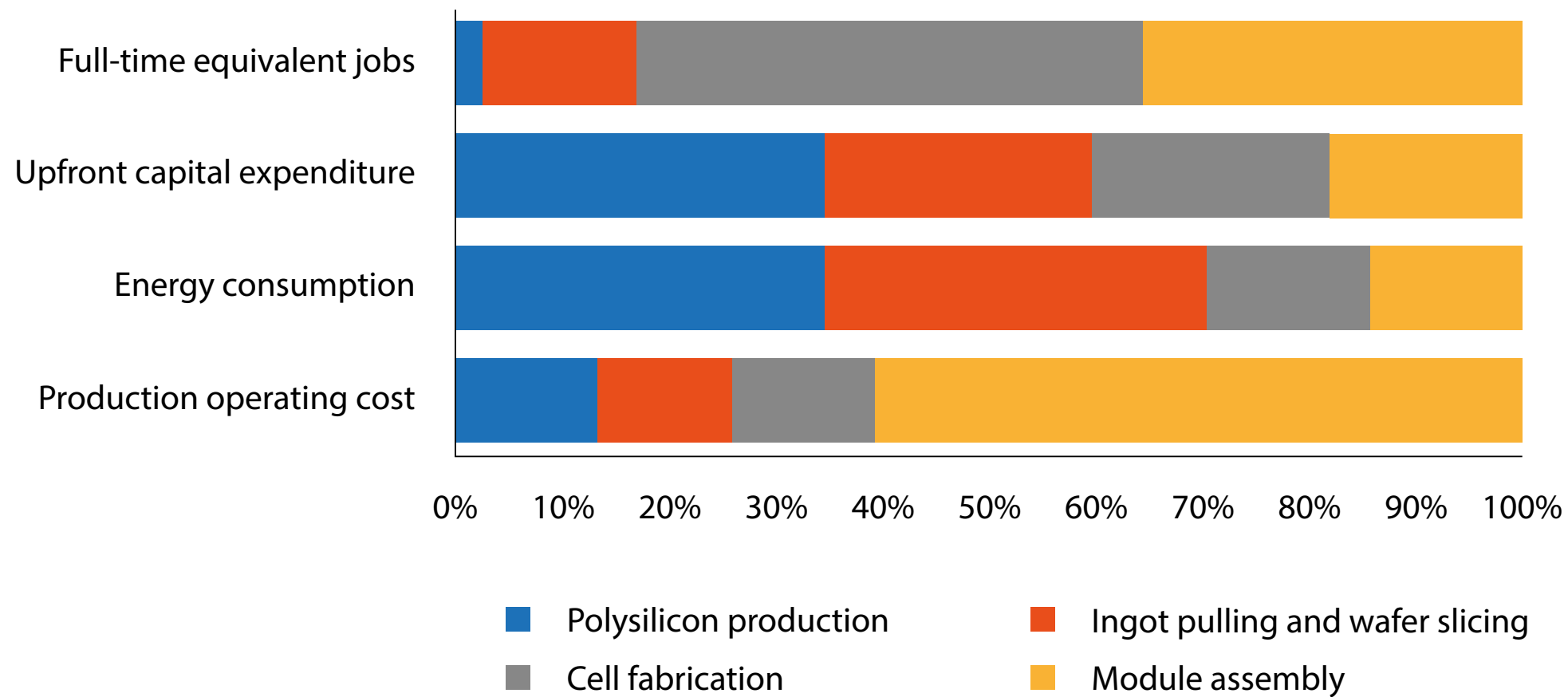
Wafers are then processed to produce cells in a highly automated system. Finally, cells are assembled into modules and sandwiched with other components including glass and aluminium frames. Along this value chain, the earlier stages are capital- and energy-intensive, while later stages account for the 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 capacity⁶.

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 factories⁵, 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 chain⁷. 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).

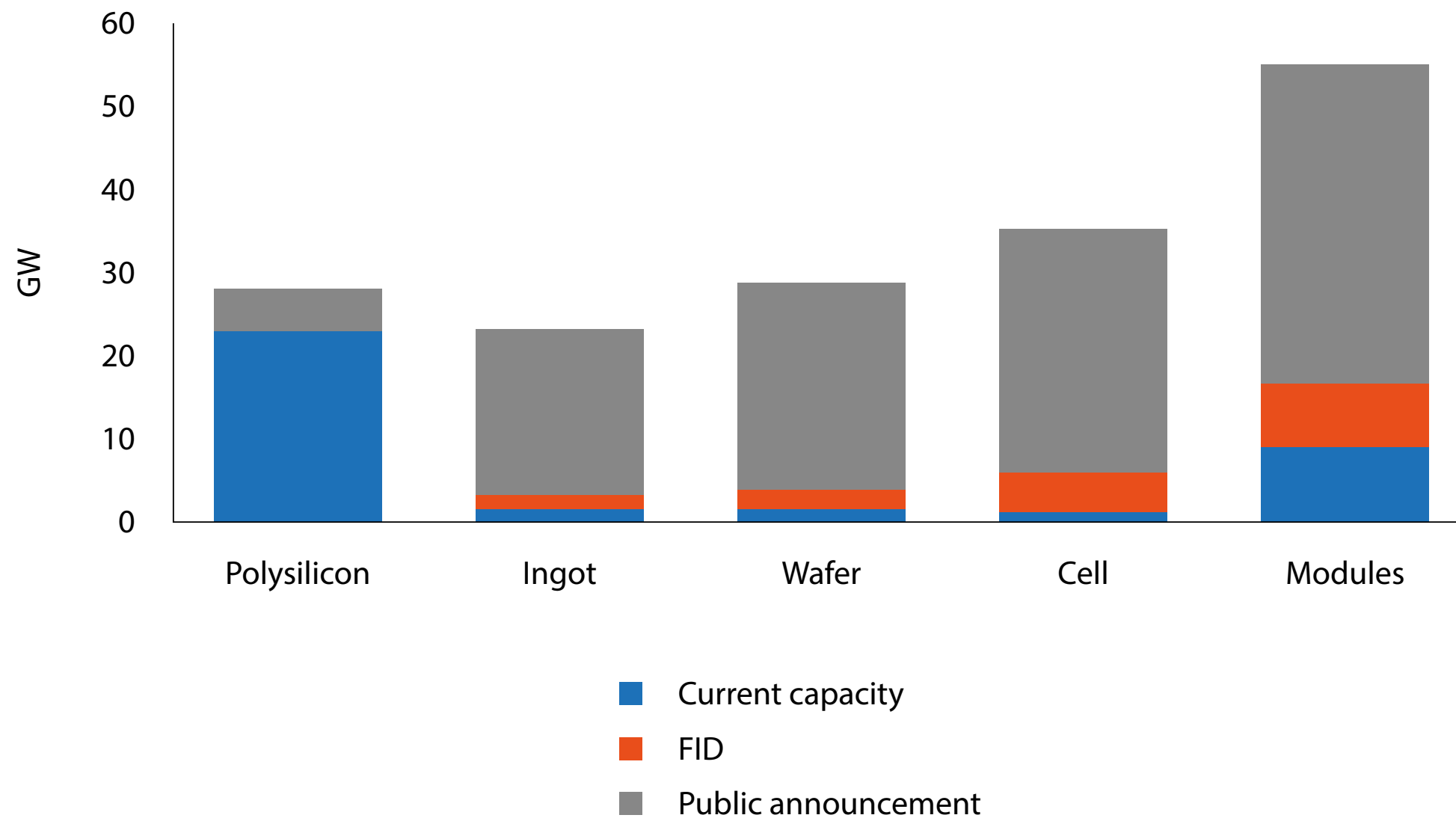
2.2 Solar PV manufacturing: the diverging trajectories of Europe and China

