

# WORLD COMMERCE REVIEW

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PIERRE MOSCOVICI OUTLINES  
THE EU AGENDA FOR TAX  
TRANSPARENCY

THE CONFEDERATION CAN'T  
SOLVE THE UNION'S PROBLEMS,  
BENJAMIN ZEEB AND JULIA  
BERGHOFER WRITE

ANDRUS ANSIP WRITES ABOUT  
THE MAJOR ADVANCE TOWARDS  
CREATING A TRUE DIGITAL  
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# A divided Europe

**E**ight years of crisis, and counting, has damaged Europe's social fabric and culminated in a Europe that has lost legitimacy with its own citizens. Europe's establishment has not succeeded in demonstrating that the EU and the eurozone is serving the interests of the people. Voters don't seem to be keen on moving more power to Brussels. On the contrary, eurosceptic parties on the left and right are rising in popularity.

The European electorate is becoming even more disenchanted with the region's integrationist elite. It will become much harder for the EU to adopt reforms widely regarded as necessary to create dynamic growth in the future.

In a new report on the eurozone, the International Monetary Fund says that 'growing political divisions and euroscepticism have weakened prospects for collective action, leaving the euro area increasingly vulnerable to a number of risks'.

'Without more decisive actions to boost growth and strengthen integration, the euro area may be subject to instability and repeated crises of confidence', the IMF continue.

As yet there has been little political integration among member countries to prevent dangerous imbalances, and there is little direct central control on the spending, taxing and borrowing of eurozone members.

Unemployment across the region stands at an alarming 10 per cent. Financial and industrial output in many EU countries has been stagnating or falling for several years. Budget deficits and debt are also piling up in the eurozone, rendering several countries close to bankruptcy.

The International Monetary Fund says that bad loans by the banks stand at a breathtaking €900 billion. The European Central Bank has sought to re-float the banking system by pumping €40 billion of free money into the system each month, in the hope of reviving lending. Yet the massive 'quantitative easing' programme is struggling to make any difference. Now, the IMF has warned that 'left unaddressed', the mounting problems of eurozone banks could lead to 'systemic risk' — a posh phrase for Europe-wide collapse.

European governments and institutions need to demonstrate to the populace that they have taken on board the advice and have concrete plans for reforms that will work in reducing unemployment and to increase growth. In other words, that they see a future of prosperity for Europeans affected by the policy failures of the past.

Europe needs to adapt to the current realities. Otherwise Europe's way of life will be under sustained and serious threat. ■

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**6** **The EU agenda for tax transparency**  
Pierre Moscovici says we are witnessing a generational shift when it comes to tax transparency in the EU and internationally



**10** **Why the Confederation can't solve the Union's problems**  
Benjamin Zeeb and Julia Berghofer discuss multiple crises in Europe and argue that the Europeans have to build up a political union that is able to defend common interests by means of democratically legitimised institutions



**14** **Important steps made towards a Digital Single Market**  
Andrus Ansip writes that the European Commission has made a major advance towards creating a true Digital Single Market (DSM) for Europe, with two new packages of initiatives

**16** **Europe's digital transformation**  
Measures designed to speed up the digital transformation of industry should remain at the core of what the EU is trying to achieve, John Higgins writes

**20** **Central banks and digital currencies**  
Ben Broadbent looks at innovation in private sector digital currencies, asks what is a central bank digital currency, and what might be the economic implications of introducing one



**28** **How the blockchain enables a new economy**  
This crypto economy will transfigure businesses, government and our society, perhaps even more profoundly than the internet did, says William Mougayar

**32** **Going digital: the benefits of a digital organization in financial services**  
The organization of digital efforts is a key aspect of every digital transformation and banks and insurance companies that are able to transform themselves will be better prepared to ride the digitalization, write Alejandro Gonzalez and Pedro Fernández

**36** **Cybersafety and cybersecurity – priorities for Bermuda**  
The Department of E-Commerce within the Ministry of Economic Development has cultivated many partnerships in the public, private and third sector as they all find synergies to deliver their common online safety message more effectively

**38** **Trade matters for jobs and growth**  
The International Chamber of Commerce would like to hear more talk about why trade matters; how the gains from trade are realized; and about how concerns about trade's disruptions can best be handled

**40** **EU-China FTA: why do we need it? How should it look like? What will it bring?**  
The economic potential in bilateral trade could be significant, Federica Mustilli, Mattia Di Salvo and Wenian Hu find





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44



48



52

**44** **Modi 2.0: revisiting relationship capitalism**  
Deepanshu Mohan asks if the government can make a move from relationship capitalism to one where the markets compete freely across sectors

**48** **Pyramid vs. oceanic circles. Facilitating sub-regional trade for sustainable development**  
Bipul Chatterjee and Susan Mathew deliberate on why South Asia needs to adopt an oceanic circle model vis-à-vis pyramid model for facilitating trade

**52** **EBACE2016 showcased business aviation's size, strength, diversity**  
Ed Bolen reviews Europe's premier showcase for business aviation, which provided an opportunity for dialogue between regulatory authorities, business leaders and other stakeholders

**54** **The Cayman Islands Aircraft Registry: a first class experience**  
Danielle Roman and Tracey Forbes examine how the CAACI has embraced the requirements and spirit of the Cape Town Convention, which has fortified the Cayman Islands' position as an offshore market leader in both commercial and corporate jet financing and as an aircraft registry of choice

**58** **Aircraft ownership solutions**  
KHMA offer a convenient, accessible and specialist services that reduce the administrative burden while maximising the benefits of ownership

**60** **Equipping managers to help the world**  
Alexandra Santos and Mathabo le Roux explain how a UN initiative is encouraging business schools to prepare students for tackling poverty and other development challenges

**64** **Combatting climate change**  
Matthias Kroll looks at financing the 1.5°C limit by matching new 'green helicopter QE' with private capital

**66** **Methane regulations an expensive mistake**  
Tim Ball and Tom Harris examine the costs to the oil and gas sector by the EPA's misguided regulations

**70** **Climate science, energy policy, poverty, and Christian faith: how do they connect?**  
E Calvin Beisner finds that the campaign to fight global warming by reducing fossil fuel usage is in fact a campaign of anti-humanism, condemning the world's poor to low incomes and high rates of disease and premature death



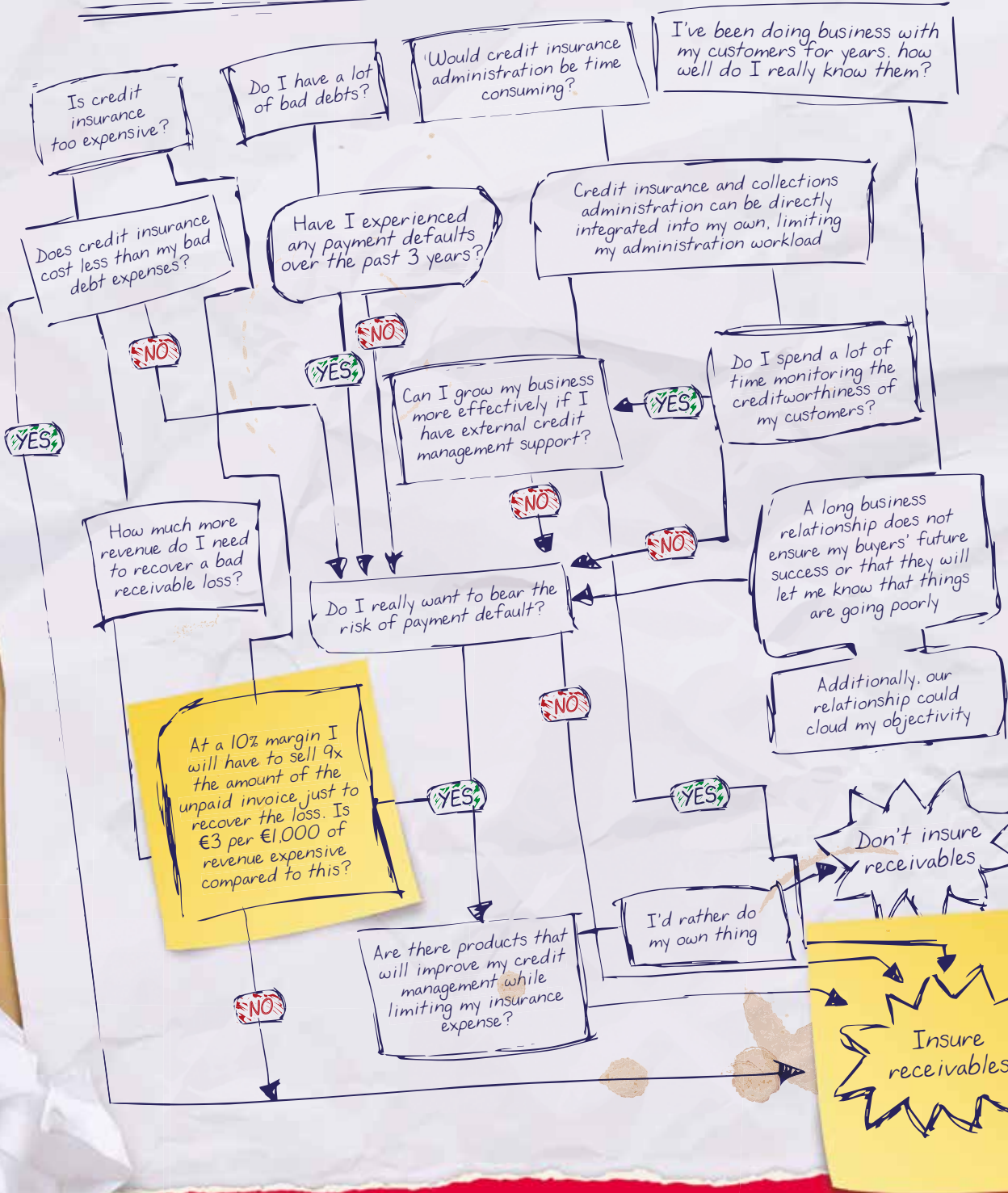
60



64

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# The EU agenda for tax transparency

**Pierre Moscovici is European Commissioner for Economic and Financial Affairs, Taxation and Customs**

**F**rom the very beginning of my mandate as European Commissioner responsible for taxation, I have been intent on pursuing a ‘transparency revolution’. I have been keenly aware of the need to inject more openness, more cooperation and more trust into taxation—in Europe and beyond. Why?

Because transparency is the bedrock of everything that we want to achieve in EU tax policy. It is essential for fairer and more effective tax systems that support growth and jobs. It is vital to ensure that countries can rely on sustainable revenues, without being undermined by opaque regimes elsewhere. It is central to creating a healthier and more competitive business environment, where all companies operate on a level playing field. And it is fundamental to re-establishing citizens’ confidence in our tax systems, which has suffered a blow in recent years due to revelations of wide-scale tax evasion and avoidance, the latest one being the Panama Papers revelations.

Historically, the EU has a good track record when it comes to tax good governance. In fact, we have long been flag-bearers for transparency in the international arena. The EU was the first region in the world to apply the automatic exchange of information as a tool against tax evasion – and we were active in encouraging international partners to follow suit.

We rapidly enshrined the new global transparency standard into EU law, enabling member states to automatically exchange information on financial accounts from January 2017. We have signed ambitious transparency agreements with our closest neighbours, including Switzerland, which effectively implement the global standard and put an end to bank secrecy in the European continent. We also have strict legislation in place to prevent money-laundering and financial crimes, which we are going to further reinforce. On the corporate tax side, we have had an EU peer review system in place against harmful regimes for nearly 20 years, as well as important transparency requirements for the financial sector and extractive industries.

Nonetheless, recent media scandals of wide-scale tax abuse and public demands for fairer taxation called for new efforts to raise the bar of tax good governance even higher. This was a mission that the European Commission was more than happy to take up and it did not delay in delivering far-reaching and effective proposals. Thanks to these initiatives, and a new political will amongst member states to coordinate

more closely on tax matters, the EU’s transparency revolution is now advancing at full speed.

## **Transparency package**

The Commission kicked off this new agenda towards greater tax transparency in March 2015, when I presented the ambitious *Tax Transparency Package*. At the core of the Package was a ground-breaking new proposal for the automatic exchange of information on tax rulings. This proposal aimed to tackle the long-standing problem of secrecy around tax rulings, which frequently left one country unaware of the effect that another’s tax rulings were having on their own revenues. Companies exploited this opacity to avoid taxes, while certain countries appeared to deliberately use rulings to entice mobile profits away from the base of economic activity.

Our solution has been to develop robust new transparency provisions for tax rulings in the EU, going beyond any





measures that had been agreed at international level. Under the new legislation, member states must systematically share pre-defined information with each other on all of their cross-border tax rulings and pricing arrangements, including those made in the previous 5 years.

Authorities cannot refuse to share the information and must provide additional details to any member state that may be affected by the ruling. The Commission will have access to certain data on the shared information, so that it can monitor the application of the rules and take swift action if there are any lapses. This greater transparency on tax rulings will put an end to the secret 'sweetheart' deals of the past and should deter companies from using rulings to shift profits.

In short, it is a significant victory in our campaign for fairer corporate taxation. The proposal was adopted by EU Finance Ministers after just 7 months of negotiation, sending a positive signal that member states were ready to get behind the EU drive for greater tax transparency, and it will enter into force in January 2017.

### **CBCR**

Continuing with the quest for more openness and cooperation between tax authorities, the Commission's next major transparency initiative came in January 2016. As part of a wider package of measures to combat corporate tax avoidance, I proposed that national tax authorities should exchange country-by-country reports on multinationals' tax information. Country-by-country reporting between authorities had already been endorsed internationally, under the OECD's Base Erosion and Profit Shifting (BEPS) project.

My goal was to ensure that it was swiftly, smoothly and fully implemented throughout the EU in a coordinated manner. In practice, the parent company of a multinational group will

*"We are witnessing a generational shift when it comes to tax transparency, in the EU and internationally... the primary challenge now lies in securing this new tax transparency for the long-term"*

have to provide its member state of residence with a report on key information for the entire group. The report should detail the revenues, profits, taxes paid and accrued, accumulated earnings, number of employees and certain assets of each company in its group. These reports will then be shared with all other member states where the group operates. To ensure a level playing field, the new rules have a wide scope, covering any multinational - European or otherwise - that is active in the EU internal market.

Here again, these new transparency rules were adopted by member states in record-time and will come into effect from next year. They will make an important contribution to fight against corporate avoidance, by providing tax authorities with crucial information to better target their tax audits and identify aggressive tax planning schemes.

### **Public CBCR**

While greater cooperation and information exchange between tax authorities is critical in combatting cross-border tax abuse, the Commission was also conscious of the need to extend the transparency net wider. The public demand for access to companies' tax information grew louder with each



new headline of wide-scale tax avoidance—and I shared this ambition for full transparency and actively advocated for it.

In April this year, the Commission proposed public country-by-country reporting for all large multinationals operating in the EU internal market. A challenge in developing this proposal was to find a way of providing citizens and civil society with the information they expected, while also protecting the competitive interests of EU businesses.

The right balance had to be found: I am convinced that we successfully did so. I indeed believe that we rose to this challenge with provisions that are both ambitious and well-balanced. Our proposal will require any multinational with global revenues exceeding €750 million a year and a presence in the EU to publish a specified set of tax-related data online. They should provide a separate report for every member state in which they are active, and an aggregated report for their activities outside the EU.

To intensify the scrutiny on tax havens, multinationals will also have to provide a detailed report of activities in any country listed as a problematic tax jurisdiction by the EU. These public reporting requirements are primarily aimed at making large multinationals more accountable on the taxes they pay. I am also convinced that they offer many benefits to businesses themselves. Not only will they help to restore public trust in corporations' tax practices, but they will also reinforce the level-playing field for all companies in the Single Market.

Many companies are already publishing their tax information on a voluntary basis and these binding EU rules will put them on an even footing with their less transparent counter-parts. The proposal for public country-by-country reporting is now being negotiated by member states and the European Parliament, and hopefully it will soon be part of EU law. Once it is, the EU will once again be breaking new ground and leading by example internationally in the field of tax transparency.

### Post-Panama initiatives

Despite these achievements, our transparency campaign is far from over. The recent *Panama Papers* scandal revealed that loopholes still exist in the international tax system, which allow funds to be concealed offshore and artificial arrangements to be used to escape taxation. It confirmed that there is still work to be done on tax transparency for companies and individuals, in the Single Market and beyond. In this respect, three areas must be prioritised.

First, as confirmed by the G20 in April 2016, we need to improve the transparency requirements on beneficial ownership, so that tax authorities can identify the 'real live' person behind opaque companies and trusts. The Commission will propose stronger provisions for beneficial ownership before the summer, within the EU's anti-money laundering framework, and will back international efforts to launch the automatic exchange of information in this area—which all 28 EU countries support.

Second, we must address the question of advisors or enablers and how to ensure better oversight of their activities and hold them accountable if they assist in or promote aggressive tax planning schemes. While this is a complex task, it is too important to shy away from. So the Commission has already started to examine possible options to deal with those that

facilitate and enable tax abuse, and will encourage the EU's global partners to do the same.

Third, we must ensure that the new global transparency standard – the Common Reporting Standard – is fully and properly implemented worldwide. This will provide tax authorities with a powerful instrument to detect and deal with evasion and – if applied worldwide – will leave tax evaders with nowhere to hide. The important point here is that transparency cannot have boundaries; if some countries 'opt-out' of the new global framework for more openness and cooperation on taxation, the whole structure comes crumbling down. This is no longer acceptable, and will no longer be accepted.

### EU blacklist

In the EU, we have taken our tax good governance commitments seriously, and followed through with concrete action and binding law. Now we expect our global partners to do the same. The OECD and G20 can be applauded for their work to push this agenda forward and the EU actively supports them in this work. In fact, in January, the Commission tabled a new External Strategy, through which the EU will draw on every available instrument to promote tax good governance standards worldwide.

A key initiative in this Strategy is the development of a common EU blacklist, to deal with countries that refuse to meet the required standards of transparency and fair taxation. This new EU blacklist will be based on clear and internationally justifiable criteria and on a robust screening process, and will be backed by countermeasures for listed countries that refuse to comply with international standards. Work on this listing process will start this summer, with a view to publishing a first list in 2017.

I firmly believe that an EU blacklist, with 28 member states behind it, will provide a real deterrent for countries that refuse to come on board in the global move towards fairer and more transparent taxation. Moreover, the G20's recent – and very welcome – call for an international blacklist gives additional value to this new EU listing process. It offers the EU a chance to, yet again, pave the way and provide a robust model for the international list to be built on. The EU will work very closely with the OECD to this end. And I will remain very ambitious on this EU listing process, to make sure that we deliver rapidly and completely.

### Conclusion

We are witnessing a generational shift when it comes to tax transparency, in the EU and internationally, and witnessing improvements at a pace that would have been unheard of even a decade ago. While much has been achieved and more is still to come, I believe that the primary challenge now lies in securing this new tax transparency for the long-term. In the EU, we are doing this through binding new legislation and ambitious coordinated initiatives.

However, to be truly successful, the transparency revolution must be global. The EU will continue to work closely with its international partners to achieve this – and put due pressure on those that drag their feet – so that we can cement much-needed changes and deliver the fairer and more transparent taxation that citizens worldwide are waiting for. This will remain my priority for the coming months and years. ■



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# Why the Confederation can't solve the Union's problems



**Benjamin Zeeb is the CEO of the Project for Democratic Union, and Julia Berghofer is an author at the PDU**

Europe finds itself in the middle of its deepest crisis since the end of the Second World War. We hear this sentence (or similar) quite often in these days. Amongst eurosceptics this causes enthusiasm: the European building finally begins to tremble. They regard the collapse of the EU as the desirable and inevitable end of a misguided European project. On the other side, within the pro-European educated elite the concerns are swept aside as alarmism, as part of another crisis discourse the European integration process has already passed through many in the past 50 years.

The problem is, however, that the sentence is true. The current crisis is different from others. It is not a result of political rhetoric nor primary a discursive phenomenon. The tanks are rolling in Ukraine regardless of whether we talk about them or not; the despair of the unemployed youth in Spain and Greece is real and not only a statistical fact, not just an argument used in the academic debate about the smooth functioning of monetary unions.

What is even more serious is the fact that we are not talking about one single crisis but about multiple crises. This is what makes the current situation particularly critical and dangerous. The crises manifest themselves on a number of fronts. A Greek debt haircut has been postponed until 2018, leaving Greece to suffer for another two years, while no real solution to the eurozone's economic and structural woes is in sight. Vladimir Putin recently ended up his winter military campaign in Syria and is now going on with provocative aerial manoeuvres over the Baltic Sea.

A second wave of immigration from failing states like Eritrea, Somalia and Nigeria has just begun to unfold since weather is getting warmer again, and it already claimed many victims in the Mediterranean. Furthermore, there is the British referendum over a possible Brexit that will bother us in the next few months. The already little amount of political leadership in Europe exercised by Angela Merkel is slowly vanishing in the light of the first substantial government crisis she has to deal with during her term.

The relapse into national ways of thinking and acting has already become apparent. For instance, the Netherlands overtook the EU Council Presidency for the fourth time at the beginning of the year. The prior presidencies have usually been regarded as a political success for the Dutch. They have proven their skills in 1991, 1997 and 2004. In 1991 and 1997 the Netherlands was in charge of crucial treaty negotiations,

resulting in the Treaties of Maastricht and Amsterdam. In 2004, the Dutch succeeded in opening negotiations with Turkey. This time, only few people in the Netherlands know that their country has overtaken this rather delicate task by January 2016 because national topics prevail.

Thus, the April referendum in which the Dutch rejected the trade agreement between the EU and Ukraine, was the priority on the agenda, not a pan-European strategy to deal with the refugee influx. At the same time, Poland established a right-wing and anti-European government, which may



represent some kind of punishment of former prime minister and EU council president Donald Tusk's rather Europe-friendly politics within the prior legislative period. The same Donald Tusk recently stated that *"one European nation, this was an illusion"*.

In Austria, the far-right Freedom Party (FPÖ) recently won the first round of the presidential elections, with the establishment candidate only barely carrying the final vote. In 1999, the EU imposed diplomatic sanctions on Austria when the same FPÖ entered the government. Today, no one in Brussels considers freezing bilateral relations with Hungary because of Victor Orbán or with Poland because of Beata Szydło. Although the 1999 sanctions have unleashed violent arguments among supporters and opponents, the EU was still able and willing to react to the Austrian far-right wing takeover.

Now member states have to deal with the right wing problem on their own. And despite of the EU-Turkey deal, some nations are unilaterally destroying the Schengen area by building up fences to protect themselves from uncontrolled refugee influx. Member states are letting each other down and the relapse into national thinking patterns is evident.

Nevertheless, the pro-European part of the debate is rather willing to simply wait until the storm is over than to accept that the dominance of national perspectives puts the whole integration process at risk. The European problems cannot

*"Europeans have to build up a political union that is able to defend our common interests by means of democratically legitimised institutions"*

be solved by a confederation of states where there is no consensus about to what extent Brussels or Berlin should influence national politics. This has become obvious at latest with the unsteady maneuvering between border openings and closings.

In that sense, there are clear signs that Europe could fall back into old patterns, that is the state of nationalism, within a short period of time, and hence maintain a mere selective cooperation with fellow European states in a loose confederation. While eurosceptics would be happy with this scenario, the advocates of an 'ever closer union' do not take it seriously. Yet, the erosion of the European integration project and the new rise of the nation-state is a possible alternative that looms very large now. But still the pro-Europeans treat the current crises as if it was just a setback for an otherwise intact integration process and not as an urgent problem that



calls for substantial solution – a solution which presupposes a strong European government.

In accordance to this logic that falls short of reality, the refugee crisis is mainly a problem because it undermines the Schengen principle and the social deficits in Southern Europe are critical because they challenge the functionality of the euro. European experts draw absurd comparisons by equating the French and Dutch “*non!*” in the referendums on a European constitution in 2005 with the euro and the refugee crises. It is then nothing but another stumbling block on the way to a political union that will eventually come about. However, will the political union ‘happen’ automatically? By no means.

Pro-EU voices prefer to maintain the approach of slow integration although this no longer works. On the other hand, experts regularly emphasize that there is ‘no majority at the moment’ for implementing substantial reforms that would be necessary for Europe to get back to its former scope of action and to deal with its various problems. It sounds like Brussels and Berlin are only waiting for the tide to turn. They believe that once the storm is over and the fat years are back, they could discreetly return to the mode of slow integration.

But the path of a slow and continuous process leading to an ‘ever closer union’, the European integration followed for decades has come to its logical end, especially in those two sectors that affect the core of national sovereignty at most: fiscal and foreign policy. Regarding the former, the European member states gave up their national sovereignty to take autonomous decisions once they have joined the common currency. Yet, they did not delegate this decision-making power to a higher institution. It has simply diffused, somewhere between the capitals and the European bureaucracy with the latter not having any legitimacy nor resources to intervene effectively. Hence any political action degenerates into a symbolic act and has to celebrate every unproductive compromise as success as long as it only delays the bitter end of the story.

The remaining two institutions that are still working halfway effectively, the ECB and Wolfgang Schäuble’s Eurogroup, obviously lack legitimation. Thus, to produce a minimum consensus they have to operate behind closed doors. Transparency becomes impossible and detrimental in terms of reliable negotiation results. Europe faces a binary decision: zero or one. A full democratic union or the return to the nation-state, without Schengen and without the euro, eventually also without Brussels.

There is no doubt about the fact that Europe in its present shape cannot deal with the crises. There are far too many national formulas for mitigating pan-European problems to produce effective outcomes. It is also an illusion that these problems simply disappear in the medium-term or will be solved somehow or other in the near future. State unions do not evolve through an evolutionary process; instead they are the result of a ‘big bang’. They are triggered by events not processes. Even in Germany the 1933/34 tariff union did not automatically cumulate in national unification within the subsequent six decades, but it was the result of a series of relentless wars Bismarck fought against neighbouring countries. The current strategy for political integration in

Europe on the other hand is a long-term engagement that does not finally lead to marriage; instead it will all end in tears.

Yet this insight has found few supporters and even though many experts know that the EU’s most obvious construction faults prevent us from solving our problems they do not give up the ancient narrative of slow progress. We have been worrying about the EU’s democratic deficit throughout many years but little has been done to overcome these weaknesses. Originally used for describing the lack of parliamentary representation, this term has broadened to a range of issues related with the inner shape of the EU. After the failed referendums in the Netherlands and French over a European constitution, European politics was waiting for an opportune moment to move on with a constructive integration process that will help to overcome Europe’s architectural deficits.

Today, even politicians like Joschka Fischer who usually look at the European crisis with the necessary foresight are becoming more cautious. During a panel discussion in Berlin, Fischer spoke about “*seemingly safe points of retreat*”. He believes that there are some minimum positions the pro-Europeans have to defend against the threatening waves of new nationalisms: Schengen, freedom of movement, the euro.

But there will not be a minimum consensus for Europe nor an ‘opportune moment’. The European Union needs substantial reforms to turn its struggling façade into a stable building. The way to implement these institutional changes requires a pan-European solution and legitimation. Either we establish a government of the eurozone endowed with full scope of action and legitimated by European elections, or we watch how it gets rid of itself. Until we find the political will to start reforms, each and every national election will be a potential catastrophe. Disintegrative powers may prevail only once to destroy everything we built up during decades. In this situation, (national) democracy could be a systemic risk; and waiting will only worsen the situation.

We must now launch an offensive and take advantage of the crisis. One substantial requirement is to take the return to the nation-state as an alternative to a malfunctioning EU seriously. Europe already existed in this shape in the past and it is absolutely possible that it returns to a similar arrangement in the future. The example of the Holy Roman Empire proves that there is no automatism, no invisible force that keeps the continent united in the end.

We need to avoid the ‘national solution’ although it is at least more conceivable than the continued existence of the EU in its present form. Even relatively large members of the union would dwarf on the international level. The increase in sovereignty will only be formal and it will not contribute to a broader political participation of the European citizens, because it will be difficult to enforce their national interests against powerful rivals like Russia, China, but also against the Atlantic partners in times when the EU is about to break apart.

So, if the status quo is untenable and the sole alternative is undesirable, the decision is easy: we as Europeans have to build up a political union that is able to defend our common interests by means of democratically legitimated institutions. ■

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# Important steps made towards a Digital Single Market

**Andrus Ansip is Vice-President of the European Commission in charge of the Digital Single Market**

In May, the European Commission made a major advance towards creating a true Digital Single Market (DSM) for Europe, with two new packages of initiatives.

The first will boost cross-border online trading across Europe: removing barriers, raising consumer confidence and ending discrimination. The second responds to new digital realities, with a modern policy approach to online platforms and broadcasting rules.

Both packages reflect commitments that the Commission made in its DSM strategy that I presented one year ago. Both are vital for a properly functioning DSM across all countries of the European Union.

Let me begin with the e-commerce package. We want to open up the e-commerce market so that it becomes truly pan-European, with fair conditions for consumers and business across the EU's internal borders. While more and more goods and services are traded over the internet, cross-border online sales within the EU are only growing slowly.

This should change. Consumers as well as businesses deserve better. They should not be limited to their domestic markets. They should be able to make the best of the opportunities offered by Europe's single market in the digital age. Our package addresses three main areas:

- first: it will prevent unjustified discrimination, online as well as offline. In a true single market, you should not be discriminated against based on your nationality, residence or place of establishment.

However, that does not mean making companies sell or deliver goods in every EU market. But if a consumer comes to their online store, they should be treated as if they were locals – not treated differently. But this would not include the obligation to deliver: traders would not be required to deliver cross-border but sell to them as to customers from their own country.

- second: it will increase transparency of parcel delivery prices, encourage competition, and make regulatory oversight of cross-border parcel delivery services more effective.

This will help consumers get a better and affordable deal, also a wider choice. It will help small e-retailers to

reach new customers. It will create more business for delivery providers. And to be clear: there is no intention of imposing a single price across Europe.

- third: our package will raise consumer and SME trust in e-commerce by clarifying the nature of unfair commercial practices and strengthening the enforcement of consumer rights across borders. It will also strengthen cooperation between national consumer protection authorities.

Together, these measures aim to remove the main barriers to e-commerce. Online platforms are a new reality to which Europe should respond - and should embrace.

In a short time, they have transformed our daily lives: how we sell, shop and travel; how we learn, create and are entertained.





They bring many benefits to consumers, to wider society, to industry, business and SMEs.

The guiding principle and objective is to create the right conditions for platforms to innovate, scale up and grow in the DSM. But they should do so in a fair and open atmosphere. That means equal conditions for fair and open competition.

Everyone involved in the market – traditional and online service providers – should play by the same rules, with no discrimination. Our assessment has shown that platforms are innovative, have a positive impact on our economy, and increase competitiveness. It shows that the EU is quite good in areas such as the app economy, health, finance and the collaborative economy. In order to thrive, all platforms - including European ones - need a legal environment that gives them certainty.

This is why we are very clear in our communication: there will be no horizontal new regulation or regulator for platforms. We will not change the current e-commerce framework and its liability provisions.

Of course, platforms - as well as all internet providers and online intermediaries - have to respect EU law and fundamental rights. They also have to act responsibly regarding content, and keep their activities transparent. These are important principles.

This is why we are taking a problem-driven approach. It means that if we see an issue with platforms in relation to copyright, we solve it in our copyright rules. If there is an issue related to telecoms, we solve it in our telecom package.

*“Both packages... are vital for a properly functioning DSM across all countries of the European Union”*

The first steps in this have already been taken, with our proposal on the audio-visual media services directive, where online platforms are a part of this instrument's new scope.

The principles that I mentioned also apply to broadcasting, where the significant presence of online platforms and video-on-demand providers has transformed viewing habits and behaviour. EU rules need to change to reflect this new reality – and make sure that everyone follows the same rules.

Since it has worked well, there is no need to change the 'country of origin' principle. Media service providers will continue to be subject to the rules of the country where they are based. Our proposal will also bring more flexibility to advertising rules, and bolster our efforts to promote European creative work by raising its prominence. It will strengthen protection of minors who go online to view content. It will strengthen the role played by national media regulators.

I look forward to working closely with the European Parliament and EU member states so that together, we can turn these two important packages of proposals into a reality. They are essential for building the DSM that Europe needs: one where all Europeans will gain. ■





# Europe's digital transformation

## John Higgins is Director General of DIGITALEUROPE

In the build-up to the unveiling of the Digital Single Market (DSM) strategy in May 2015 DIGITALEUROPE urged the European Commission to focus its efforts on preparing Europe's economy for the digital transformation. The package of initiatives announcement in April this year does just that. We are getting to the meat of the DSM, and not a minute too soon.

At a recent DIGITALEUROPE event in Brussels the final panel discussion involved speakers from agriculture, auto manufacturing and financial services, talking about how digital technology is already redefining their industries.

Just three years ago discussions about how drones and automated tractors can improve farmers' efficiency, how 3D-printed car parts can help build cars tailored to local market conditions, or how a phone could replace a bank card would have sounded like science fiction.

It involves science but it's not fiction. These are just a few examples of how the digital transformation is already underway.

The package of initiatives unveiled in April correctly identifies some of the core elements of the digital transformation. And contrary to what some feared, it isn't a rush to regulate.

Similarly, a second tranche of initiatives focusing on the consumer side of the Digital Single Market was unveiled near the end of May. Again, the Commission has resisted pressure to propose new legislation in the area of online platforms. So far so good.

While the consumer-oriented initiatives announced in May are necessary in order to build the DSM we would still argue that measures designed to speed up the digital transformation of industry should remain at the core of what the EU is trying to achieve. The announcements in April are therefore what we are more interested in.

And in that context the European Commission has made some pragmatic suggestions how Europe should make better use of the technologies on offer. For example, innovation in the areas of high-performance computing and cloud needs to be encouraged in an inclusive way if companies from all corners of the economy are to take advantage of the ever-increasing power of computers.

The Commission proposed creating 'innovation hubs' around Europe. This is an excellent idea. To be truly effective they

will need to be embraced by Europe's business community. We've seen really great examples of this in some of Europe's leading cities, especially London and Berlin. Their lead must be followed by others.

The focus on developing digital skills is also to be welcomed. It is important to ramp up efforts to ensure Europe has the digital skills we need to make the most of the digital opportunities. I would add that policy makers and educators themselves need training to appreciate the impact of new technologies.

The inclusive approach seen in the cloud initiative is also evident in the approach to ICT standardisation laid out by the Commission, with its emphasis on collaboration between public and private sectors.

We have a unique opportunity to master digital for the benefit of all Europeans. The digital industry will play its part but we need a business and policy environment that maximises our chances to take advantage of this opportunity.



The announcements by the Commission are a good step in the right direction.

DIGITALEUROPE wants two things for Europe; first, for us to get the best from digital – to have strong productive economies, efficient public services and citizens enjoying digital technologies as part of their daily lives. And second we want Europe to be a great place for the digital sector – including DIGITALEUROPE’s members – to thrive and grow. Put simply – ours is a vision of a Europe that has mastered digital.

We see around us everyday the great promise that digital technology offers. We watch the transformation of great European businesses. We hear about new tech, and tech-driven businesses growing and thriving, and we see the increasing attractiveness of many European cities and regions to investors. But are we doing enough to harness the potential of digital technologies, and are we doing it fast enough?

DIGITALEUROPE measures the DSM elements against a set of principles we think are pre-requisites to achieving our vision – the masters of digital vision:

Does the initiative take us towards a single market fit for the digital age? Does it break down national silos?

Will it encourage innovation and entrepreneurship?

Is the initiative simply shielding the status quo from change? For example, by protecting an incumbent industry or national icon, or trying to protect jobs threatened by technological progress or just new fair competition?

Are new rules really needed or could existing rules be used more effectively? And if they are needed have the

*“The European Commission is on the right track to tackling the obstacles that stand in the way of Europe’s digital transformation but efforts in the public and private sectors needs to be speeded up”*

policy-makers designed them in the least burdensome, and most straightforward way possible?

Does the initiative recognise the global nature of digital? If so will it encourage European companies and citizens to want access to products, services and customers from around the globe? And will it allow European businesses to take advantage of a global approach to standards?

Finally, and most important of all, will the DSM encourage economic growth and the creation of good quality European jobs?

April’s Digital Transformation-related announcements appear to uphold most of these principles. The emphasis on collaboration with industry that runs through all of them bodes well for Europe’s on-going digital transformation, but whether or not they create quality jobs and spur growth has yet to be seen. And to a large extent it depends on how long the measures the Commission is proposing will take to realise.

While policy-makers work to get the DSM up and running, industry isn’t waiting. The boundaries between industry sectors are blurring. Digital technology companies are



entering other sectors, with new value propositions. This means that value is being reshuffled among business partners, old and newcomers, and across the value chains.

There are many opportunities to be grasped and challenges to be faced by both new and traditional players across industries as smart products and services become the norm and the benefits of data driven growth become increasingly apparent. Accelerating the uptake of big data and developing digital platforms at EU level is therefore crucial for all industry players, old and new, to increase their competitiveness. But first, what do we mean by the terms 'big data', 'analytics' and 'digital platforms'?

Big data has no single internationally recognised definition. Most definitions are based on the three 'V's: Volume (a reference to massive data stores measured in petabytes); Velocity (the requirement for real-time collection/analysis of data); and Variety (the generation of data in diverse formats from a variety of collection mechanisms).

Analytics is complementary to big data, as it is the process of examining the data sets using algorithms. It is defined as the use of mathematics and statistics to drive meaning from data in order to make better decisions.

There are three kinds of analytics: descriptive analytics tell what happened in the past but not why it happened or how it might change; predictive analytics uses the past data to model future outcomes; and prescriptive analytics advise on the best outcomes considering several scenarios.

Digital platforms provide the technological basis for delivering or aggregating services/content and mediate between service/content providers and end-users. They integrate the components of industrial value chains in a seamless communication between interoperable business processes (eg. design, production, sales, logistics, maintenance).

Europe must encourage the development of competitive B2B digital platforms by setting the right enabling conditions for their inception and by creating the right framework conditions for their growth.