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 prices⁸, 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 price⁹.

The Commission proposed the 'price undertaking' agreement¹⁰, 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 panels¹¹. 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 Asia¹².

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 energy¹³ 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.

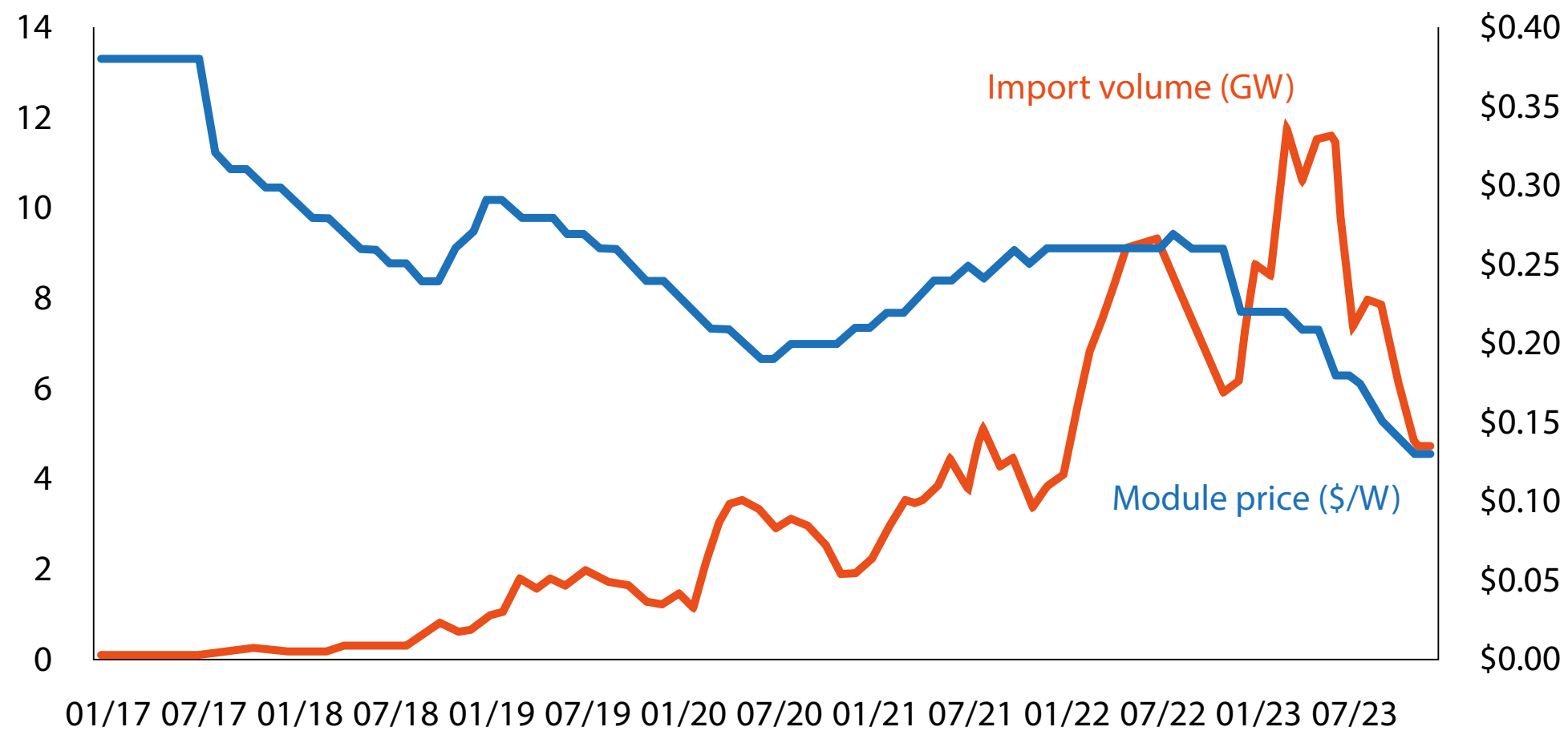
Attempts in the US to stimulate domestic solar PV manufacturing offer another perspective on this cost differential. Support under the US Inflation Reduction Act is estimated at between \$0.11 and \$0.18 per watt (Bettoli *et al* 2022), meaning that public support will closely match, and possibly exceed the total cost of producing a solar panel in China. The US has also implemented tariffs on the import of Chinese solar panels¹⁴, 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 insolvency¹⁵, 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 chain¹⁶.