Data-driven innovation is unlocking new opportunities for Europe to grow its economy and address pressing social challenges. Digital platforms have already become an indispensable tool for the use of data. Digital platform providers are playing an increasingly central role in the value chain and in value generation. In the near future all EU industries will have to focus on value creation through digital platforms.

The Strategic Policy Forum on Digital Entrepreneurship, a think tank set up by the European Commission of which I am president, published a report in April called *Big data and B2B digital platforms: the next frontier for Europe's industry and enterprises*.

The report sheds light on how big data and digital platforms can help transform European industry, using three as examples: automotive, healthcare and mechanical engineering, and it makes a series of recommendations to help speed up the process of digital transformation.

These include the appointment of Chief Data Officers in each EU member state to take best advantage of Big-Data and to promote data quality and standards, as well as to provide guidance to firms struggling to navigate the complex legal landscape for the handling of personal data; to promote European digital identity (E-ID) management solutions for people and objects; and to carry out sector-by sector analysis of the opportunities for developing European business-to-business digital platforms.

In the automotive industry, for example, it is estimated that in the coming years 30 to 40 per cent of the value in the automotive value chain may pass through digital platforms. Digital players already have access to 'driver data', produced by people using services offered in connected cars (e.g. insurance, entertainment, social media, health and well-being data). Car manufacturers and digital players are partnering to use context data to offer new services, but are also competing for control of this data.

In the healthcare industry sensors allow the rise of new innovative business models, which are re-designing health management. The pharmaceuticals value chain is being heavily reshuffled to allow for personalised monitoring and performance-based drug production.

All this data populating digital platforms raises obvious security and privacy concerns. Digital innovations, such as connected cars, mobile health solutions using smart phones, together with the sharp rise in numbers of devices in networks, now offer an even broader scope for hackers and espionage. Security is becoming a real concern.

Global scandals related to data privacy and lack of accountability in data management risk damaging citizens' trust in data security. That cannot be allowed to happen.

New generation security solutions are not adopted fast enough by industry. Solutions to manage digital identities are imperative to ensure the full transition to trustworthy and efficient e-commerce solutions.

A digital identity interoperable at EU level would include all information that uniquely describes an entity, a person or a device. This legal digital ID (E-ID) would include similar properties as ID cards and serve the purpose of identity verification and data authentication.

E-ID has been talked about for many years, and governments have shown a keen interest in using E-ID for citizens' online interaction with public services. Similarly, small and medium size firms are keen to explore its use in the private sector.

But for E-ID to make a significant contribution to an improved security environment there needs to be cooperation across borders within the EU. E-ID will only fulfill its potential if a fully interoperable, EU-wide system emerges, and that remains a long way off.

The European Commission is on the right track to tackling the obstacles that stand in the way of Europe's digital transformation but efforts in the public and private sectors needs to be speeded up. ■

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# Central banks and digital currencies

Ben Broadbent is Deputy Governor, Monetary Policy at the Bank of England

## Introduction

I'm going to write about money. This should be a routine topic for a central banker, particularly one whose job title includes the word 'monetary'. It's nonetheless ground on which one treads with a bit of trepidation. That's partly because some of the big questions involved – what money is, why it exists, how and by whom its supply should be governed – seem to evoke very strong opinions. Even the great economist John Hicks, formerly of the LSE, confessed in the 1930s to some nervousness about expressing his views about the matter: *"It is with peculiar diffidence and even apprehension that one ventures to open one's mouth on the subject of money"*.

It's also because my particular focus – so-called 'digital' currencies, including the possibility of a central bank variety – is an area of active interest and research, including at the Bank of England. So rather than write an article on monetary theory, or pre-empt the results of ongoing thinking on this issue, I'll seek to make only a few very broad, conceptual points, touching on the following questions: what is the key innovation in private-sector digital currencies such as bitcoin? what is a 'central bank digital currency'? and what might be the economic implications of introducing one?

I'll be brief about the first, not least because there are good, more detailed descriptions elsewhere – including in two excellent articles by Bank economists, published some time ago in the *Quarterly Bulletin*. The main point here is that the important innovation in bitcoin isn't the alternative unit of account – it seems very unlikely that, to any significant extent, we'll ever be paying for things in bitcoins, rather than pounds, dollars or euros – but its settlement technology, the so-called 'distributed ledger'.

This allows transfers to be verifiably recorded without the need for a trusted third party. It is potentially valuable when there is no such institution and when verifying such information on a multilateral basis is costly.

Acting as a trusted third party is precisely what a central bank does. It performs that role only for one particular asset, central bank money (ie. reserve deposits held largely by commercial banks at the central bank). But the function goes right to the heart of what central banks do and how they came about. And if a private-sector digital currency uses the technology to substitute for a third-party clearer, the central bank counterpart would do the opposite. The aim would be to widen access to the central bank's balance sheet, beyond commercial banks. There's no rigid correspondence here: in

principle, one could introduce the technology and preserve the current arrangements, under which it is commercial banks that hold central bank deposits; it's also possible to increase the number of counterparties without it. But the distributed ledger would probably make it easier to do so. That might mean adding only a narrow set of counterparties – perhaps a wide range of non-bank financial companies, say. It might mean something more dramatic: in the limiting case, everyone – including individuals – would be able to hold such balances. So although they might share the same technology, and the same name, the private and central-bank versions of a digital currency are actually rather different. The one would expand what the other seeks to replace.

As far as its economic effects are concerned, my guess is that much would depend on how exactly a central bank digital currency (CBDC) is designed – and in particular the extent to which it competes with the main form of money in the economy, commercial bank deposits. As individuals, we already have the ability to hold claims on the central bank, in the form of physical cash. If all a CBDC did was to substitute for cash – if it bore no interest and came without any of the extra services we get with bank accounts<sup>1</sup> – people would probably still want to keep most of their money in commercial banks.

But even then it's likely you'd see some money moving out of existing deposits. That drain would be greater the more closely a CBDC resembles a genuine bank account. One imagines it would also be counter-cyclical – resources would flow out of commercial banks during times of financial stress, back towards them when risk aversion is low.

Shifting deposits to the central bank, and away from the leveraged commercial banking sector, has two important implications. On the one hand, it would probably make them safer. Currently, retail deposits are backed mainly by illiquid loans, assets that can't be sold on open markets; if we all tried simultaneously to close our accounts, banks wouldn't have the liquid resources to meet the demand. The central bank, by contrast, holds only liquid assets on its balance sheet. The central bank can't run out of cash and therefore can't suffer a 'run'.

On the other hand, taking deposits away from banks could impair their ability to make the loans in the first place. Banks would be more reliant on wholesale markets, a source of funding that didn't prove particularly stable during the crisis, and could reduce their lending to the real economy as a result.

This is the really main point I want to get across. Some suggest that central banks will have to issue their own digital currency – ie. to supply central bank money more widely, via some generalised distributed ledger – to meet a ‘competitive threat’ from private-sector rivals. I suspect a more important issue for central banks considering such a move will be what it might mean for the funding of banks and the supply of credit.

**Private-sector digital currencies: the distributed ledger**

After that rather lengthy introduction, let’s begin with a brief over-view of what a ‘digital currency’ is. As I say, I won’t take long over this. It’s a rich topic, goodness knows there are people who know more about computers than I do, and you can find a very good and more detailed description in the autumn 2014 edition of the Bank’s *Quarterly Bulletin*.

One thing those articles make clear is that the key innovation introduced by something like ‘bitcoin’ is not so much that it’s ‘digital’, if by that we mean that balances are stored electronically. At least in developed economies the overwhelming majority of money has long been held in bank accounts, rather than as physical cash (Chart 1 plots the history of both in the UK); almost since their invention, computers have been used by banks to record transactions between, and balances on, such accounts. If a ‘digital’ currency is one whose accounts are little more than a series of zeros and ones on some distant electronic machine, well that’s long been the case.

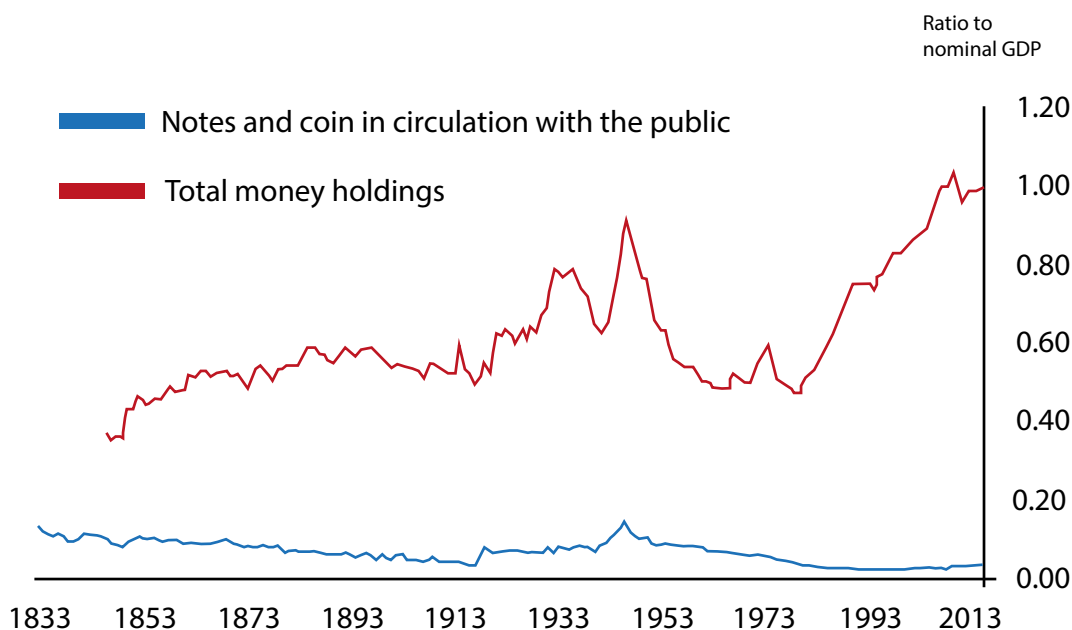
And if the word ‘currency’ indicates an alternative unit of account – the ‘bitcoin’, for example – nor is this likely to be of enduring significance. You can find goods and services quoted in bitcoin. In the United States, at a rough guess, there may have been as much as \$5 billion worth of such transactions last year<sup>2</sup>. But in a country where annual consumer spending is twelve and a half trillion dollars, that’s a negligible proportion of the total. In the opinion of most economists, it’s pretty unlikely that its use as a means of exchange will become very widespread.

*“Digital currency... offers an entirely new way of exchanging and holding assets, including money”*

It’s not just that the value of bitcoin is extremely volatile, though that’s certainly been the case (Chart 2; see also Ali et al (2014a and 2014b) and Yermack (2013) for the shortcomings of bitcoin as a useable money). One should also recognise that established currencies have a significant built-in advantage. Rather like a common language, the benefit to any individual of using a particular unit of account is greater if others use it too. That gives a big head-start to the incumbent. Switches do very occasionally happen: degrade a currency sufficiently, via hyperinflation and collapse of the banking system, and people will eventually look for alternatives. But that’s generally the sort of thing that has to happen: almost always, these currency substitutions occur only once the existing currency has become deeply compromised<sup>4</sup>. Even then, the thing people naturally reach for is an existing, trusted currency – often the US dollar – rather than some entirely new unit of account.

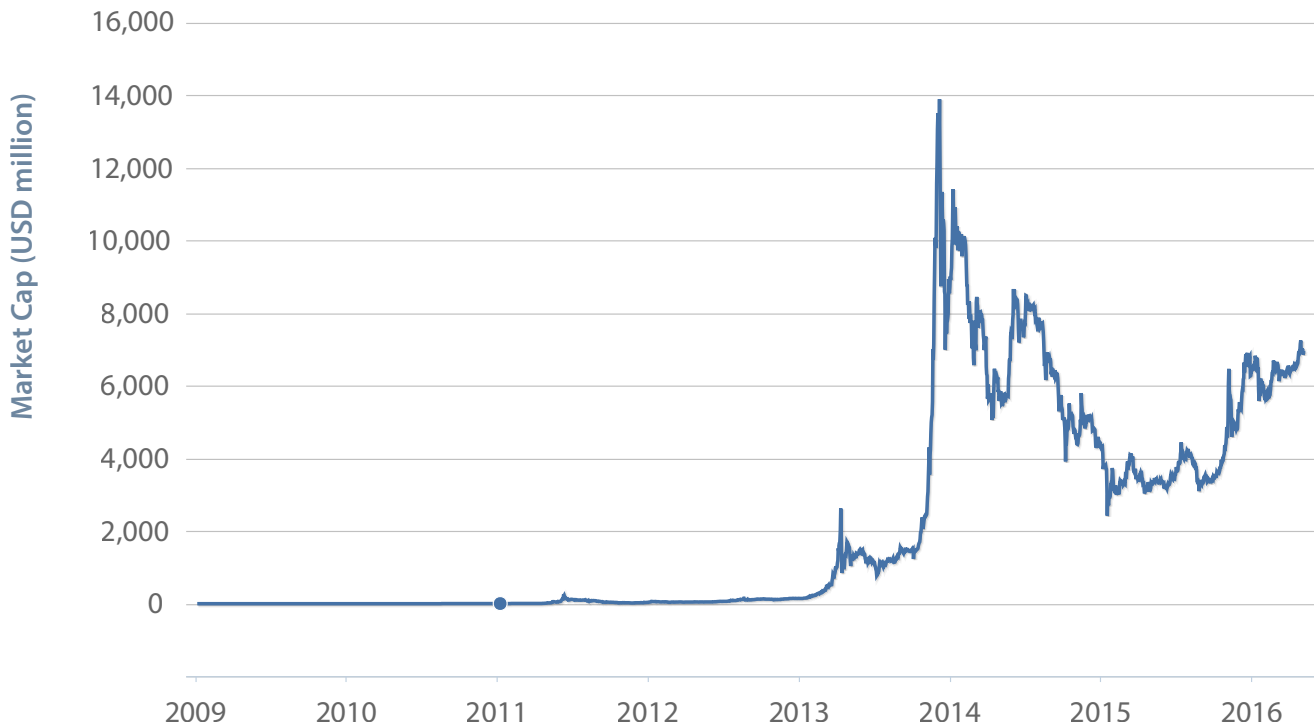
So if it’s neither the ‘digital’ nor the ‘currency’ aspect of bitcoin that matters, what is it that has sparked so much interest? Well perhaps a better name for what we’re talking about, albeit more of a mouthful, is a ‘decentralised virtual clearinghouse and asset register’. As the *Quarterly Bulletin* articles explain, the key innovation in bitcoin is its settlement mechanism. Instead of relying on an independent third party to process and record transactions, holders of bitcoin use a decentralised computer system called the ‘distributed ledger’. The distributed ledger works by encouraging users to verify for themselves, and others, blocks of transactions made over time. As everyone in the system has the right to do this, and

**Chart 1. Most money held in bank accounts, not as physical cash**



Sources: Hills, Thomas and Dimsdale (2015)<sup>3</sup> and Bank of England

Chart 2. Value of bitcoin is very volatile



Source: <http://blockchain.info>

everyone can see the results, there is no need for a trusted, centralised clearer.

In principle, this technology could be applied to many things, not just the exchange and registering of financial assets. A recent official report in the UK suggested that distributed ledgers might eventually be used for a wide variety of government services, including the collection of taxes, the delivery of benefits – potentially including new ‘smart’ transfers that could target particular groups – the keeping of business registers and other things besides<sup>5</sup>. If so, then there may be similar potential uses in the non-financial private sector.

However, it’s the application to the settlement of financial assets – above all financial securities like equities and bonds – in which the private sector has become most interested. There are several new firms seeking to exploit the opportunity.

It remains to be seen whether these ventures prove successful. But one can understand why they’ve come about. What a distributed ledger would seek to replace, in the case of securities exchange, isn’t just a single ‘third-party centralised clearer’, but a complicated system with lots of institutional layers: custodians who look after the securities and perform basic services such as collecting dividends; brokers, through whom trade orders are placed; exchanges and clearing houses where exchange and settlement occur. Each has its own particular function in the process; at each stage, there may be a degree of settlement risk; each is obliged to keep its own record of the same balances and transactions.

It’s hard to know the combined cost of these services, but a recent study estimated that, in the G7 countries, the cost of clearing and settling securities was \$54 billion a year<sup>6</sup>. These are the economic resources it requires to transfer the assets, verify who owns what, and reconcile the various records. The hope is that, by displacing these various middlemen, a distributed ledger would result in a cheaper and more secure system for providing these services.

### Central bank digital currency: who can bank at the central bank?

What, then, of the exchange of money, the particular asset for which the distributed ledger technology was originally conceived? Well that too has its own layers. Broadly speaking, at least for a given currency, there are two: commercial banks and the central bank.

As shown in Chart 1, most of what you and I consider money is held as liquid claims on commercial banks, ie. deposits. Most transactions in the economy involve transfers of these claims. That’s obviously a straightforward matter if the two parties to the transaction use the same bank. When there are different banks involved – and that’s going to be true most of the time – there needs to be a means by which one can transfer money to the other.

This is done using their deposits at the central bank – so-called ‘reserves’<sup>7</sup>. That’s why the central bank is sometimes called ‘the banker’s bank’, and why reserves are often described as ‘the ultimate settlement asset’. The function of settling inter-bank transfers lies at the heart of what central banks do and,



arguably, explains how they came about (Shafik (2016); see also Goodhart (1988)).

A 'central bank digital currency' (CBDC) would involve putting these reserve deposits on a distributed ledger. And if it allows for securities to be exchanged more cheaply and securely, might the same not be true for these money balances?

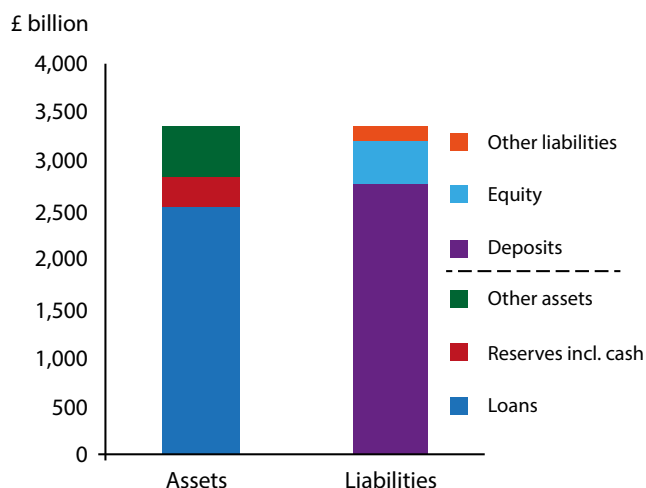
Yes, presumably. It's not clear the savings would be as large as those for exchanging securities. The current set-up, which has the central bank as a single hub through which all inter-bank transfers take place, already involves significant economies of scale. That's precisely the advantage of having a single, trusted third party at the centre: you don't need so many layers to begin with. There are certainly new technologies that can reduce, and indeed already are reducing, the costs of the front end of the existing payments system (ie. the flow of commercial bank deposits round the economy).

The ability to pay one's bills over the internet is a case in point: the more that happens, the less the need for expensive bank branches. But that is happening independently of any changes at the back end of the system, by which I mean the infrastructure for exchanging central bank money. Compared with securities settlement, that process simply has fewer middlemen for a distributed ledger to replace.

However, things do not end there. The point about the new technology is not just that it might make exchanging assets more efficient, to a greater or lesser extent. In principle, it also makes it easier to widen the access to those assets, perhaps dramatically so. If you create a platform on which the existing participants can more easily exchange central bank money, why not extend the right to others?

This certainly isn't impossible under the current settlement system, known as RTGS (for Real Time Gross Settlement). There are already some non-bank institutions that have access to the Bank of England's regular facilities<sup>8</sup>. As my fellow Deputy Governor Minouche Shafik recently explained, the Bank is currently undertaking a review of RTGS and the question of access will be one of the issues involved (Shafik (2016)).

**Chart 3. Fractional reserves: Commercial banks' liquid assets smaller than deposit liabilities**



Source: Bank of England

But it seems likely that a distributed ledger would make that process easier, opening up the balance sheet to a wider variety of financial firms. One might go further, giving access to non-financial firms, or perhaps even individual households. In the limit, a distributed ledger might mean that we could all of us hold such balances.

If so, our accounts would no longer be a claim on commercial banks but, like banknotes, the liability of the central bank.

**Would it compete with cash or with bank deposits? The CBDC and 'narrow banking'**

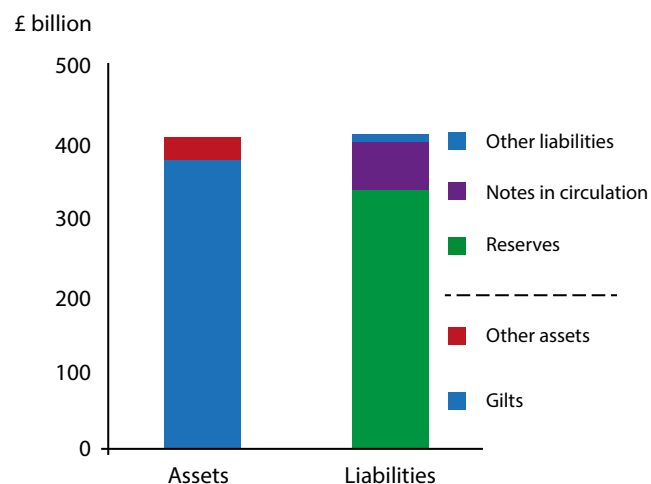
But which would it be – an actual bank account, with all the extra services such things entail, perhaps including the payment of interest; or simply 'e-cash' – something that can only be used for retail transfers and doesn't receive any interest?

This is an important question. If all it did was to reduce the demand for physical cash, it's not clear the macroeconomic effects of a CBDC would be that significant. It's possible the retail payments system might become more efficient. It's also true that, were a CBDC fully to displace paper currency, that would open the door to the possibility of materially negative interest rates (Buiter (2009), Rogoff (2014), Haldane (2015)).

But that would require explicitly abolishing cash, not just introducing an electronic alternative. As long as it's possible to hold something with a guaranteed nominal return of zero there's a similar lower bound on all other forms of money, whether reserves at the central bank or a more widely available CBDC. Leaving aside the question of whether or not you should actively get rid of banknotes<sup>9</sup>, a purely cash-like version of a CBDC would mainly involve substituting one zero-yielding liability of the central bank for another.

It seems to me that the more material effects of a CBDC would arise if it provided competition not just for banknotes but for commercial bank deposits as well. It's not simply that there's more money to play for (remember how much more is held in bank accounts). It's that the assets backing the two are qualitatively quite distinct. Shifting resources from one to the

**Chart 4. Central bank holds only liquid assets**



Source: Bank of England Annual Report 2015

other might therefore have an important effect on the relative supplies and prices of those assets.

Charts 3 and 4 make the point. Modern commercial banks, whose sterling balance sheets are aggregated in Chart 3, have what is called a ‘fractional reserve’ structure. Their holdings of liquid assets, including reserves at the central bank, are much smaller than their deposit liabilities (the purple bar). Most of their assets are loans.

But loans are ‘illiquid’: there’s no secondary market in which to sell them and, at least in the short run, their value to the creditor cannot be easily realised. Indeed, when banks attempt to do so – by demanding early repayment or abruptly curtailing lines of credit – they can cause great economic damage, as we (re)discovered after the 2008-09 crisis.

This ‘maturity transformation’ – the combination of on-demand liabilities and illiquid assets – imparts an inherent fragility to commercial banks’ balance sheets. If everyone tried simultaneously to withdraw a bank’s deposits, it wouldn’t have enough liquid resources with which to meet the demand. That’s why banks are vulnerable to ‘runs’. Taken with the economic costs of deleveraging, it’s also why society regulates and under-writes the banking system, via deposit insurance and central banks’ lender-of-last resort facilities.

By contrast, the central bank essentially holds nothing but liquid assets – largely government securities (Chart 4<sup>10</sup>). Shifting deposits away from commercial banks, and towards the central bank, would therefore make for a ‘narrower’ banking system – a ‘narrow’ bank being one whose assets are as liquid as its liabilities. In principle, it would also make for a safer one. Backed by liquid assets, rather than risky lending, deposits would become inherently more secure. They wouldn’t be vulnerable to ‘runs’ and we would no longer need to insure them.

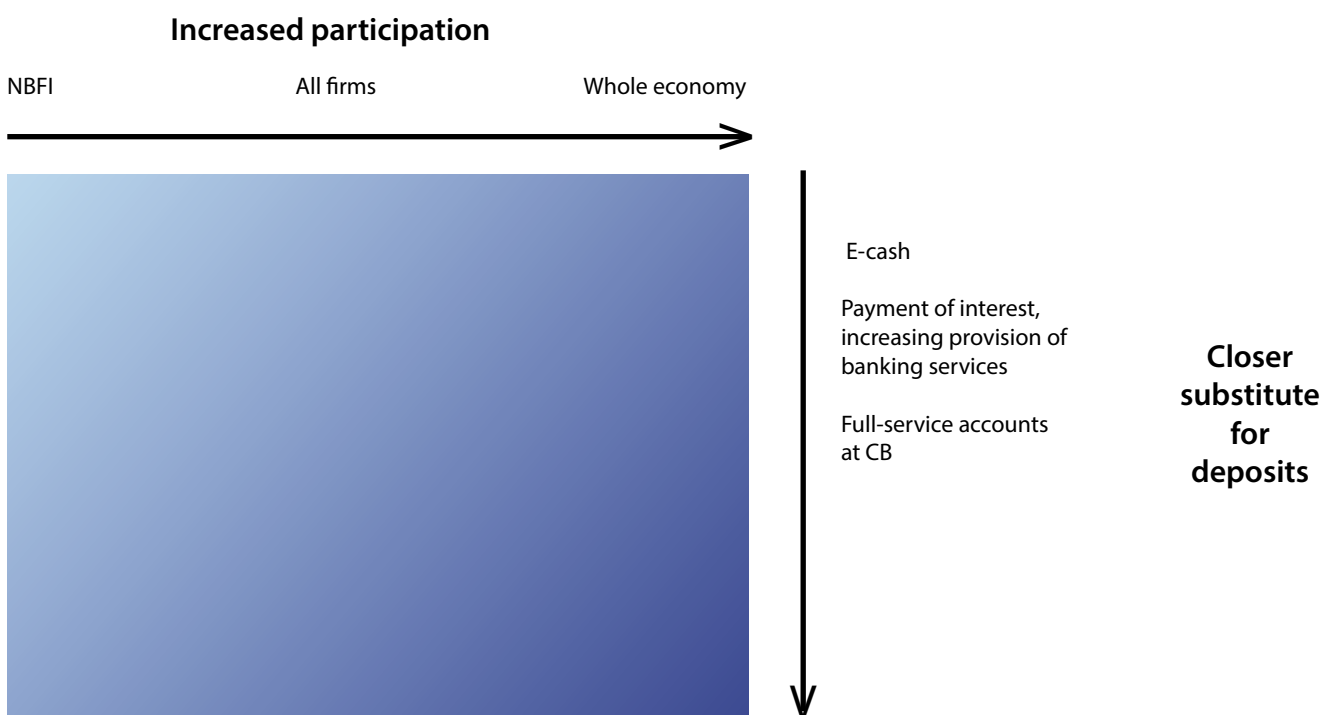
The case for narrow banks has a long and distinguished pedigree. The classical economists Adam Smith and David Ricardo favoured such a system. Famously, during the Great Depression, a group of economists at the University of Chicago recommended the end of fractional reserve banking (the so-called ‘Chicago Plan’). There have been similar calls since the 2008-09 financial crisis<sup>11</sup>.

Proponents of narrow banking have generally argued it should be imposed by regulatory fiat, rather than via some sort of nationalisation of deposit-taking by the central bank. An exception is a 1987 essay by the economist James Tobin<sup>12</sup>. To avoid relying too heavily on deposit insurance to protect the payments system, Tobin argued, the government should create what he called “*deposited currency accounts*” (DCAs) at the central bank. “*I think the government should make available to the public a medium with the convenience of deposits and the safety of currency, essentially currency on deposit, transferable in any amount by check or other order.*”

There are two interesting points about Tobin’s proposal. One is that he made it long before anything like the ‘distributed ledger’ was conceived (he suggested that DCA branches could be housed in post offices). Another is that he fell short of suggesting the wholesale nationalisation of deposit-taking: he thought there should still be room for commercial banks to raise deposits of their own and that they should continue to be insured<sup>13</sup>.

One reason is that draining deposits from commercial banks is unlikely to be costless. In particular – and this is the potential catch with too widespread a CBDC – it might threaten their lending activity. If banks cannot use deposits for that purpose, how would their lending then be financed? And without a supply of bank credit, how would the real economy, in particular the part of it that cannot easily access securities markets, itself be funded?

**Chart 5. CBDC important when it competes with existing deposits**





There is no easy answer to these questions. As far as the non-financial economy is concerned, it's clear it would be hard seamlessly to replace bank loans with securities issuance. There are good reasons why it's difficult for young firms, in particular, with little invested capital, to sell shares or bonds<sup>14</sup>. The same goes for households. If bank lending became scarcer, or more expensive, it's likely that investment and economic activity would suffer.

Furthermore, several economists argue that there's a degree of complementarity between making loans, on the one hand, and issuing liquid liabilities on the other<sup>15</sup>. If so, you'd naturally expect to find the same institutions doing both – banks don't exist in the form they do simply because we've partially insured their liabilities. And, at least to a degree, competing away their deposits would compromise banks' ability to supply credit, or at least make it more expensive<sup>16</sup>.

It might also make that supply more variable. With an easily available alternative, banks' remaining deposits would more readily migrate to the CBDC during times of stress. (It would certainly be more straightforward than stuffing cash under the proverbial mattress<sup>17</sup>.) Nor has the alternative source of funding the banks – raising debt in wholesale markets – proved that stable in the past. In fact, one striking feature of the financial crisis was that banks' wholesale debt proved

much less stable than deposits. That's why regulators have since recommended that banks actually raise the share of (non-equity) funding that comes from deposits<sup>18</sup>.

It's hard to know how significant these effects would be. And, as I tried to explain earlier, a CBDC that sought simply to replicate cash would probably have a greater impact on the demand for banknotes than on commercial bank deposits, with more limited macroeconomic effects. If the central bank's balance sheet were opened up only to non-bank financial companies, and no wider, the issue probably wouldn't arise to begin with.

But as you widen that access, and the more closely a CBDC substitutes for existing deposits – ie. the further towards the south-east you move across (the extremely stylised) Chart 5 – the more prominent the issue becomes. No longer would a CBDC be a purely technical decision, about the costs and security of exchanging money. It would become more a matter of prudential policy, not to say the fundamental structure of the financial system.

### **Conclusion**

The word 'digital' has become so ubiquitous that its meaning isn't always clear. The word seems to get tacked on to just about anything, no matter how tenuous its connection with

computers, simply in order to convey an appealing sense of the modern. A brief search – on the internet, appropriately enough – reveals advertisements for a course in ‘digital humanities’, opportunities in ‘digital agriculture’ and even something called ‘digital parenting’, whatever that is. (If it means having to ask your 11-year-old son what’s gone wrong with the computer then I would certainly qualify as a ‘digital parent’).

Whether or not ‘digital currency’ is the right way to describe something like bitcoin, or its central bank counterpart, is also unclear. A better term for the underlying technology, the distributed ledger, might be ‘decentralised virtual clearinghouse and asset register’. But there’s no denying the technology is novel. Prospectively, it offers an entirely new way of exchanging and holding assets, including money.

It’s an irony, therefore, that some of the economic questions it raises have actually been around for a long time, for as long as economics itself. Some admirers of bitcoin see it as a means of bypassing central banks altogether. They are in some ways the descendants of the supporters of ‘free banking’ in the 19<sup>th</sup> century. Conversely, others see the distributed ledger as an opportunity for the central bank to expand its role, via

a ‘central bank digital currency’ available to a much wider group of counterparties. If it were a close substitute for bank deposits, a CBDC would represent a shift towards a ‘narrower’ banking system. This too is an old debate in economics: should banks be prevented from creating liquidity, or is maturity transformation an inevitable and necessary feature of market economies?

I’m certainly not attempting to enter that debate. It’s in the nature of long-standing questions that the answers aren’t obvious. What I do want to do, however, is to point out that it is a relevant question – that the introduction of a CBDC probably involves more than a narrow, technical judgement about the efficiency of the payments system, very important though that is.

What’s also clear is that we have a lot more thinking to do. That’s why the issue of digital currencies forms an important part of our *One Bank Research Agenda*<sup>19</sup>. It’s also why, in publishing the *Agenda* a year ago, we asked for help, hoping to encourage ‘the wider academic community’ to think about the big policy questions. So, let me re-iterate that request: all contributions welcome! ■

1. I’m thinking here of things like direct debits, or the capacity to receive our monthly pay.
2. According to Coinbase, around 20% of bitcoin transactions – worth \$25 billion in total – were for retail purposes.
3. From 1997 total money holdings in the UK are given by notes and coin in circulation with the non-bank public plus the sum of households’, PNFCS ‘and non-intermediate OFCs’ deposits (M4x). Prior to 1997 total money holdings are given by total M4 excluding repos and other short-term paper.
4. New currencies have sometimes been introduced by executive decision and in an orderly way. The most obvious example is the euro. But when currency substitution has occurred naturally it’s almost always done so only after the incumbent currency has been debauched by hyperinflation.
5. Walport (2016).
6. Autonomous Research (2016).
7. Banks can also transfer resources by buying and selling their own short-term debt in the ‘money market’, but ultimate settlement is made by exchanging central bank reserves.
8. Carney (2013).
9. Nor is it a live issue for the Bank. As the Governor recently said to the House of Commons’ Treasury Committee, “May I...be absolutely clear: there are no plans to abolish cash at the Bank of England”.
10. The Bank of England’s balance sheet has obviously grown following QE. Those operations have been conducted via the Asset Purchase Facility (APF), which is not directly on the Bank’s balance sheet – strictly speaking, the blue bar in Chart 4 is not direct holdings of gilts but a loan from the Bank to the APF. But the APF itself holds only gilts and, even before QE, the vast majority of assets on the Bank’s balance sheet were government securities.
11. Ricardo, writing at a time when money was held largely as physical cash, argued the note issue should be separated and protected from commercial lending (Ricardo (1823)). The specific proposal in the Chicago Plan was 100% reserve requirements on demand deposits of commercial banks (Simons et al., (1933)). The post-crisis case has been put by Pennachi (2012) and, amongst others, by Martin Wolf of the FT (Wolf (2014)). Lainà (2015) describes how calls for full-reserve banking tend to intensify after financial crises. Bossoni (2001) provides a useful overview of the literature on narrow banking and comes to a more sceptical conclusion. A longer-term perspective on the debate is provided by Goodhart and Jensen (2015).
12. Tobin (1987); there are echoes of this proposal in the more recent work of Barrdear and Kulmhof (2016).
13. Under his proposal, however, deposit-taking banks would be ‘ring-fenced’ from providing investment-banking services. Even so, commercial bank deposits would have to offer more attractive terms – in particular a higher rate of interest – than the DCAs. One implication is that, if the appropriate spread between the interest rate paid on commercial and central bank deposits were to widen during times of banking stress – and one imagines it would – the central bank would more often run up against the zero lower bound.
14. See, for example, Diamond (1984); a useful summary can also be found in Freixas (2008).
15. Kashyap et al. (2002) point out that there are technological similarities between holding deposits and making advances: both involve expertise in liquidity management. Diamond and Rajan (2001) go further, arguing that, given imperfect information on the part of depositors about the riskiness of individual loans on a bank’s balance sheet, the risk of a run is a necessary discipline on the bank.
16. If maturity transformation is a necessary feature of a market economy, you’d probably expect to find the private sector creating an alternative supply of liquid assets of its own, to help replace lost deposits. This would mitigate the impact on lending but it would also undermine any prudential benefits of a part-nationalised deposit-taking system (eg. Goodhart and Jensen (2015)).
17. Other than cash, the easiest way for individuals to shift exposure away from commercial banks and towards the safer public-sector balance sheet is to put money into National Savings and Investment certificates (NS&I). Flows into NS&I picked up markedly during the crisis (NS&I (2009)).
18. The difference between loans and deposits – the so-called ‘funding gap’ – has shrunk dramatically in recent years. Overall, the significant regulatory reforms since the crisis – in particular ring-fencing, the insistence on more equity and other loss-absorbing forms of funding and, on the assets side, higher holdings of liquid instruments – will have lowered materially the degree of maturity transformation within the banking system (see, for example, Lowe (2015)).
19. Bank of England (2015); see, in particular, section 5 “Response to fundamental change”.

This article is based on a speech given at the London School of Economics on 2 March 2016

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# How the blockchain enables a new economy

This crypto economy will transfigure businesses, government and our society, perhaps even more profoundly than the internet did, says William Mougayar

**W**hat started as Bitcoin, a model cryptocurrency that captured the imagination of many, is metamorphosing into something bigger: a 'crypto-tech' driven economy with unparalleled global value creation opportunities, not unlike the Web's own economy.

Welcome to the crypto economy.

Contrary to what is seemingly visible today, this crypto economy will not be born by attempting to take over the current financial services system, nor by waiting for consumers to transfer money into cryptocurrency wallets; rather it will emerge by creating its own wealth, via new types of services and businesses that extend beyond money transactions.

The crypto economy is the next phase of the internet's evolution: the decentralization era. Its genesis is Bitcoin's backbone technology: the 'blockchain', a key concept that has entered our technophilic vocabulary, but with applicability reach outside of just Bitcoin.

At its core, the blockchain is a technology that permanently records transactions in a way that cannot be later erased but can only be sequentially updated, in essence keeping a never-ending historical trail. Blockchains also enable assets and value to be exchanged, providing a new, speedy rail for moving value of all kinds without unnecessary intermediaries.

This seemingly simple functional description has gargantuan implications. It is making us rethink the old ways of creating transactions, storing data, and moving assets, and that's only the beginning.