In January 2024, the European Solar Manufacturing Council wrote to the European Commission asking for emergency measures¹⁷. 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 panels¹⁸ 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 products¹⁹.

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 deploy²⁰, 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.

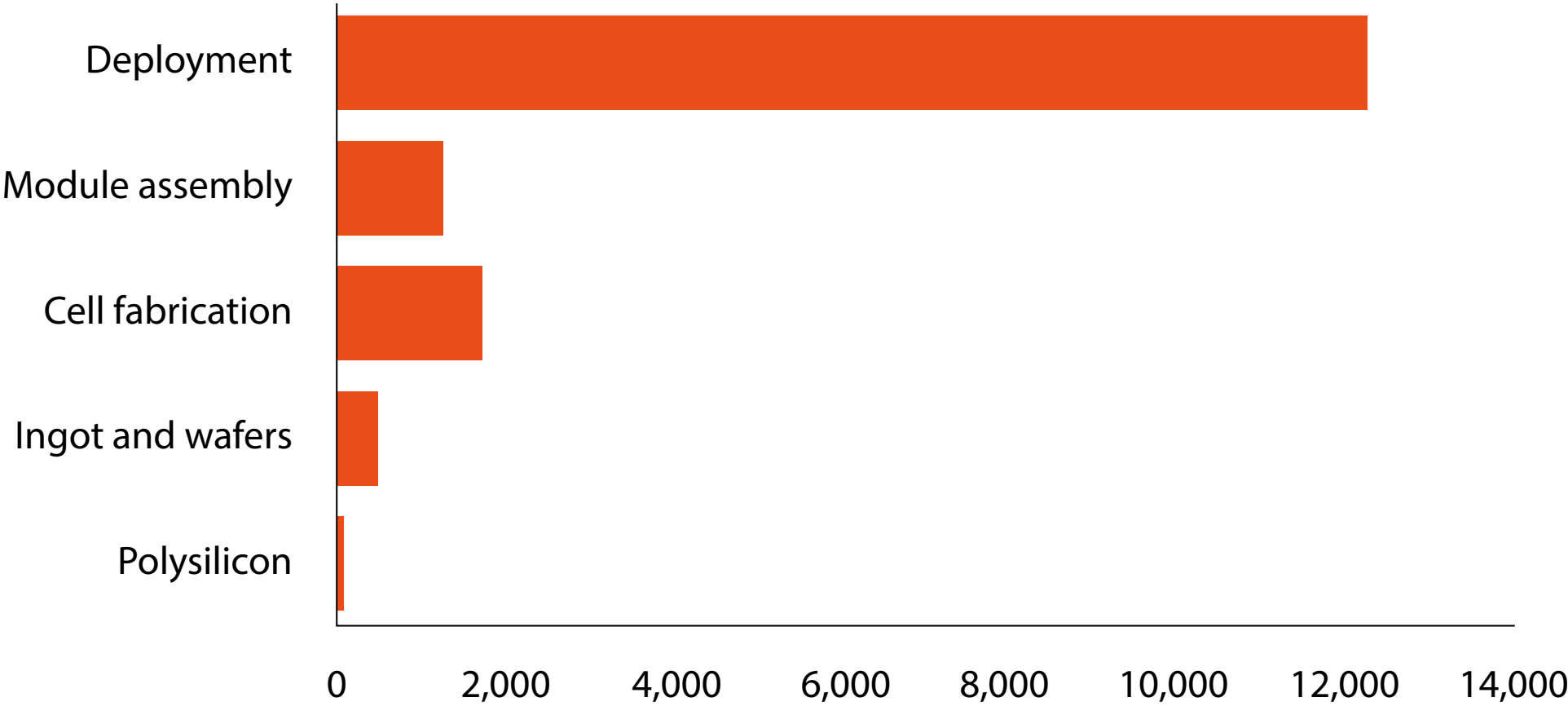
To create jobs in this sector, the EU would thus better focus on accelerating the deployment of solar energy. Imposing trade restrictions on Chinese solar panels would lead to higher costs, slowing deployment of panels and, possibly, a net-negative job effect. That would occur if more jobs were lost 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

www.worldcommercereview.com



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 prices²¹.

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 panels²². 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 heating 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 panels²³, 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.

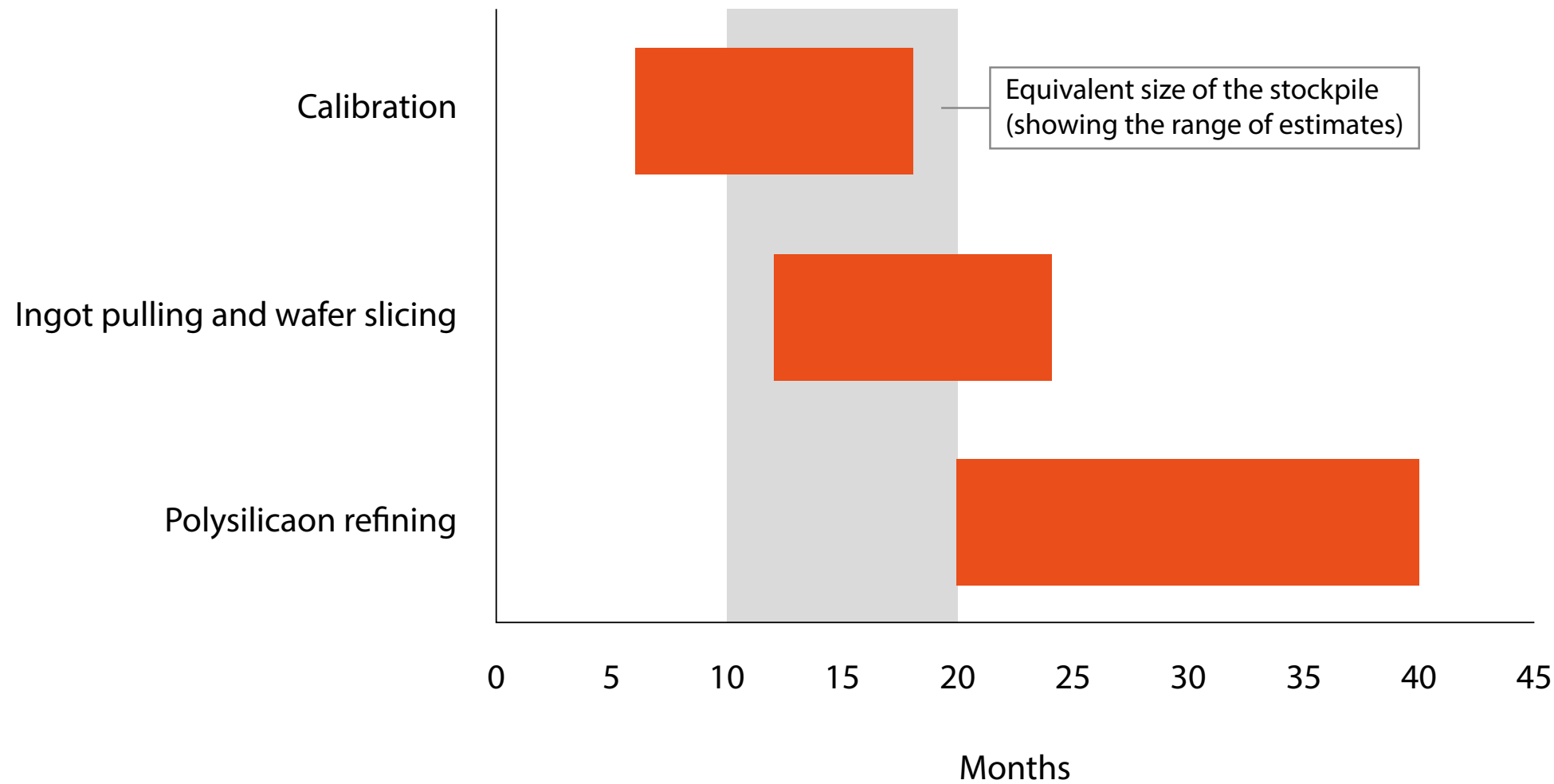
Figure 5 shows the size of the current stockpile in terms of current monthly installations, and the estimated time it would take to build new factories for key components of the solar value chain.

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

EU lead times for solar PV manufacturing by supply chain segment

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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 imports²⁴.

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 annually²⁵. 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 operation²⁶.

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 targets²⁷. 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 countries²⁸ 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 transition²⁹, 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 subsidies³⁰. 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 Directive³¹. 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 Europe³² and EIT RawMaterials Innovation Hub Central & West³³ 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.
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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Climate policies carry political costs, but those costs can be mitigated

Davide Furceri, Michael Ganslmeier and Jonathan Ostry argue that climate policies must be calibrated carefully if they are to be accepted by the public and thus not hurt politicians' electoral chances

The global agreement to move away from coal, oil and natural gas, reached at the December 2023 COP28 climate summit in Dubai, exceeded the expectations of some, but was seen by others as a compromise that fell short of phasing out fossil fuels entirely. Nevertheless, it is a small step towards the ultimate goal of reducing reliance on fossil fuels in reality. Progress will now depend on policies adopted by countries and on the decisions of households and firms in response to new incentive structures.

Perhaps the greatest roadblock to a greener future is the hesitancy of politicians to implement such policies and structures, which should ideally alter incentives away from fossil fuels quickly and fundamentally.

Politicians hesitate to act on the grounds of economic efficiency alone, even though median voters in many countries have become greener over time and support for ambitious climate change policies remains strong among the electorate (Van der Duin *et al* 2023).

But such support is far from unconditional and depends on the changes to people's lives climate policies will require¹. For politicians, the concern is that insufficient attention paid to the economic and social impact of environmental policies will hurt them in the run-up to elections.

Politicians' fears have a rational basis in terms of possible blame for the collateral effects of green policies that may create economic hardship. Such losses may be immediate, visible and concentrated, while the benefits of climate policy may be diffuse and postponed, and perhaps even invisible to voters (since they amount to the prevention of environmental damage).

Distributional consequences associated with the phasing out of combustion engine vehicles and traditional domestic heating systems, however, are immediately visible to voters. Opposition to such effects is understandable.

The status quo bias in policymaking is not new. It plagues areas including contending with unsustainable fiscal deficits or implementing productivity-enhancing reforms (structural reforms). War-of-attrition models (for example, Alesina and Drazen, 1989) have been used to study policy outcomes in situations when there are multiple veto players, and welfare-enhancing reforms with the potential to make everyone better off are delayed until one of the veto players concedes, once it becomes apparent that the cost of continuing to fight exceeds the cost of the concession (the loss – or distributional penalty – from the reform itself).

Policy design can be tweaked to make CCPs more acceptable to voters

The sentiment that there is a political penalty to be paid from structural reform (Ostry *et al* 2019, 2021) was expressed in the 1990s by Jean Claude Juncker before he became President of the European Commission: *“We all know what to do; we just don’t know how to get re-elected once we’ve done it.”*

Niccolò Machiavelli expressed a similar idea half a millennium earlier when he warned that reformers would have as enemies *“all those who have done well under the old conditions”* and only *“lukewarm defenders”* in those who may do well in the new situation.

What will it cost?

In Furceri *et al* (2023) we estimated the average effect of climate change policies (CCPs) on popular support for the government implementing them. We used the OECD’s Environmental Policy Stringency (EPS) indicators (Botta and Kozluk, 2014) as proxies for CCPs, and the International Country Risk Guide² Index of Popular Support to proxy the level of government support. Our assessment covered 30 developed and emerging economies between 2001 and 2015 (see Furceri *et al* 2023, for technical details).

The popular support measure is based on opinion polls and scaled between 0 (high risk of losing office) and 4 (low risk). The OECD’s EPS measure is the most comprehensive source for environmental policy measures across countries (28 OECD and six BRICS countries) and time (1990 to 2015)³. All policy indicators are scaled from 0 (not stringent at all) to 6 (very stringent).