This 'value exchange' modus operandi is the spark of a domino effect in innovation, unseen yet since the advent of the Web.

To understand how cryptocurrencies are leading us into this new frontier, we need to go back and question the meaning of money, then combine those answers with an understanding of the powers of the blockchain.

What is money?

Money is a form of value. But not all value is money. We could argue that value has a higher hierarchy than money. In the digital realm, a cryptocurrency is the perfect digital money. The blockchain is a perfect exchange platform for digital value,

and it rides on the internet, the largest connected network on the planet. The resulting combustion is spectacular: digital value that can move fast, freely, efficiently, and cheaply. That is why we have called the blockchain a new 'value exchange' network.

Cryptocurrency, because of its programmability aspects, embodies digital information that can enable other capabilities. When you 'pay' via cryptocurrency, that transaction could also include additional trust-related rights, such as for property, information, custody, access, or voting.

But money is not the only form of value that the blockchain could move. The genie is out of the bottle: what if the blockchain could move any digital asset? What if you could take any legally binding construct like identity, ownership, contracts, or rights, and attach it in a unique, unforgeable, and auditable way to the blockchain's cryptographically secured ledger; then you open the path to millions of usage scenarios that gain wings by being tied on the blockchain. Going one step further, imagine a world of multiple blockchains, not just one; and we end-up with a huge overlay network of decentralized services that are open and accessible to anyone.



Therefore, the blockchain enables a new form of meta-transaction where the value is represented by what it unlocks at the end of the transaction, not just by an intrinsic monetary value that gets deposited in a static account. It sounds like a type of stock market functionality that allows the trading of an unlimited number of unregulated value elements, unlike financial securities that are regulated. And, it is more distributed, more decentralized, and more active in the sense that your 'wallet' can trigger actions that are directly wired into the real world.

How do we get there?

With most enabling technologies, we typically begin by duplicating old habits, often by doing the same processes faster or cheaper. Then we start to innovate by doing things differently, and by applying new ideas that we couldn't implement before. That's how the internet took off as soon as we started to program it with 'Web applications', and it is precisely the path that the crypto-tech revolution is on.

If Bitcoin (or any cryptocurrency) is programmable money, the blockchain is also programmable value, programmable governance, programmable contracts, programmable ownership, programmable trust, programmable rights, programmable assets, and more.

This gets us to the next nugget in this emerging puzzle: how do we create new value?

You create value by running services on the blockchain.

Buckminster Fuller once said: *"You never change things by fighting the existing reality. To change something, build a new model that makes the existing model obsolete."* He is right.

That is exactly what is happening. Bitcoin and cryptocurrencies will succeed; not by mounting frontal attacks on the current financial system, nor by seeking permissions from regulators and gatekeepers. Rather, change will start to happen by

*"This crypto economy is the newest phase of the internet, and it will unravel and blossom over the next 10 years"*

creating a parallel system that will get stronger and grow on its own over time.

What are the several ways to create this new value in the new cryptospace?

There is a precedent in what already happened in the cyberspace. With the internet, we had e-commerce, e-business, e-services, e-markets. Later, the social web arrived with large-scale social networks, and the mobile web scooped over 3 billion global users. Each one of these segments created its own wealth by existing on the internet.

In the cryptospace, we will see a number of emerging businesses that will run on the blockchains, and they will generate a new source of natively earned wealth:

1) Services where a trust component can be stored on the blockchain. Since the blockchain acts as a verifiable and auditable place where transactions are really difficult to get tampered with, what if you could bind your digital assets to the blockchain, in essence finger printing your ownership (or rights) in irrevocable ways without the need for a central registration authority? Expect the following foundations to be disrupted: identity, rights, membership, ownership, voting, data ownership, time stamping, and content/services attributions.

2) Services where a contractual component can be executed on the blockchain. Also known as 'smart contracts', a term first popularized by Nick Szabo,



these are small programs that can run on a blockchain and self-govern legal or contractual terms between various parties, without the need for intermediaries. They represent a simple form of decentralized trust. Why depend on a central authority when two (or more) parties can agree between themselves, and bake the terms, compliance and implications of their agreement programmatically? Applications areas being targeted include: wagers, family trusts, escrow, time stamping, proofs of work delivery, bounties, proof of bets, proof of compliance.

3) Decentralized peer-to-peer marketplaces. These represent an evolution from what we see today in the most successful marketplaces (ie. Uber, eBay, Amazon), but they actually threaten to replace some of these existing players. In a decentralized peer-to-peer marketplace, anyone can sell and anyone can buy, while the centre controls less, but facilitates more. Trust, rules, identity, reputation, and payment choices are embedded at the peer level. Participants arrive already trusted, and 'decentrally' acknowledged. The blockchain acts as the trusted virtual intermediary that checks rules, identity, reputation, payment choices. OpenBazaar (p2p ecommerce) and LaZooz (p2p ride sharing) are some examples.

4) Distributed Autonomous Organizations (DAO) whose governance and operations run on the blockchain. Arguably, this is the epitome of business decentralization. A DAO issues its own cryptocurrency, a process called 'crypto equity'. Members are also 'workers', and by virtue of their collective actions and activity levels, they contribute to increasing value for the DAO. Some examples of user actions could include sharing their computing power or internet access (eg. to create mesh networks), donating data they own, delivering on bounties, and other schemes that are germane to the type of vertical segment being targeted, such as transportation or health care.

The above four sectors represent 'decentralized applications', an emergent segment of web software development. What they all have in common is that they run on a blockchain, can multiply and grow without central control, and they are fueled by cryptocurrency that powers the transactions and computer power they run on. The cryptocurrency is like fuel; it's collected in part as toll, in part as earnout by the participating users and those that provide these services. So you can start to see how cryptocurrency is generated out of crypto-services to instigate a new economy of wealth creation.

Once that happens, there will be a critical mass of users with significant cryptocurrency balances in their accounts. Only then, can we attempt to potentially make dents into the current financial system, and in the nation-currency sovereign government paradigm.

The reality is that it's very likely that the financial systems and governments will be the last bastions to be affected, and not the first ones.

What the blockchain enables is a new 'flow of value', a concept related to economics Nobel laureate Michael Spence's work on how digital technologies transform global value chains via the dynamics of information flows. The blockchain is another digital value leveller as it impacts and shifts value in the cryptospace. The blockchain moves the power of transactions closer to the individuals, and it empowers any user to align themselves with a decentralized application or organization, and start generating or moving their own nucleus of crypto value. A side benefit of this phenomenon is to put the sharing economy on steroids, as it melds (crypto) capital and labor with mobile, location-agnostic marketplace environments.

As we prepare to get on-board the crypto economy, undoubtedly it looks fuzzy, foggy, buggy, risky, uncertain and unproven, but so did the internet in 1995. Then suddenly, it blossomed and grew into our lives, businesses, and it infiltrated society and culture, with more benefits than vices.

We are in the early stages of understanding the movement, distribution and creation of 'value' outside of the traditional norms of currency, commodity and property as the main vehicles for value transfer and appreciation. Soon, this new frontier will appear.

The blockchain symbolizes a shift in power from the centres to the edges of the networks. This is a vision that we may have romanced since the early days of the internet, but it can actually happen this time, because it is powered by an intrinsic monetary value, the internet's own native cryptocurrency.

Existing intermediaries will be at risk. And new intermediaries will be more virtual, transparent, and distributed entities that are trusted programmatically.

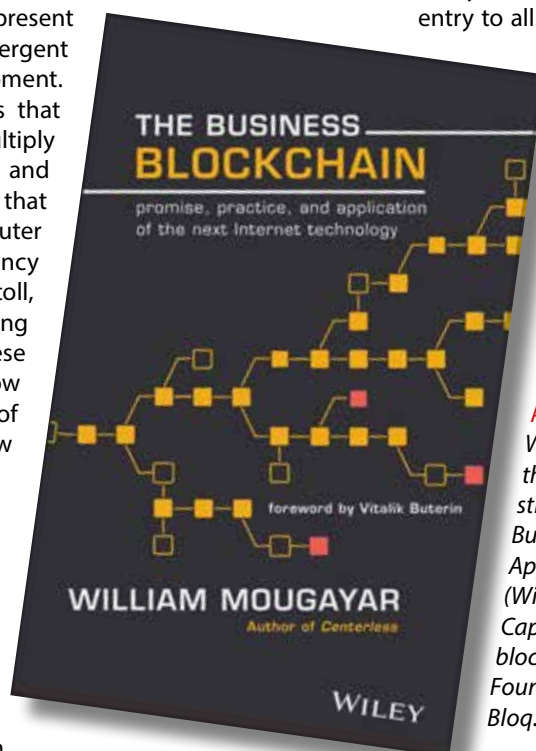
This crypto economy is decentralized at birth, - politically and architecturally; and it lends equal access and lower barriers of entry to all. Anyone will be able to 'work' for a DAO without permission, and therefore will generate their own wealth.

This crypto economy will transfigure businesses, government and our society, perhaps even more profoundly than the internet did, 20 years ago.

This crypto economy is the newest phase of the internet, and it will unravel and blossom over the next 10 years. ■

#### ABOUT THE AUTHOR

*William Mougayar is a globally recognized thought leader and advisor on blockchain strategy, and the best-selling author of The Business Blockchain: Promise, Practice and Application of the Next Internet Technology (Wiley, 2016). He is General Partner at Virtual Capital Ventures, and on the boards of leading blockchain organizations, such as the Ethereum Foundation, the Coin Center, OpenBazaar, and Bloq.*





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# Going digital: the benefits of a digital organization in financial services



Alejandro Gonzalez is a Partner and Pedro Fernández is Principal at Arthur D Little

**R**ecent cases in which we have participated have shown that the organization of digital efforts is a key and controversial aspect of every digital transformation. Channels, clients, IT and other departments often think that digitalization is their natural field of play, and that they must keep ownership of the process. Traditional channels, product areas and other 'business-as-usual' departments sometimes see digitalization as more of a threat than an opportunity, and their lack of involvement and commitment is a real danger to the outcome of the transformation.

To have everybody on board and guarantee that the digital transformation takes place, the organization in charge of it has to have the proper tools, authority, interphases and liaisons to compose an adequate governance model. Furthermore, since the role of IT is critical to most digital initiatives, the role of an IT organization must be reviewed thoroughly in order to guarantee that the systems become enablers, not roadblocks, for the transformation progress.

## Becoming digital centric is a must

Digital transformation has changed the world. The ubiquity of the internet and the extremely rapid expansion of increasingly versatile smartphones have disrupted the way consumers interact with several industries. As mentioned in our recent digital transformation study, from entertainment to the car industry, almost no sector of the economy has been left out of the digitalization wave.

Financial services are not an exception. The way customers interact with banks and insurance companies has changed: according to Eurostat and The Financial Brand, as much as 40% of banking customers in the EU are active online banking users. That number rises to 61% in the US. We expect this number to rise to 83%–89% in the EU by 2020.

What we expect from financial institutions has also changed. Brick-and-mortar institutions are becoming obsolete quickly. According to a survey among European youngsters, 70% would rather go to the dentist than visit a bank branch. Today we do most of our transactions online (In Spain, 65% of online transactions versus 35% offline for the average online user, estimated for 2015), but most of our purchasing offline (75%). However, that is likely to change in the future.

In this scenario, banks and insurance companies that are able to transform themselves will be better prepared to ride the digitalization wave. However, the truth is that most companies remain unprepared. According to a 2015 pan-

European survey by Arthur D Little, financial institutions are less adapted to digitalization than the cross-industry average. Although most companies have undergone considerable investments in order to update their IT capabilities and architecture, other key functional aspects are lagging behind, organization being one of the most critical ones.

Adapting the organization for digitalization is critical for several reasons. Some of the most important are:

- A common digital direction is needed. Digital transformation often means an explosion of uncoordinated and often duplicated efforts, with different departments working in different directions;



therefore, a strategy and common steering schemes must be laid down. Furthermore, digital must be integrated within the company strategy as a whole.

- The digital environment is quickly evolving, and traditional decision-making is often too slow.
- Most digital projects have heavy IT components. Thus, digital leaders on the 'business side' must interact constantly with leaders from the 'IT side'. The business side must be proficient in IT themes, and vice versa.

### **Companies define and implement digital with different organization setups**

Our experience reveals that most companies do not have clear strategies on how to organize digitalization. Results from an internal European survey reveal that 73% of companies rely on top management to define digital strategy – a correct approach, in our opinion, but then implementation is developed by top management in one-third of all companies, which is wrong by all measures. Only 18% of companies rely on central digital organizations to implement their strategies, 36% having it delegated to specific departments. (The most common are IT and clients). Most surprisingly, 14% of all companies have no clear guidelines about who designs or implements the strategy.

So, who is right? Setting aside those who rely on top management to implement the strategy and those who do not have strategies at all, distributed implementation responsibilities are more common than a central department, by a 2:1 ratio. Does this mean that distributed is better?

*“... banks and insurance companies that are able to transform themselves will be better prepared to ride the digitalization wave”*

### **Implementing digitalization—chief digital officer versus decentralized digitalization**

Digitalization affects many different aspects of the organization: processes are to be changed, product definitions to be rethought, operative and commercial channels to be affected. Responsibility over those functions is often spread through the organization.

Therefore, any digital transformation plan must coordinate different areas and teams, each one working with its own point of view and agenda. When implementing the plan, two main options arise:

- Chief digital officer (CDO): setting up a central organization under a CDO, who is accountable for all digital projects in the organization, with a digital budget, resources and responsibility over main digital transformation KPIs
- Decentralized digital functions: distributing key digital functions (defining digital processes, fine-tuning



digital channels, adapting products to the digital world, new ventures) among the traditional owners of those functions

Both options have advantages and disadvantages, and these must be weighed when deciding which one is optimal.

Generally speaking, a CDO and a digital department are better for steering a common strategy. Decision-making is easier, there is more agility and initiatives are better coordinated. Also, responsibilities are clearer, KPIs easier to follow and objectives simpler to set. It also is a better option to ensure adoption of agile methodologies in the organization and change management towards a digital culture in general that facilitates interaction with IT leaders.

On the other hand, distributing functions also has several advantages: the implementation is done closer to the line of business, and the business priorities are therefore easier to harmonize with the digital strategy. Secondly, the particularities of different BUs are better taken into account. Thirdly, authority is easier to build, and the 'we-know-best' argument can be better avoided.

In any case, if the company is to go with the CDO, everybody involved should be aware that it is to be, by definition, an interim solution, available only as long as the company is transforming. The aim of the digital department should be to transform the aspects that ought to be changed and then quickly transfer those functions to the line of business. A CDO who wishes to preserve his job rather than transform the company would be a hindrance to digital transformation.

Traditionally, financial institutions have understood the digital market as an independent one, and thus have undertaken digitalization through the development of offshoot digital companies. In developed markets such as the UK and Spain, many of the top-10 insurers have followed this approach.

Our opinion on this strategy is that this was good enough in the past, but is not advisable anymore. The virtue of this tactic used to lie in the fact that you could test digital technology and the digital market without having to radically transform the parent company or cannibalize your own clients. This is not the issue any longer (digital technology is well tested and the digital market is not a niche anymore, but the mainstream of clients), and it has considerable drawbacks, such as duplicate investments and lack of digital adaptation within the parent company.

### **The new roles in a digital organization**

As we have stated, in a bank or insurer, the objective of digitalization is to transform the core of operations and processes. The outcome of the transformation should not be the growth of digital functions in parallel to core functions (ie. digital channels versus traditional channels), but to transform current functions so they are adapted to digitalization (strengthening BI, channels, product areas, etc.). However, it is also a fact that radically new digital functions arise because of digitalization. For these, new capabilities must be developed or acquired. It is important to have a coherent plan for this, as 'letting things happen by themselves' will not work. Examples of important new roles are:

- Chief data officer: data becomes critical because of digitalization. Organizations must ensure its quality and availability. Data leaks are another new key item that this role must take care of.
- Customer experience and omni-channel specialist.
- Digital innovator and digital radar.

### **What is the role of IT? Leader or follower?**

It is a common mistake to associate digitalization with IT. IT is undoubtedly a critical enabler of digitalization, but there is much more to digitalization than having the technology. The business point of view is critical when defining digital channels, customer interactions, products and even internal processes. All along the way of digital transformation, IT must play a very active role because most of these aspects to be defined will impact the technological architecture or technical components that must be assessed. IT must then play a role as a facilitator and guide the company towards innovative technical solutions that help achieve defined goals.

### **Implications on IT**

Although as stated before, IT should not be the leader of the digital transformation, it is one of the areas in which the impact of the transformation will be heaviest. In order to deal with the changes needed, the traditional way of working has to be changed:

- *A more agile approach is fundamental:* digitalization means the speed of change of everything increases. Client expectations change faster, products must be adapted more quickly. If an organization wants to remain up to date, it must reduce the time to market for all solutions. This, in turn, has implications on IT. A typical waterfall-like IT project spanning 18 months is not adequate. In the digital world, an 18-month-old idea will probably be obsolete by the time it hits the streets. Agile development of projects, micro-segmentation of deliveries, etc., are better suited to digital transformation.
- *A dedicated organization is advisable...:* a very specific skill set is needed for the implementation of digital projects – ie. big data, omni-channel specialists, etc. Therefore, IT resources specializing in digital projects is a good idea in order to increase efficiency and build a team of IT specialists who then can act as focal points – or internal consultants – for all digital projects. Also, a separate demand management scheme for digital only must be developed.
- *...but with a flexible arrangement:* the amount of IT effort needed for digital projects will vary over time. A common pool of resources between the digital and non-digital projects should be set up as a buffer for these variations in IT demand.
- *Network of specialized providers:* not all traditional IT providers are suited for digitalization projects – creating a pool of specialized providers is advisable.

Digital transformation is one of the most important changes that the financial industry faces these days. This transformation radically changes how banks and insurance companies interact with their clients, what products are offered, how they operate internally, and where and how value is created. In order to prepare for this landslide transformation, companies must adapt their organizations to facilitate change. ■

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- Petr Jezek, Chair of the European Parliaments Delegation for Relations with Japan
- Julian Wilson, Director for Japan at the European External Action Service
- Luis Simon, Professor at the Vrije Universiteit Brussel

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# Cybersafety and cybersecurity – priorities for Bermuda

Online safety is important to Bermuda at the individual and organisational level. To support both, the Department of E-Commerce within the Ministry of Economic Development has cultivated many partnerships in the public, private and third sector as they all find synergies to deliver their common online safety message more effectively.

## Cybersafety

Cybersafety, which is defined as the safe use of the internet, and related internet matters are a priority for the Government of Bermuda. In May 2008, legislation was passed that promoted online safety and promulgated anti-child pornography and internet luring laws. The Cybertips initiative was then launched to provide information and resources about internet safety to parents, children and the public.

Ever since then, the mandate of Cybertips has been to arm the local community with tools and resources in the fight for cybersafety. Led by the Department of E-Commerce, Cybertips has enlisted partners from the profit and non-profit sectors, public and private, including the Bermuda Police Service and other committed community representatives. All are dedicated to furthering Bermuda's cybersafety goals.