In addition to its wide geographical and temporal coverage, the dataset includes both market-based and non-market-based measures, such as indices of taxation of emissions, trading schemes and feed-in tariffs (market-based), and indices of emission limits and research and development subsidies (non-market-based). The availability of these sub-indices allowed us to test whether some instruments are politically costlier than others.

We found that, overall, increasing environmental policy stringency has significantly negative and sizeable effects on popular support for the government. A government moving from the first to the third quartile of the EPS distribution will experience on average a 10 percent decline in popular support (Figure 1)⁴.

This impact is equivalent to a decline in vote share of about 11 percent during election years – a sizable impact, especially when electoral outcomes are close. These results are robust to alternative sets of controls and the magnitude of the coefficients does not change with model specification.

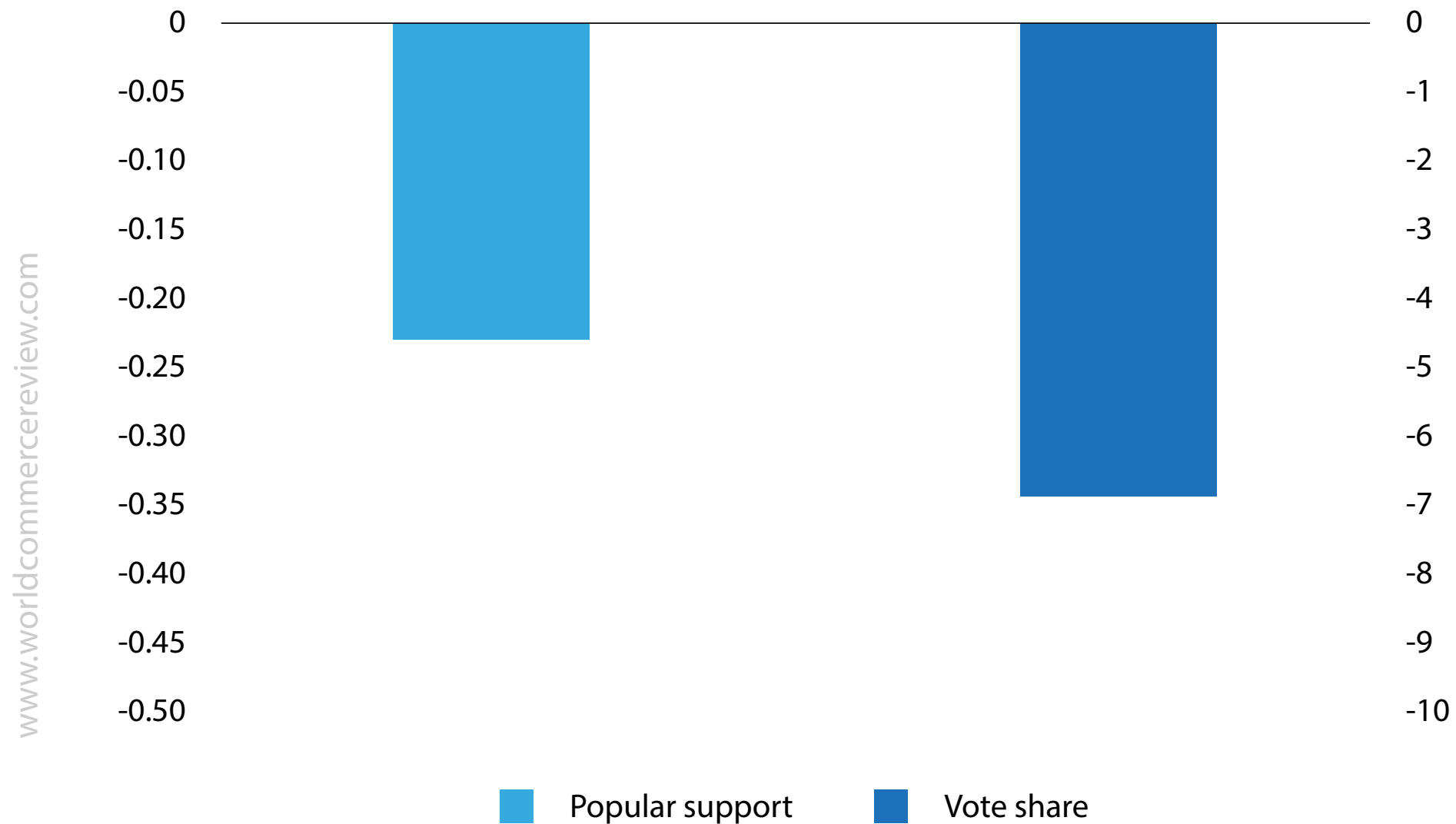
We also used an instrumental variable (IV) approach to estimate the causal effect of CCPs on popular support for the government⁵. Our instrument interacts a time-varying global term capturing cross-national pressure for climate change policies (the occurrence and impact of global extreme weather events) and a country-specific term capturing the vulnerability of a country to climate change (such as the length of its coastline as a gauge of vulnerability to rising sea levels). The IV estimates suggest a much larger political cost of CCPs than the estimates described above⁶.

Unpacking the cost

More detailed examination shows, however, that careful policy design offers pathways to mitigate the political costs, in three respects. First, the adverse effect on popular support is markedly different depending on the type of instrument used.

Market-based measures, such as emissions taxes, lead to significant drops in popular support (Figure 2). But non-market-based measures such as emission limits do not entail significant political costs.

Figure 1. Impact of stricter environmental policy on popular support (left axis) and vote share (right axis)



Note: The left bar shows the effect on popular support of an increase in EPS, while the right bar shows the impact on vote share for the incumbent in election years from a change in EPS.
Source: Furceri et al (2023).

Though many economists see Pigouvian taxation as the first-best corrective tool for carbon emissions, opting for second-best nonmarket-based measures can be an effective alternative when market-based measures are not politically viable.