Cybertips has been hard at work enhancing its team, programme, and website, which is a resource to various stakeholders including the Island's students, teachers, parents, and senior citizens. The Cybertips team has also been actively reaching into the community, conducting weekly visits to multiple schools and engaging students and teachers in thinking more deliberately about -and adopting- safer internet practices and good digital citizenship. This outreach has touched a record number of students at their schools, in addition to numerous Parent-Teacher Association (PTA) visits and community organisation gatherings.

The website ([www.cybertips.bm](http://www.cybertips.bm)) is a resource for students, parents and guardians, teachers, parent-teacher associations, and youth organizations across the Island. Its content is obtained from a variety of leading sources including the Microsoft Corporation in order to ensure that it provides current and useful information. The website also includes a link to report abuse anonymously, which goes directly to the Bermuda Police Service, to the Department of Child and Family Services, or to Crimestoppers, depending on the nature of the reporter's concern.

Through the many avenues that it uses to reach its stakeholders, Cybertips strives to provide practical tips, resources and contact information to help, inform, and encourage the safe use of the internet so that all can be on guard against online predators and inappropriate content. In a time when children are able to talk to strangers from all over the world from the comfort of their own homes or via their mobile devices, Cybertips is more important than ever.

## Cybersecurity

Individuals, businesses and other organisations consider the security of their data to be of critical importance. In addition, individuals rely on the organisations in which they have entrusted their data to have sufficient protective measures in place to prevent a non-authorized third party from gaining access to that data. The Bermuda Government's Department



of E-Commerce is therefore striving to bolster the country's cybersecurity awareness and preparedness through organizational partnerships.

For instance, the Business Technology Division of the Bermuda Chamber of Commerce and the Bermuda Chapter of the Information Systems Audit and Control Association (ISACA) once again partnered under the TECHTALK banner to present current and emerging technology trends that may have an impact on or are useful to businesses on the Island.

TECHTALK aims to promote information technology-related knowledge and educational initiatives in Bermuda. The initiative hosts regular information sessions which are open to the public and attract IT, risk, accounting and business



professionals as well as students who are interested in these disciplines. Topics discussed recently have included fraud and fraud incidents, cyber-incident response, data management and security, and information management.

On 20<sup>th</sup> April 2016, ISACA Bermuda hosted a cyber-incident response simulation workshop. This workshop was designed to take participants through various critical stages in the typical timeline of incident response: the immediate aftermath of a data breach, the subsequent 24-48 hours, and the long-term, post-emergency remediation.

At the helm of the simulation were two senior members of Deloitte's cyber security team. They led the workshop as a tabletop exercise to emphasize the need for group discussion and collaboration. To encourage full audience participation, the attendees were divided into tables of eight people. Each table worked as a team to handle a cyber-event at their own (fictitious) organization.

The participants were distributed fairly evenly by job role so that each table consisted of people with different job functions and professional backgrounds. This mirrored the real-world scenario of a team of stakeholders at any organization, who would bring different skillsets to the table, and who would have different insights as to how the cyber-incident would affect their business processes. This, in turn, would give visibility into how people in various job roles would prioritize the organization's assets, processes and risk approach.

The scenario was framed as follows: a new CISO at Acme Insurance shares that she saw a list of user names and passwords, customer data, and credit card details posted on the dark web that claimed to be information exfiltrated from Acme's internal records.

The participants were asked to discuss what the organization's immediate response should be in the first hour after this security breach was reported. The consensus was to immediately verify the facts: that a breach had indeed

*“The Bermuda Government’s Department of E-Commerce ... supports and promotes cybersecurity and cybersafety as an overarching framework within which technology can be used in a way that maximises its benefits and keeps its users safe and their information secure”*

occurred and that the data on the dark web was indeed exfiltrated from the organization. The follow-through was to determine if the breach was still ongoing. If it was, the next step was to lock down the security holes to mitigate the effects of the incident.

The incident handling was not limited to the IT Security team: other organizational units would also have critical roles in the incident response efforts. It was agreed to include –as a bare minimum–:

- The corporate communications team, to deliver a unified message internally to customers and to the public at large. The message would be appropriately worded and targeted to each audience.
- The legal team, to determine the liability and exposure of the organization, which would in turn dictate the level of disclosure that would be permitted to the corporate team, and indeed all employees.
- Overall, the SERT (Security Emergency Response Team), to ensure that the cyber-incident is addressed at the highest levels of the organization – including at the board and C-Suite levels.

The workshop delivered a fairly accurate experience of the confusion and anxiety that an unprepared organization would have to soldier through during a serious incident. The simulation demonstrated that the response would require the participation of many organizational units, not just the IT or information security teams, across hierarchical levels. Importantly, the prime takeaway was that preparation was indispensable and that prior training was key.

The above are two simple example of how the Bermuda Government's Department of E-Commerce conducts its multi-pronged, multi-faceted approach as it supports and promotes cybersecurity and cybersafety as an overarching framework within which technology can be used in a way that maximises its benefits and keeps its users safe and their information secure. ■

# Trade matters for jobs and growth

Since the end of World War II, broad consensus in support of global economic integration as a force for peace and prosperity has been a pillar of the international order. Early multilateral trade agreements reduced trade barriers from high levels in the early post-war years and established global trading rules that allowed trade to flourish in the age of globalization. These broad, multilateral agreements—now overseen by the World Trade Organization—also played a central role in keeping protectionist responses to economic shocks broadly in check.

In short, global and regional trade agreements, coupled with technological changes, have enabled international commerce to drive the fastest rise in global living standards at any point in history.

Yet a revolt against global trade integration is under way in many of the world's largest economies with claims abound that new trade agreements are simply tools to support big business at the expense of society as a whole.

In the United States, the leading presidential candidates on the campaign trail are united in their opposition to global trade—and in particular the newly inked Trans-Pacific

Partnership agreement, while in Europe there is growing public opposition to new trade deals.

Meanwhile global coverage of trade liberalization in the media demonstrates a growing negative bias with the story going something like this: international trade is bad news for workers, destroys local communities and degrades our planet.

Worryingly, we are seeing signs that anti-trade rhetoric is already translating into definitive policy choices. According to the Global Trade Alert initiative, 2015 saw the biggest rise in protectionist activity since the onset of the financial crisis—with world trade showing sharp drops in those sectors which have been hit hardest by trade barriers.

But is it any wonder that public opinion on trade is souring in many countries around the world when it would seem that no one is speaking up for the benefits of international commerce?

Yes, there is scope for positive change to enable trade to better serve the needs of families across the world. While the global trading system is by no means perfect, the time has come to stand up for the global and set the record straight

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**“ The WTO’s Trade Facilitation Agreement must be a core component of the G20 agenda for inclusive growth. Implementing this landmark agreement would enable many SMEs to export for the first time.”**

**TERRY MCGRAW**  
Chairman  
International Chamber of Commerce



on trade. Any debate on the role of trade in today's economy must be balanced and evidence-based. So let's hear more talk about why trade matters; how the gains from trade are realized; how trade can drive sustainable development; and about how concerns about trade's disruptions can best be handled.

Policies based on myth, hearsay or political hyperbole are best left alone. Take protectionism: sheltering industries from global competition might sound like a good idea, but evidence shows that it creates real hardship in the long-run.

Trade agreements aren't designed to support or help individual businesses, but rather to support growth and development of economies as a whole. They are, simply put, an exchange of market access between governments: a levelling of the playing field in one market in exchange for a levelling in another.

In recent years a growing focus has been placed by policymakers on enabling trade for sustainable development. In 2001, governments launched the WTO's Doha Development Agenda—talks which in 2013 yielded the landmark Trade Facilitation Agreement which it estimated could create more than 18 million jobs in developing and least-developed countries. Recent bilateral agreements—such as the Trans-Pacific Partnership—also contain important provisions to uphold labour standards and promote environmental protection.

It's important to remember trade agreements are not just about economics: they can be an important component of a country's broader foreign policy too. The creation of the first multilateral trade framework played a critical part in restoring peaceful international relations following World War II. Today, bilateral and regional agreements give developed countries a tool to support political and economic reforms in emerging markets.

In response to concerns from civil society, governments have also taken steps to enhance the transparency of trade

*“So let's hear more talk about why trade matters; how the gains from trade are realized; how trade can drive sustainable development; and about how concerns about trade's disruptions can best be handled”*

negotiations. To take just one example: the European Commission last year outlined new steps to increase public access to documents from its on-going trade talks with third-countries.

In 2016, growth in the volume of world trade is expected to remain sluggish at 2.8%; the fifth consecutive year of trade growth below 3%. The slowdown comes at a time when the international community has identified trade as an important component for achieving the United Nation's Sustainable Development Goals.

However, there remain significant opportunities to boost trade for the benefit of all—particularly through new global initiatives under the WTO. The International Chamber of Commerce is supporting global efforts for instance to streamline customs and border procedures, liberalize trade in green technologies and enhance the supply of finance for small businesses looking to trade internationally.

Urgent action is needed to restore the growth of global trade starting with some clear reasoning on why trade matters for jobs, for growth, for all. ■

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# EU-China FTA: why do we need it? How should it look like? What will it bring?

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In developing its international trade strategy since 2006, the EU has placed a strong emphasis on concluding Free Trade Agreements (FTAs) with dynamic East Asian economies. Until very recently, however, no explicit mention has been made of China – the region's largest and most dynamic economy – as a possible candidate for a FTA with the EU.

Indeed, in March 2014, President Xi Jinping suggested to jointly explore this possibility during his visit in Europe. The request was taken seriously by the EU only in 2016 when, Commissioner Malmström however affirmed that the Commission expects a successful conclusion of current bilateral investments agreement and would like to see significant progress in the Chinese domestic reform process before starting any potential talks on a FTA.

EU-China economic relations are nowadays dominated by discussions on whether China will be granted market economy status (MES) in anti-dumping (and anti-subsidy) procedures. The controversy is based on the ambiguity of Art. 15 of the WTO accession protocol for China, agreed 15 years ago and due to expire at the end of the year. Although the granting of MES would be confined to anti-dumping procedures and would only specify how the EU can set anti-dumping and countervailing duties in the event that China is found to have engaged in dumping, the debate has been broadened to judge whether China is a market economy or not in more general terms.

In this framework, CEPS and World Trade Institute (WTI) in Bern tried to sketch the architecture of a possible FTA between the two trade giants, dealing with three principal aspects: why we need an FTA, how to design it and which economic impact can have<sup>1</sup>.

## Why and EU-China FTA?

The rationale behind can be based on five arguments. First of all, the economic potential of EU-China trade and investment relations is far greater than what has proven possible until now despite impressive growth of bilateral trade and investment in the recent past. The US dollar value of total bilateral goods trade since 1995 has increased by a factor of ten, reaching some \$600 billion in 2014. Services trade is strongly rising (to over \$70 billion in 2014) over the past decade or so, despite restrictions in some sectors and the adverse effects of the crisis.

The balance in goods trade leans heavily in China's favour, if only because barriers on the EU side are lower than the relevant ones in China for goods that EU companies specialise in. The trade balance in goods hovers around a \$200-plus

billion deficit for the EU ever since the crisis began (\$230 billion in 2014); in services, the EU has a surplus, which recently climbed rapidly to some \$12 billion in 2014.

Secondly, a reason for the FTA may consist in the assurance of market access that is at least as good as is available with other relevant trading partners; otherwise, the competitive positions of EU and Chinese companies vis-à-vis companies from other trading partners may be damaged temporarily or permanently. In fact, beside the expected higher Chinese protection on the overall economy, the EU face serious prohibitive international peaks in competitive sectors for member states such as electrical machinery, various machinery and vehicles which are subjected to duty rates above 25%, 35% or even 45% in some cases.

The same happens in the agro-food sector where Chinese imports of PAPs, Meat and Beverages (in which the EU has strong comparative advantages) are subjected to international peak ranging between 20-35%. If industrial goods are crucial due to the amount of value traded, the agro-food sector entails a big opportunity for European firms to exploit a growing and immense market which is changing its diet towards a higher consumption of meat as wages increase.

A third argument for a EU-China FTA is the emergence of 'mega-regionals', among them TPP, TTIP, the negotiations of Regional Comprehensive Economic Partnership (RCEP) that increased the incentives for China to turn to its largest trade and major FDI partner – the European Union – to improve market access and deepen investment relations.

A fourth case can be found in the interest for China to boost domestic reforms in China, crucial to becoming a well-functioning, developed market economy and escaping the 'middle-income trap', and the exposure to foreign goods and services competition as well as more widespread FDI in all sectors.

Finally, an EU-China FTA can also be considered for strategic and 'geo-political reasons'. China might be disappointed in Asia-Pacific Economic Cooperation (APEC), as the group is now split for the time being between a TPP club of twelve and the other APEC members, most of which are in RCEP. China's cooperation with the BRICs is also not doing too well lately, and the One-Belt-One-Road initiative and the Asian Infrastructure Investment Bank (AIIB) are only in the very early stages at best. With respect to the US, China might eventually join TPP, but this is not certain at the moment and a China-US FTA seems hard to imagine politically (at least in the US).

### How should an EU- China FTA look like?

The Chinese economy is trying to move away from a productivity growth mainly stimulated by a model of mass production based on low-skilled assembly and extreme export-led growth in such products. To move up in the global value chain, higher productivity growth is required, together with more and higher-quality services. In this respect, a stronger trade cooperation with the EU would be fundamental to boost the economy out of its original path.

A deep and comprehensive free trade agreement between EU and China should follow the classical framework envisaged by EU trade policy in the new generation of FTAs mainly based on removal of non-tariffs measures. Figure 1 sketches the nine blocks that must be negotiated: besides the removal of tariffs line on industrial goods and agro-foods (items 1 and 2), considerable work on Technical Barriers to Trade and problems on food, animal feed and animal products (items 3 and 4), cross-border provision of services and foreign direct investment (item 5) represent crucial chapters since those segments are extremely complicated or severely restricted to foreign investors in China.

There is no doubt that a pre-requisite for the EU to engage in 'deep and comprehensive' trade talks is to see significant progresses in Chinese reforms process. Indeed, since 2013, the Chinese authorities have regularly announced the intensification of the country's reform process. If one would take these pronouncements literally, the difficult transition further away from the old planned economy to a market-driven one, with the state solely in a role as legislator, supervisor and enforcer, would signal decisive progress for China itself, but also for the EU and other trade partners.

In actual practice, reforms are difficult to implement and slower than what China maybe foresaw, if one only understood that China was reigned under absolute Communism with a socioeconomic order structured around the state/collective ownership when certain trade instruments, such as public procurement, intellectual property rights (IPR) protection, competition policies were redundant. China established all these trade instruments from scratch triggered by the

*"Pursuing a free trade agreement with China could be a logical continuation of the EU trade policy strategy"*

country's accession to the WTO in 2001 and is viewed as a cause accelerated domestic reforms.

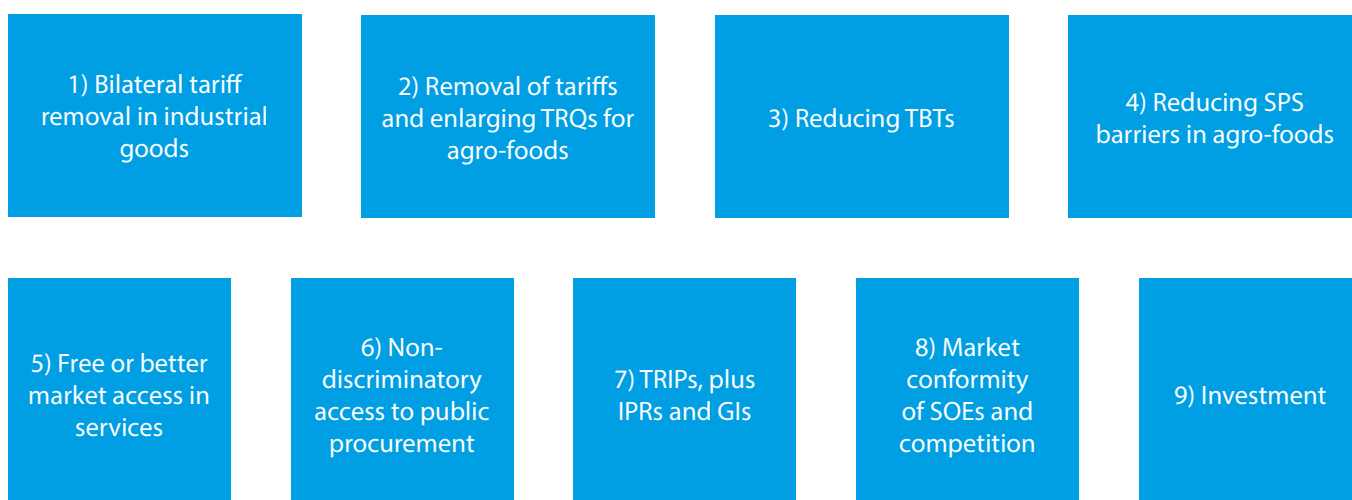
China's public procurement (item 6) regime was established around the time of China's WTO accession which is, nonetheless, less related to market access, but a device for budgetary control. Public procurement rules will kick in if fiscal funds are used. Moreover, since the regime serves as a policy driver, as a campaign against extravagant and wasteful spending, it encourages domestic purchase of goods, works and services which may be translated as 'buy China'.

Building on this premise, one may understand the 'clash of ideologies' between China and its WTO counterparts for the country's accession to the WTO Government Procurement Agreement (GPA) which aims to open government procurement markets among its parties based on reciprocity. With so far six GPA offers submitted since December 2007, and despite the extensive concessions that China has made in relation to, among others, widened entities and lowered thresholds of goods, services and works, these offers have not been accepted as sufficient for the purpose.

Ostensibly, state-owned enterprises (SOEs) as well as their activities are not offered as covered entities. The direction of EU-China negotiations on public procurement under an FTA would likely follow a GPA+ approach, given EU's position of 'deep and comprehensive' FTAs. This process will be facilitated if China would accede to the GPA.

China's IPR system (item 7) has barely a 30-year history. It was established as a component of the country's overall

Figure 1. A potential EU-China FTA in nine blocks



Source: Pelkmans et al. (2016)

modernisation campaign in the wake of the devastating Cultural Revolution in the late 1970s, since IPR protection is a prerequisite for importing foreign advanced technologies. Indeed, China demonstrated its sheer audacity when it pledged to provide IPR protection based on laws and international practice by virtue of Art. VI of the Agreement on Trade Relations between the United States of America and the People's Republic of China (Beijing, 7 July 1979), when the IPR system did not exist in China at all, neither an effective judicial system.

The Trademark Law was first promulgated in 1982, Patent Law 1984, and Copyrights Law in 1991. Thirty years down the road, though having achieved spectacular success in IPR legislation, China is still persistently confronted with the challenges of weaker IPR enforcement. Issues hampering EU-China bilateral trade include administrative enforcement, patent linkage, and admissibility of supplementary data for pharmaceutical product patent applications, enforcement on trade secret theft and ownership of copyrights.

Presumably, the EU and China should be able to reach an IPR agreement in an FTA, because the IPR chapter in China's two most recent FTAs concluded with Korea and Australia, respectively, are ambitious. It is simply in the country's own interest to strengthen IPR enforcement and extend it in the context of bilateral trade.

Within the remit of the overall EU-China dialogue on IPR protection, the EU is currently negotiating with China a bilateral agreement on the protection of geographical indications (GIs) (item 7), aiming at providing protection in China of a first list of EU GIs with 100 names for agricultural products, including dairy and meat products, and vice versa. Once concluded, it will provide as a more solid base for both sides to take the next step forward in their FTA negotiations on the topic.

China, a latecomer of GIs protection, is handicapped by fragmented registration and protection systems, which are often embroiled in disputes among different interest groups of businesses. Presently, China is EU's top five GIs export country (agricultural products, foodstuffs, wines and spirits) and the world's fourth largest importer of food and the food and grocery retail market is set to grow by 15% annually.

The youngest brother of the above-mentioned three trade instruments that China established from scratch in recent years is competition policy (item 8), although it is increasingly the 'must visit' jurisdiction for global mergers alongside the EU and the US. By virtue of Art. 2 of the Anti-Monopoly Law (AML) 2008, monopolistic operations which have eliminative or restrictive effects on competition in China's domestic market may be subject to AML's scrutiny. China's competition policy attracts much controversy because of enforcement practices, including lack of transparency and procedural impartiality; lack of information on AML infringement, as well as the procedural steps and possible consequences if found guilty of AML infringement. Judicial review relating to the AML has yet to be developed further.

Reflecting on the FTAs concluded by China on competition policy, it so far fell short of commitment on 'specific subsidies', subsidies which would be legal only under certain conditions since blanket and unlimited subsidies are prohibited by the EU in its FTAs. This aspect is highly sensitive as it directly links

to China's ambiguous position towards unconditional and substantial subsidies granted to SOEs since, after all, by virtue of Art. 7 of the AML, the SOEs do not seem to be subject to AML's scrutiny.

The privileged status of China's State-Owned Enterprises (item 8), in the form of preferential government treatment in policy and funds, as one may glimpse through the AML, somehow withstands the sweeping SOEs reforms staged in the past three decades aimed at reorganisation, corporatisation and privatisation.

Some of the Chinese SOEs have since grown to be the world's top corporations, such as SINOPEC, China National Petroleum Corporation and State Grid. Nowadays, SOEs remain a source of frictions between China and its trading partners whose businesses in China simply have no level-playing field vis-à-vis the SOEs with regard to market access, public procurement and the [non-]application of competition policy. There can be no doubt that to negotiate an FTA between the EU and China, the considerable distortions caused by the SOEs would have to be dealt with satisfactorily. In other words, the SOEs must be confined to market-oriented behaviour while government intervention eradicated.

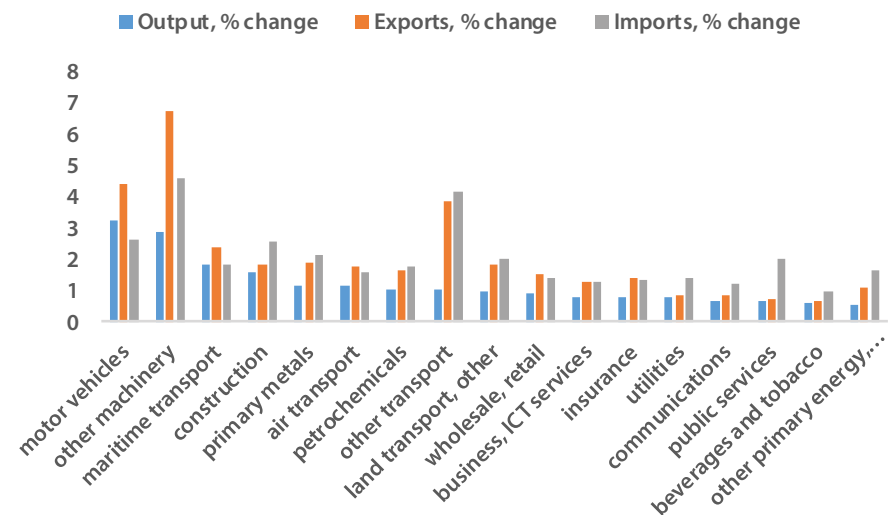
By the same token, market access for the EU businesses in China is a major issue for both sides to settle before the on-going negotiations of the Comprehensive Agreement on Investment (CAI) (item 9) may be concluded with good outcomes. At the moment, foreign investment is impeded by the far-reaching restrictions on business entry and operation appeared in many Chinese services and goods markets, especially those predominated by the SOEs; while national treatment as well as the most-favoured-nation treatment are not effectively granted to foreign businesses. The OECD 2014 FDI Restrictiveness Index (for 28 of the 58 countries, all non-EU countries) reveal that China's bans and restrictions add up to an even higher index than notoriously difficult cases such as Saudi Arabia and Myanmar, and also far higher than the index for other BRICs.

### **Which economic impact we should expect?**

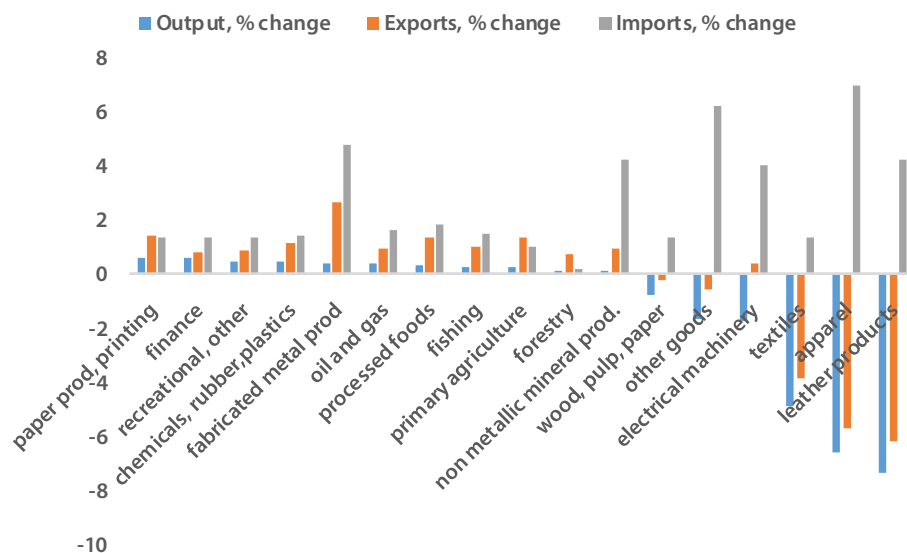
A sensitive question on a potential FTA with China concerns the economic gains that the initiative could guarantee in the long run. The economic impact is provided with respect to the effect on GDP of the EU and China, and of all the EU member states, as well as the effects on industrial and services sectors' output and bilateral trade. The second effect that creates an animated debate concerns labour issues and labour adjustments across skills and wage levels. The econometric adopted technique, the Computable General Equilibrium Model, has several weaknesses, among them the impossibility to have unemployment figures and not to take into account the effects on investments (which tends to underestimate the overall results). It represents however the state-of-the-art in policy circles to evaluate impacts of FTA.

In the stylised scenario, a deep and comprehensive FTA is defined as full bilateral tariff removal and 50% reduction in the costs of regulatory barriers on goods markets and also 50% reduction in the costs of regulatory barriers in services markets. According to the estimations, the EU-China FTA is simulated to affect GDP positively: it will be (by 2030) 1.87% higher in China and 0.76% higher in the EU. Because EU income is higher overall, the outcomes in money terms are more balanced; \$99.7 billion for China and \$93.2 billion for

**Figure 2.**  
**(a) FTA effects on EU output, exports and imports (changes by sectors, ambitious scenario)**



**(b)**



Source: Pelkmans et al. (2016) Authors' calculations

the EU in the ambitious case. Effects on GDP are EU averages ranging from 0.47% for Portugal to 1.97% for Slovakia. Overall, all EU member states gain somewhat even if at sectoral levels, someone may lose. Figure 2 (a) and (b) show changes in output, exports and imports in EU in the sectors analysed.

Labour displacement at sectorial level followed by contraction in the domestic production of some sectors (in Europe for instance see textile, apparel and leather products) would be indeed difficult to avoid but its effect can be mitigated and/or anticipated. Indeed, workers do anticipate, especially in vulnerable sectors, competitive threats and might (and do) seek to work elsewhere.

The same is true for companies that can not only relocate towards lower-wage countries (even inside the EU) or exit from the market but can seek to upgrade their product

portfolio, thereby reducing their vulnerability vis-à-vis China by investing in innovative products and training. The remaining labour displacement due to the FTA should be properly addressed by explicit and clear policy action. Active labour market policies' at domestic level are required, whether in the form of (effective) re-training, upskilling, or job search support.

Pursuing a free trade agreement with China could be a logical continuation of the EU trade policy strategy. The study shows that the economic potential in bilateral trade could be significant and has probably been underestimated due to the lack of investments effects in the model. However, constructive trade talks can only start after China makes significant process in the implementation of its reforms, not least by committing to reform SOEs and opening up public procurement. ■

1. Pelkmans, J. et al (2016) 'Tomorrow's Silk Road: assessing an EU-China Free Trade Agreement'.  
<https://www.ceps.eu/publications/tomorrow-s-silk-road-assessing-eu-china-free-trade-agreement>



# Modi 2.0: revisiting relationship capitalism

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The second half of the twentieth century saw remarkable swings of the pendulum in the perceptions about the process of economic development in independent India. During the 1950s India somewhat became a path setter, if not a role model. For some, India's mixed economic system under Nehru became an answer to the challenge posed by communism in China and the Soviet Union. For others, India's journey was a unique non-capitalist path to development. While India may have been on the road then to caricature itself as an ideal social democracy and a welfare state, twenty-five years later, ie. by mid 1970s, such perceptions turned upside down. Slow growth and high level of poverty represented failure on part of the state.

Another twenty-five years down the road, ie. from early 2000s, we witnessed another dramatic change in India's politico-economic story where the strengthening of political, economic and social institutions from the adoption of pro-market policies (starting since the late 1980s), secured impressive economic growth performance for India.

Under the leadership of Narendra Modi, India in the last two years has attempted to achieve a persistent rate of higher economic growth in a process to achieve a more equitable, sustainable economic development. In this piece I analyze the operational style of the current government's economic governance and examine some evidence on its level of integration with the rest of the world (evident from an analysis on trends in FDI-foreign direct investment and OFDI-outward foreign direct investment).

In a book written in 2004, Raghuram Rajan and Luigi Zingales explained how free markets—perhaps the most beneficial economic institution known to humankind—rest often on fragile political foundations. The book, *Saving Capitalism from the Capitalists*<sup>1</sup>, argues how bureaucrats and politicians who make decisions guide the invisible hand of the market. In the first few decades after World War II, state managed competition, which Rajan and Zingales referred to as 'relationship capitalism', seemed to work quite well in continental Europe and Japan.

In a politically stable environment, both continental Europe and Japan experienced high rates of growth under a state-managed competitive system. However, as explained by Rajan and Zingales in their book, growth in these economies during the postwar decades concealed three serious problems:

- i) the relationship system failed to encourage innovation across major sectors driving production;
- ii) with the market suppressed, there was no allocative mechanism for monopoly profits to be adequately distributed;
- and iii) the system failed to acknowledge constructive destruction where the sick, government-controlled/ owned units could die out to give way to new/sunrise industries.

In India, during the last two years Modi's government seems to have taken similar steps to 'manage' capitalistic forces through a number of reforms and policy initiatives—to mixed



results (under the stated expectation of launching measures such as the Clean India campaign, the Smart Cities proposal, the Skill India initiative etc.-highlighted below). Though most policy initiatives have relevance, the journey from policy proposal to implementation seems misplaced due to the limited (cap)abilities of Indian states; lacking both the political will and financial resources to implement some of these policy initiatives to fruition.

There is a degree of over-centralization associated with the Prime Minister's Office (PMO), which appears more presidential (as in the American political machinery) than federalist, which is germane to the Indian political economy framework. The fate of the Goods & Services Tax (GST) Bill, Bankruptcy Reform Bill, and the Companies Amendment Bill<sup>2</sup> echo the Modi government's political failure in passing key reform bills. In a recent article<sup>3</sup>, I've discussed how this political limitation has arisen due to institutional challenges (present at the legislative, executive, and judicial level). These have made progressive economic governance a challenge.

Let's now examine the evidence on the Indian economy's integration with the rest of world that is usually measured by the performance in trade (via exports) and investment (via FDI and OFDI). While the performance in trade levels has been quite weak due to the fall in global commodity prices and overall aggregate demand, we can look at the current foreign investment situation in India.

### The Foreign Direct Investment push

To strengthen India's position in the global economic landscape, the current government's focus in the last two years has been skewed towards attracting foreign direct investment across a number of sectors. Launched in September 2014, the Make in India program has resulted in a number of foreign enterprises investing in sectors such as defence manufacturing, automobiles, aviation, media and entertainment, electronic systems, bio-technology, food processing, and mining.

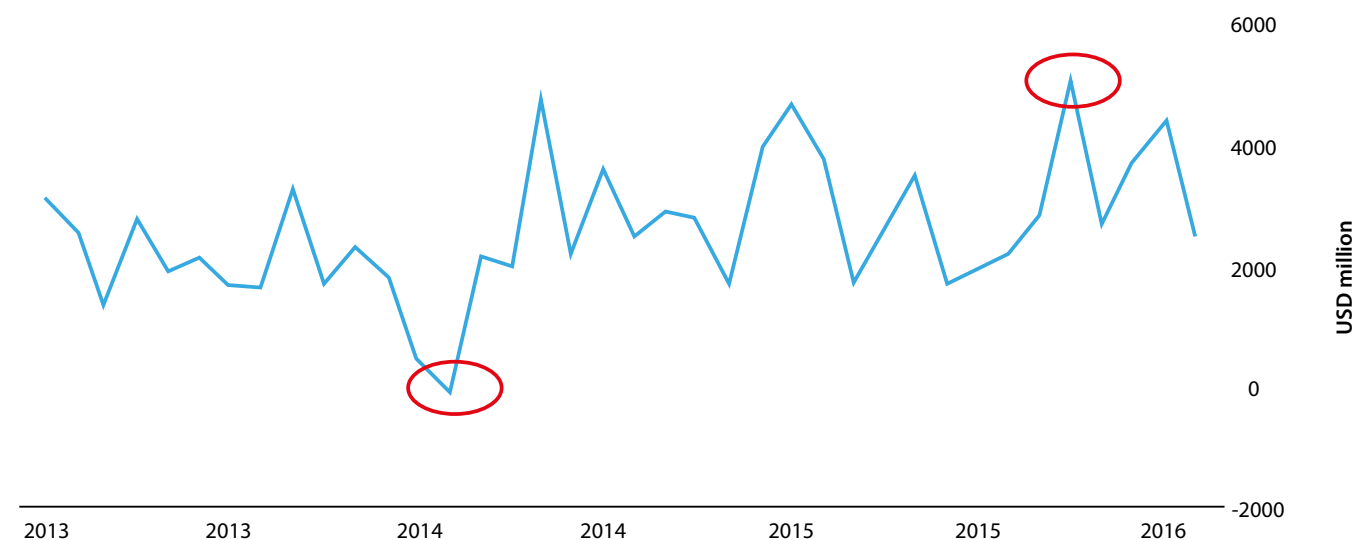
*"One of the key challenges for the government will be to ensure that real wages... remain sustainably at a higher level across both urban and rural areas, while the Indian economy seeks to become the next factory of the world"*

Over the last two years, there has been more than 48 percent growth in FDI equity inflows<sup>4</sup> and 37 percent in overall FDI inflows<sup>5</sup>. This is pleasant news considering the fact that level of foreign direct investment was at its lowest in February 2014 (as shown in Figure 1).

This has largely been made possible by a string of policy measures enacted to ease regulatory and procedural formalities in setting up and running a business. The improvement in ease of doing business<sup>7</sup> has been complimented by an array of policy initiatives as exemplified by Skill India, Digital India, Start-Up India, Smart Cities, Atal Mission for Rejuvenation & Urban Transformation (AMRUT), to name a few. These initiatives have aimed to lay the foundation for the next wave of investment and growth through a massive infrastructure push.

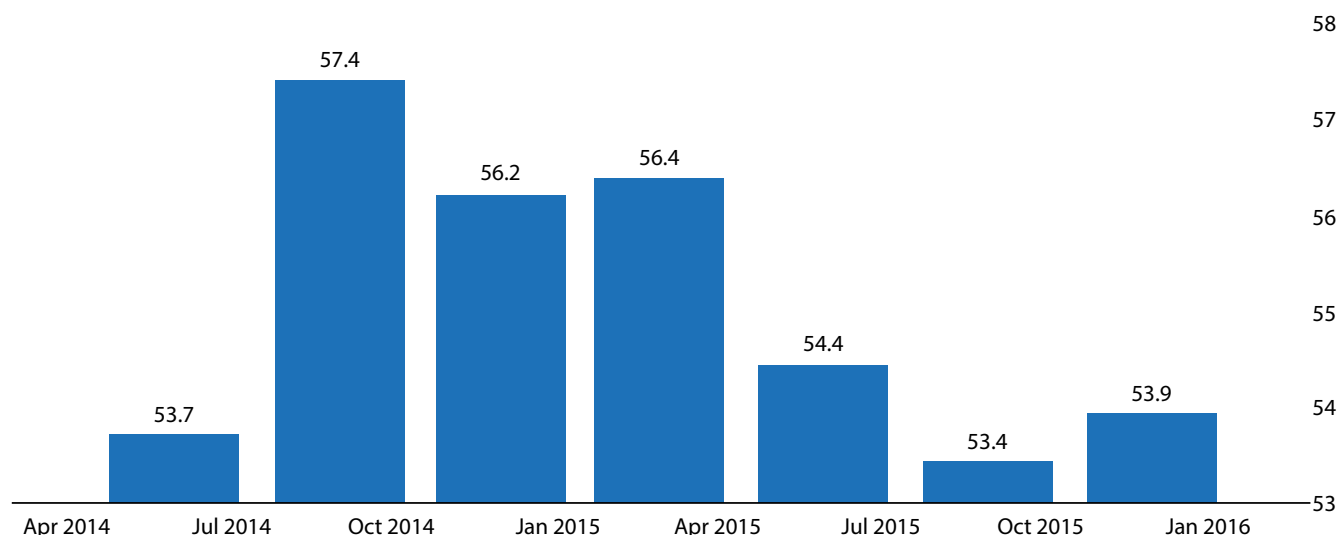
One of the key challenges for the government will be to ensure that real wages similar to growth levels in India also remain sustainably at a higher level across both urban and rural areas, while the Indian economy seeks to become the next factory of the world. Lessons from the economic history<sup>8</sup> of East Asian economies like Japan and China show how a state-led development model in a relationship capitalistic set up may lead to the formation of an export-led manufacturing bubble in the long run.