Second, timing and country characteristics matter. Political costs are higher when CCPs are adopted in times of high global fuel prices, but are statistically insignificant at times of low fuel prices (Figure 3)⁷. These findings suggest that political costs depend on the visibility of the reform and on the existing price level of affected products (eg. fuel).

CCPs also create a greater political backlash when adopted in economies that depend heavily on dirty energy sources. Economic diversification is thus an important overarching consideration.

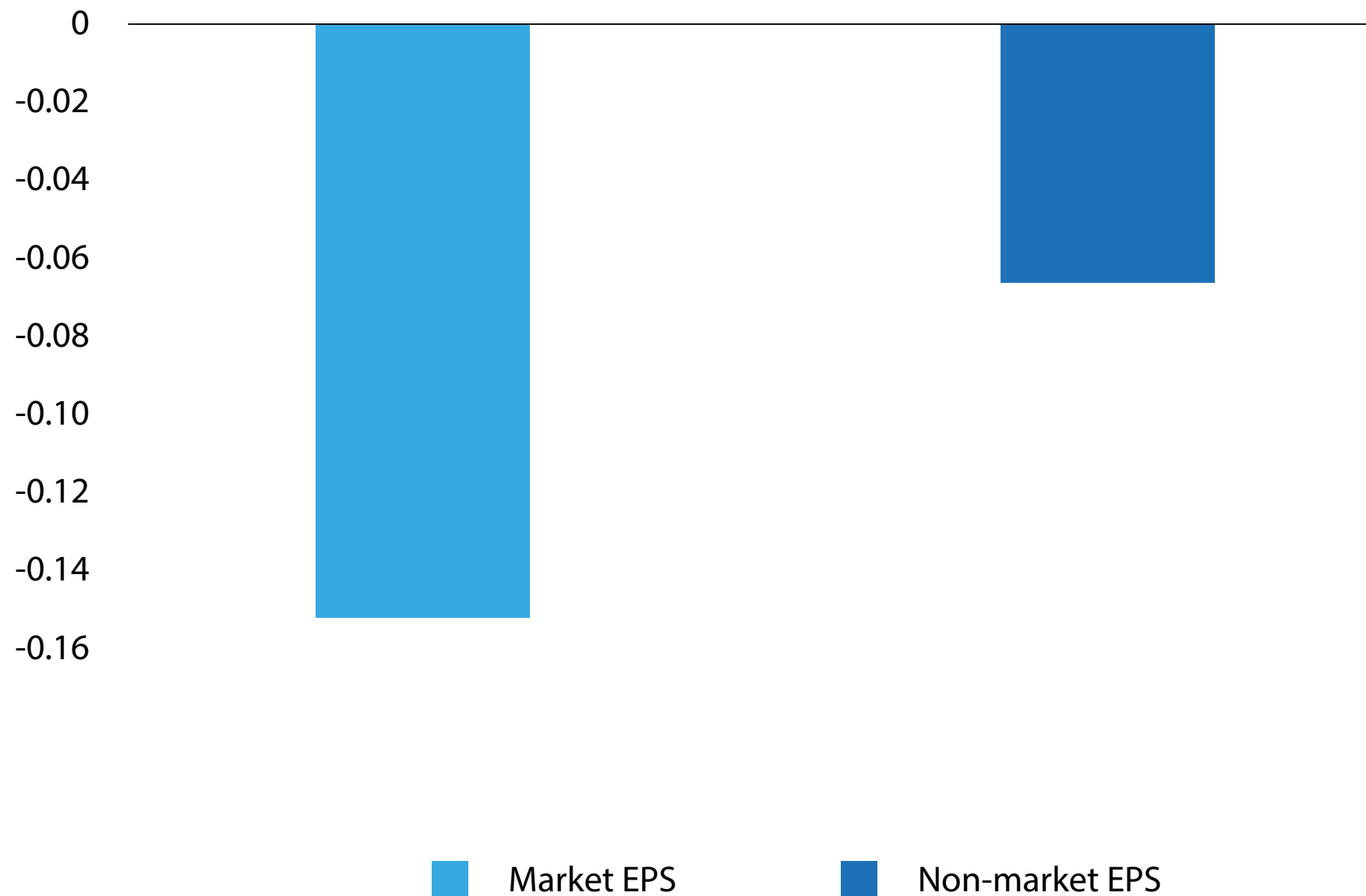
Third, political costs are higher when inequality is relatively high and when social benefits – in the form of direct transfers to households, unemployment benefits and active labour market policies to help job reallocation – are relatively low⁸.

Remarkably, if inequality is low and benefits are high, the political cost of CCPs are statistically not different from zero (Figure 3). Climate-related policymaking is thus ultimately a social question, and sufficient social-insurance mechanisms are vital to enable the adoption of CCPs in a politically feasible fashion.

Policy design can help deliver a pathway out of political hesitancy

Successful implementation of climate-change policies requires political and popular support. Policy design is critical, in terms of instrument choice and the social policies that accompany a tightening of CCPs.

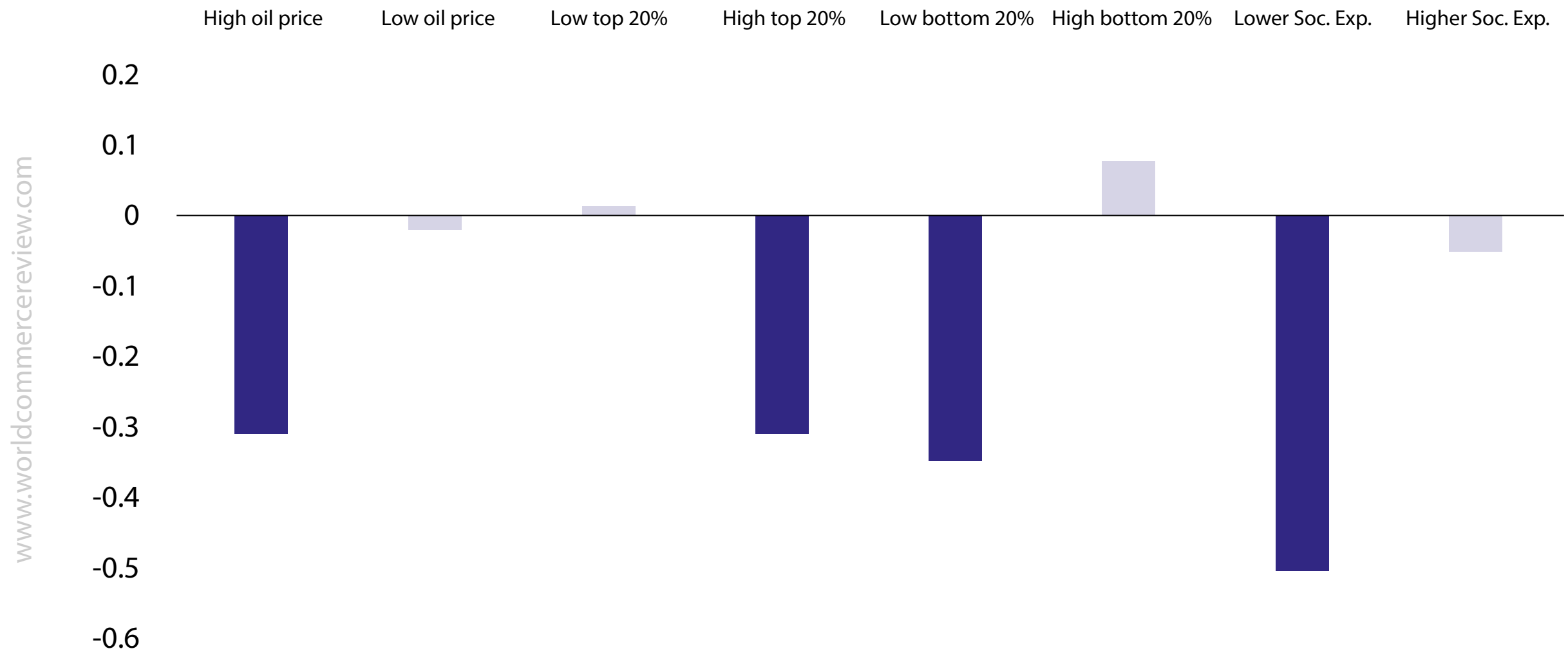
Figure 2. Effect of market- and non-market-based instruments on popular support



Note: Bars denote effect of a change in climate change policies on popular support for the government. Dark (light) blue indicates that the effects are (not) statistically significant at the 10 percent level.

Source: Furceri et al (2023).

Figure 3. The impacts of changes in CCPs on popular support: role of global energy prices, inequality, and social insurance mechanisms



Note: Dark (light) shading indicates (in)significance of the effect at the 10 percent level. Top and bottom income shares in the figure refer to shares of pre-tax national income.
Source: Furceri et al (2023).

Market-based instruments (taxes) seem far more politically toxic than non-market-based instruments (emission limits and regulations). Generous social welfare policies and active labour market policies are essential to mitigate the political costs from environmental policies.

Research has shown that some environmental policies are unpopular among some voters, but there is little evidence on how adoption of CCPs affects the popularity of the government overall.

Our research sheds some light on how environmental legislation translates into political costs for incumbents, and how policy design can be tweaked to make CCPs more acceptable to voters. ■

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Endnotes

1. See for example Jonathan Ostry, '[Politics, as well as economics, matter when making climate policy](#)', Financial Times, 27 August 2023.
2. See <https://www.prsgroup.com/explore-our-products/icrg/>.
3. As our data ends in 2015, it was not possible to test within our sample whether the COP21 meeting in 2015, where the Paris Agreement was adopted, raising the ambition of government policies on climate change and increasing public awareness of the science around climate change, had an impact on the relationship between environmental policies and popular support.
4. The EPS varies from 0 to 6. A movement from the first to the third quartile of the EPS distribution corresponds to a movement of about 1.5 points.
5. The IV approach makes use of four alternative instruments, with each being the interaction between a global time-varying term and a constant country term. In all cases, the first-stage estimates suggested that the instrument is strong and statistically significant. To test the validity of the instruments, we checked whether the instruments have a direct effect on popular support by including them (stepwise) as additional controls in the baseline model: the instruments are invariably insignificant. We also directly tested the association of the baseline residuals with the instruments and found the relationship to be indistinguishable from zero. These findings support the validity of the instruments.
6. The direction of the bias in OLS is unclear ex ante. On the one hand, governments might require political capital to implement unpopular reforms. This mechanism implies a positive effect of the dependent variable on our policy variable and biases the OLS estimate towards zero. On the other hand, a government might implement CCPs because its unpopularity implies it has little to lose from reforming. This would imply a negative effect of popular support on CCPs and thus the possibility that the OLS estimate could overestimate the true effect. It turns out that the magnitude of the IV coefficient is (more than) three times larger than the OLS estimate, which suggests that OLS estimates are biased towards zero. This is informative given that the direction of bias is ambiguous ex-ante. See Furceri et al (2023) for details.

7. These results are obtained in a model in which the change in EPS is interacted with a smooth transition function of the level of world energy prices. It is also the case that political costs are higher within one year of an election and are statistically insignificant at other times over the electoral calendar: Furceri et al (2023).
8. These results were obtained in a richer model in which the change in CCPs is interacted with the level of inequality or the generosity of social benefits using smooth transition functions of each. The inequality measures consist of: the GINI (net and gross); top and bottom income shares (1 percent, 10 percent and 20 percent). The social insurance measures (sourced from the OECD), sometimes referred to as 'fiscal sweeteners', consist of: total public social expenditure as a percent of GDP; public social expenditure for active labour market policies as percent of GDP; public social expenditure for unemployment benefits as percent of GDP; social benefits to households in cash; and social benefits to households in kind.

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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.

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'

Carbon dioxide (CO₂) 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 (Känzig 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)¹.

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.

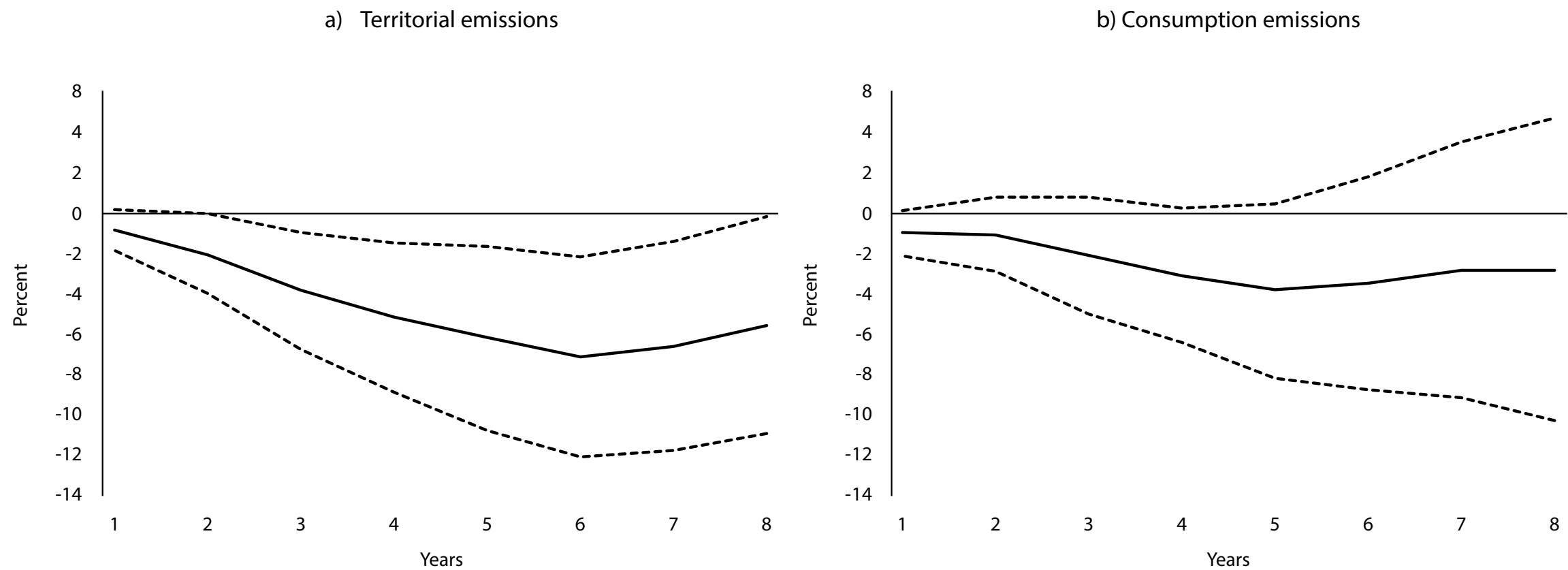
Countries that are more open to trade see no significant impact of carbon taxation on consumption emissions, while countries that are less open to trade see a significant reduction. These results suggest that openness to trade is a key country characteristic enabling carbon leakage.

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). ■

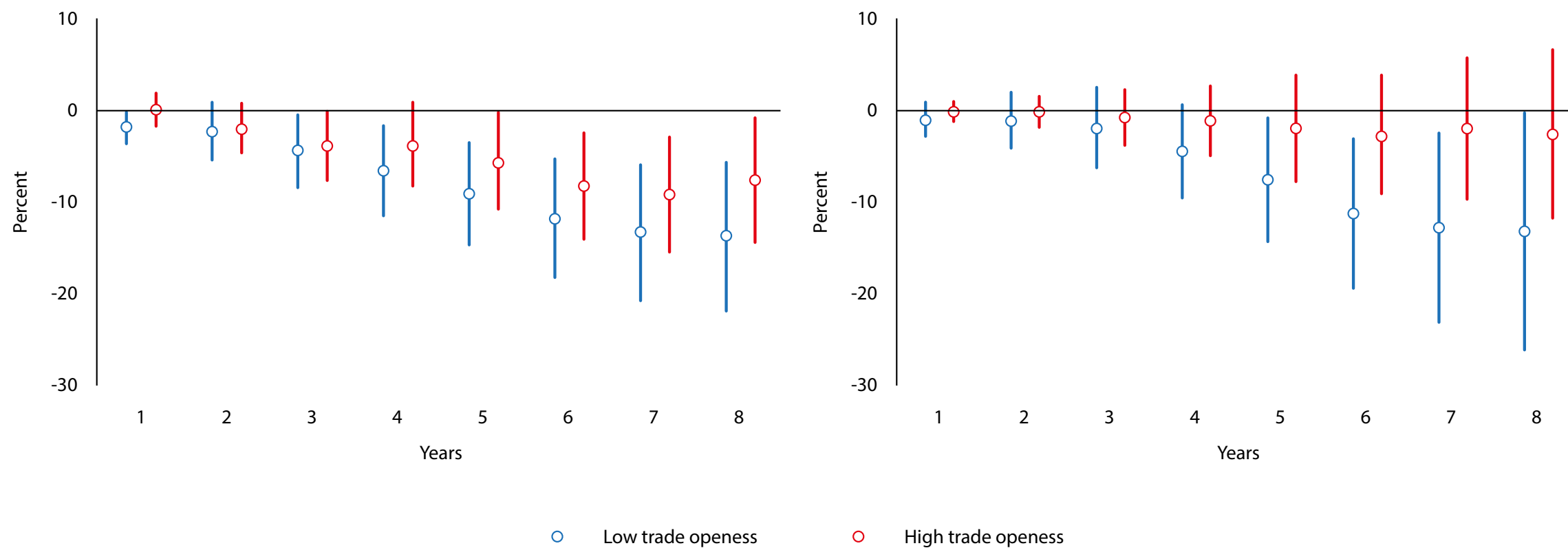
Christofer Schroeder is an Economist Graduate Programme Participant in the Directorate General Economics, Livio Stracca is the Deputy Director General Financial Stability, both at the European Central Bank

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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