**Figure 1. Foreign Direct Investment (2014-2016)**



Source: Reserve Bank of India database (Trading Economics)<sup>6</sup>

**Figure 2. India's Business Confidence Index**



Source: Confederation of Indian Industry (CII) data (Trading Economics)<sup>10</sup>

**The increasing Outward Foreign Direct Investment (OFDI) trend**

India's big businesses as well as small- and medium-scale enterprises have received continuous support from government-controlled finance plans. However, if we observe domestic industrial performance levels and the business confidence index, performance seems to be quite weak or underutilized due to both internal and external (what I call as endogenous and exogenous<sup>9</sup>) factors.

While India continues to attract foreign investment into critical sectors, its own businesses are stagnating in their domestic performance and looking for opportunities to invest abroad/off-shore. This perceptible shift in Overseas Foreign Direct Investment (OFDI) and Overseas Investment Destination (ODI) in the last few years is an interesting trend. While most of the Indian investment went to resource-rich countries such as Australia, United Arab Emirates, and Sudan earlier, the trend over the last two years points to a big push towards countries providing higher tax benefits such as Mauritius, Singapore, the Netherlands, and the British Virgin Islands.

Most Indian firms have invested there through Mergers and Acquisitions (M&As) transactions, where the expectation is that these companies will get access to better technologies and more extensive markets, which will enable them to cater to a global consumer base. As per a recent estimate<sup>11</sup>, "M&A activity increased in 2014 with deals worth US\$38.1 billion, compared to US\$28.2 billion in 2013 and US\$35.4 billion in 2012.

*There have been M&A deals worth US\$28.8 billion in the first 10 months of 2015."*

**The challenges ahead**

In the years to come it remains to be seen if the Indian economy on a whole continues to perform better under Modi and whether the government can gradually make an effort to move away from the relationship capitalistic system in letting the markets freely compete across sectors, and if improved coordination can be established with the states on areas of policy implementation? It would be prudent for the government to focus more on promoting greater economic and financial freedom to states and local level political institutions.

Real prosperity can come from the ability of the Indian economy to grow an export-led manufacturing or via service-led sectors, through more trade and investment, ensuring that growth transforms as one of the means by itself to achieving equitable, sustainable economic development. The current government at the same time must do away with its obsession with increasing FDI as an answer to all economic/financial woes and promote economic development by focusing more on enhancing access to quality education (at a primary level) and primary healthcare as the foremost means for communities/societies to get the opportunity to develop. The focus on driving greater investment from/to abroad must be complimented by socially investing this capital for long term returns. ■

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2. <http://www.prsindia.org/uploads/media/Companies,%202016/Companies%20bill,%202016.pdf>
3. <http://southasianvoices.org/2016-a-test-for-indias-democratic-institutional-capabilities/>
4. [https://drive.google.com/file/d/0B-Tv7\\_upCKANSjB1YTAyMWhWOUU/view?pref=2&pli=1](https://drive.google.com/file/d/0B-Tv7_upCKANSjB1YTAyMWhWOUU/view?pref=2&pli=1)
5. <http://www.thequint.com/hot-wire/2016/04/27/pm-narendra-modis-make-in-india-pushed-fdi-higher-by-37-govt>
6. <http://www.tradingeconomics.com/india/foreign-direct-investment>
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10. <http://www.tradingeconomics.com/india/business-confidence>
11. <http://www.ibef.org/economy/indian-investments-abroad>



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# PYRAMID VS. OCEANIC CIRCLES FACILITATING SUB-REGIONAL TRADE FOR SUSTAINABLE DEVELOPMENT



**Bipul Chatterjee is Executive Director and Susan Mathew is a Senior Programme Officer at CUTS International**

## Introduction

On 22<sup>nd</sup> April 2016, India's Ambassador to the WTO Anjali Prasad handed over the instrument of acceptance for the WTO Trade Facilitation Agreement (TFA) to the WTO Director-General Roberto Azevêdo. Agreed at the WTO's 2013 Bali Ministerial Conference, the TFA would ease the cross-border trade in goods. Among many other potential benefits, the agreement would enable India to expedite movement of goods and establish cooperation between customs and other authorities on customs compliance issues (WTO, 2016).

It took approximately two and half years for India to ratify the agreement. And India was just the 76<sup>th</sup> member out of 162 member states in the WTO to accept the TFA. The TFA will enter into force only once two-thirds of the WTO membership has formally accepted the agreement.

On the other hand, following the 18<sup>th</sup> Summit of the South Asian Association for Regional Cooperation (SAARC) held in Kathmandu, Nepal in November 2014, a renewed focus was initiated to promote sub-regional connectivity *"through SAARC or outside it, among all of us or some of us."* So, on June 15, 2015, the Bangladesh-Bhutan-India-Nepal Motor Vehicle Agreement (BBIN MVA) was signed in Thimphu, Bhutan by the transport Ministers of the four South Asian countries.

The *World Trade Report 2015* contemplates that the WTO TFA has the potential to increase global merchandise exports by up to \$1 trillion per annum. On the other hand, the joint statement of the BBIN MVA claimed that transforming transport corridors into economic corridors could potentially boost intra-regional trade within South Asia by almost 60 per cent and with the rest of the world by more than 30 per cent.

Given that devising and reaching a consensus for a multilateral agreement would require almost five times more resources compared to what a sub-regional agreement would entail, this article attempts to deliberate why South Asia needs to adopt an oceanic circle model vis-à-vis pyramid model for facilitating trade with sub-regional sustainable development as a focus.

The 'new trade' theoretical models developed in late 1970s and early 1980s depended heavily on the demand-side economies of scale. A country's export by default was another country's imports and if the country's exports were at a steadily constant rate then the country's imports would correspond to the returns to scale. It indicated that identical

preferences in demand also generate more trade between countries.

The result was the formation of an economy where a few trading countries formed the base for key trade mandates and other countries follow—similar to a pyramid with a base country supporting numerous smaller national economies. So, in case of a crisis, the base country often incurred almost none to minor repercussions while the smaller national economies crumbled or folded with maximum losses.

The new era of sub-regional trade and connectivity of regional markets through 'growth triangles' challenges such pyramids. A primary reason behind the success of initiatives like BBIN<sup>1</sup>, BIMSTEC<sup>2</sup>, BCIM<sup>3</sup>, BCIN<sup>4</sup>, SASEC<sup>5</sup> and SIJORI<sup>6</sup> is that they do not function as regional trade agreements per se but provide a regulatory circumference to enable policy environments. They are connected in figurative sense as oceanic circles so that a ripple in one part of the regulatory circumference enables the rest of the circles in the ocean to adapt and make space for future policy reforms.

The flow is not transferred; rather it is shared equally among the sub-region. In case of a backflow, the respective country absorbs it as a minor ripple, so the bigger the country, the higher its chances to create positive ripples or absorb the backflows. The reconfiguration of regulations to suit national and local requirements has shown success in the South Asian context. The next question that arises is how to scale up the policy environment to accommodate a sustainable link among the individual countries.

## Insights from BBIN

The BBIN group of countries have a key factor which can support as well as undermine South Asian trade – land connectivity. The four countries have significant overlapping interests in terms of geography too, since they are part of the Trimurti<sup>7</sup> – Indus, Ganges and Brahmaputra river basins, hence the key livelihood options revolve around agriculture and water. Therefore, the success of seamless trade connectivity among BBIN countries would also contribute to local economic development. The majority of commodities used as raw materials for agriculture and industrial purposes in the BBIN countries are transacted through land and water transport services. Table 1 enumerates the transport services across land, water and air for BBIN countries from 2010-2013. Other than Nepal, which recorded a negative balance of trade

in all the relevant transport services, all the other countries in BBIN have recorded a positive balance of trade in some transport services. The data also reveals that all the sections of BPM6 classification showed evidence of transaction across land and water (UN, 2010).

A closer look at the products commercialised by BBIN reveal that cereals have the highest positive balance of trade after textiles and pharmaceuticals and mineral fuels, oils, distillation products, etc. have the highest negative balance of trade. Table 2 shows the product categories within cereals and mineral oils and allied products which have shown positive balance of trade. This indicates that key products like rice and electrical energy show potential in being transacted within the BBIN group of countries.

Figure 1 depicts the balance of trade for three categories in terms of trade deficit and trade surplus for the BBIN nations with respect to the SAARC aggregation. The figure shows that BBIN nations have a positive balance for cereals in the SAARC aggregation with India leading. Transport and the mineral fuels etc. category have a trade gap with maximum negative balance in India followed by Bangladesh. It is interesting to note that Nepal and Bhutan have a low negative balance of trade in all three categories. The results indicate the low transaction for these commodities in the two countries as

*“... countries need to replace ‘bureaucratic diplomacy’ with ‘economic diplomacy’... benefit regional trade for sustainable development”*

compared to other SAARC countries. A reflection of the different data discussed above can be seen at the field level, too.

In absolute terms, data shows that India has a 76 per cent export value and Bangladesh has 60 percent import value for cereal seeds (Mathew, 2015). For example, there is a high rate of informal trade in cereals seeds and grains across the Indo-Bangla border which also indirectly contributes towards ensuring food security for these countries (USAID/EAT Project, 2014).

#### **Scaling up of the policy environment**

The BBIN MVA was not only a timely intervention given the present political buy-in for sub-regional economic



**Table 1. BPM6 Code & Service label of transport services with positive balance of trade in BBIN averaged from 2010-2013**

Bangladesh	Bhutan	India	Nepal
▶ 3a.3-Other transport (other than passenger and freight), All modes (alternative breakdown)	▶ 3a.1-Passenger transport, All modes (alternative breakdown) ▶ 3.2-Air transport ▶ 3.4-Postal and courier services	▶ 3a.2-Freight transport, All modes (alternative breakdown) ▶ 3.3-Other modes of transport (other than sea and air)	-None

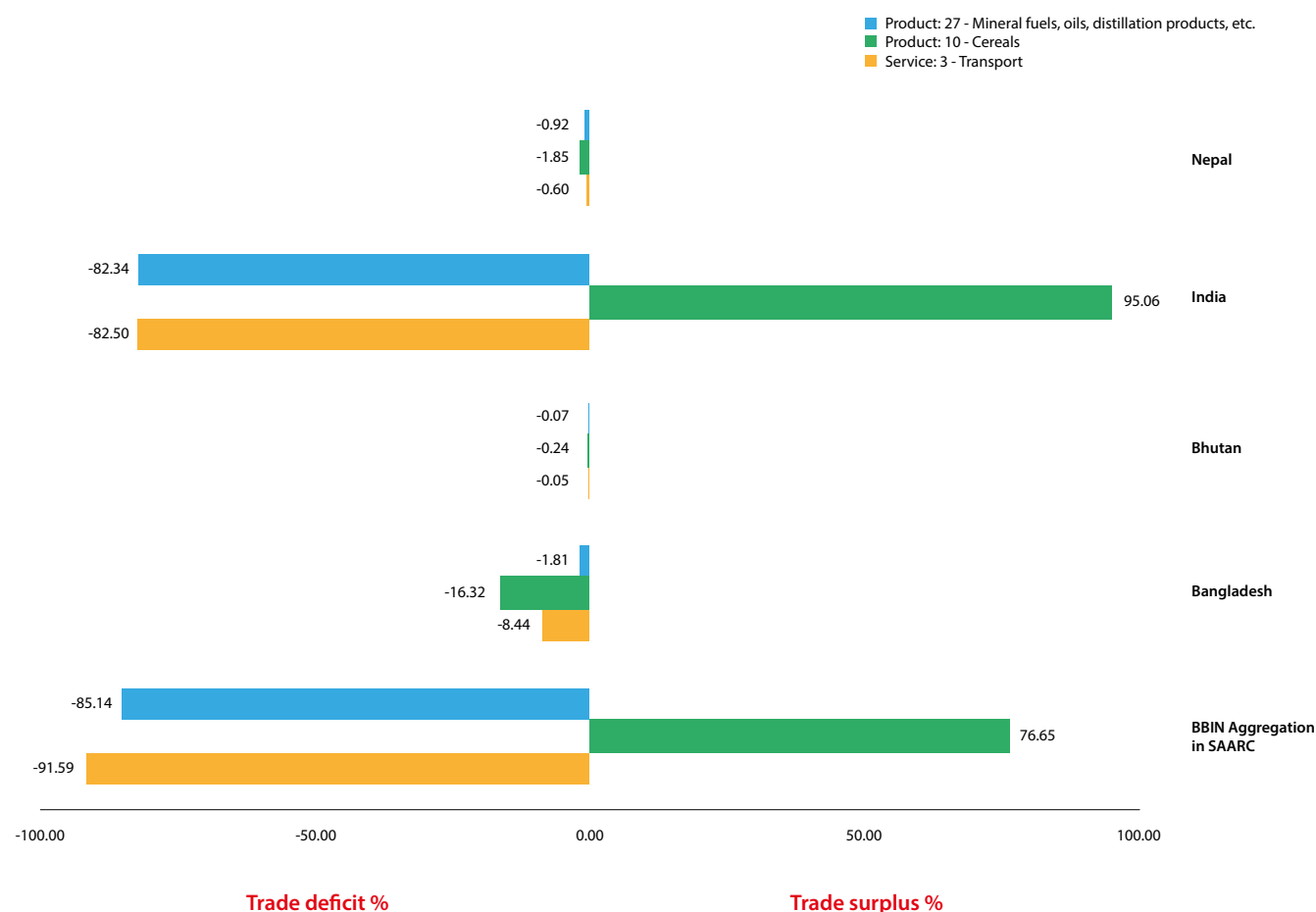
Source: Trade Map, International Trade Centre, Geneva

**Table 2. HS Code & Service label of key products with positive balance of trade in BBIN averaged from 2010-2013**

Product:10-Cereals	Product:27-Mineral fuels, oils, distillation products, etc.
▶ '1006-Rice ▶ '1005-Maize (corn) ▶ '1001-Wheat and meslin ▶ '1003-Barley ▶ '1008-Buckwheat, millet and canary seed	▶ '2710-Petroleum oils, not crude ▶ '2707-Oils & other products of the distillation of high temp coal tar etc. ▶ '2716-Electrical energy ▶ '2703-Peat (including peat litter), w/n agglomerated ▶ '2702-Lignite w/n agglomerated, excluding jet

Source: ITC Trade Map, Accessed on 22<sup>nd</sup> April, 2014

**Figure 1. Balance of trade for 3 categories of products/services in BBIN averaged from 2010 to 2013**



integration, but it also brought renewed focus on the necessity to ease the process of harmonising procedures and regulations among the four South Asian countries (Banerjee, 2015). The MVA solved multiple issues, one of which is that the same vehicle could now go directly to the final destination in both the countries and then carry back consignments when travelling back. This reduced much of the time and cost involved in unloading and reloading of vehicles in the Land Customs Stations (LCSs) and also helped in streamlining the transportation bottlenecks at all the LCSs (CUTS International, 2014).

Interestingly, the success of BBIN MVA has also facilitated a silent progress on a connectivity pact called the BBIN Railway Agreement, since India is expanding railway links with its neighbours through the Northeast part with the help of the Ministry of Development of North Eastern Region (DoNER), North East India.

The land connectivity discussions are bound to spill over to water at some point in the BBIN trade facilitation dialogues. The end result will be a robust emphasis from the BBIN countries to create an inland waterway (IWWs) system as alternate routes for connectivity. These developments should be seen in view of the existing transportation of fly-ash on Indo-Bangladesh Protocol Routes. Pilot movement of fertilisers on the NW-1<sup>8</sup> by Indian Farmers Fertiliser Cooperative Limited (IFFCO) and TATA Chemicals is an example to depict that irrespective of the cargo contents IWWs can stimulate a considerable amount of economic activity.

The Food Corporation of India (FCI), one of the largest food distributors in the world, has also finalised protocol routes for pilot movement of food grains exclusively to the North-east through national IWWs (CUTS International, 2015). The BBIN group of countries have also agreed to exchange lists of potential future/power projects to be undertaken jointly

among at least three countries. This would also support the current bilateral arrangements on flood forecasting for the four countries.

## Conclusions

In the current context of liberalised free trade policies and increasing the ease of doing business, international regulatory frameworks can be reinforced to converge at sub-regional trade pacts. A remarkable understanding from the instances described above is that a considerable amount of trade going on among the BBIN group of nations is quite local in origin. The majority of commodities being transacted in the sub-regional trade are categorically locally sourced. Seed grains of cereals, fly-ash, fertilisers and food grains are directly linked to agricultural productivity and related economic activities in the local context.

Therefore, trade corridors along the BBIN will increase the economic dividends at a local level. This is precisely the argument behind the theory of oceanic circles. The local economies will generate the most tradable goods from local levels which can be eventually collated and transacted at the regional level. These goods can be varied ranging from products like handicrafts, local plant varieties to services like successful models of community managed hydel pumps. The trade corridors will expedite connectivity and endure a sustainable movement of ripples extending around in the ocean.

To facilitate the policy environments in such cases, countries need to replace 'bureaucratic diplomacy' with 'economic diplomacy'. It is at this juncture grassroots groups and relevant advocacy voices need to come in and merge with political goodwill and trade connectivity initiatives. The local ripples from local advocacy will also feed into the bigger picture of regional policy integration and benefit regional trade for sustainable development. ■

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1. Comprised of Bangladesh, Bhutan, India and Nepal
2. Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) is comprised of Bangladesh, India, Myanmar, Sri Lanka, Thailand, Bhutan and Nepal.
3. Comprised of Bangladesh, China, India and Myanmar Forum for Regional Cooperation
4. Comprised of Bangladesh, China, India and Nepal
5. South Asia Sub-regional Economic Cooperation (SASEC) is comprised of Bangladesh, Bhutan, India, the Maldives, Nepal and Sri Lanka
6. Comprised of Singapore, Johor (in Malaysia) and a part of Riau Islands Province (in Indonesia)
7. Sanskrit word comprising of the triad cosmic functions of creation, maintenance and destruction
8. The National Waterway 1 or NW1 (From Oct. 1986) is 1620 km long and is the longest waterway in India. It runs across the Ganges, Bhagirathi and Hooghly river systems and passes through Uttar Pradesh, Bihar, Jharkhand and West Bengal.



# EBACE2016 showcased business aviation's size, strength, diversity

**Ed Bolen is President and CEO of the National Business Aviation Association (NBAA)**

**T**he 2016 European Business Aviation Convention & Exhibition (EBACE2016) recently concluded as an extremely successful event, once again demonstrating the strength, size, and resilience of the European business aviation community.

Held annually at the Palexpo center and Geneva International Airport in Geneva, Switzerland, and jointly hosted by the National Business Aviation Association (NBAA) and the European Business Aviation Association (EBAA), EBACE serves as Europe's premier showcase for business aviation, while also providing an important venue to continue the vital dialogue between regulatory authorities, business leaders and other stakeholders.

EBACE2016 featured more than 450 exhibitors from more than 40 countries, across the largest show footprint yet for an EBACE, with attendees from more than 100 countries throughout the European region and beyond.

The event also served as a powerful venue for closing deals and generating headlines, with a variety of press conferences held during the show, and more than 400 journalists from all over the world in attendance. A sold-out static display of aircraft included the first public appearances in Europe of the Pilatus PC-24 light jet and a VIP edition of the Boeing 787-8 by Boeing Business Jets - the largest aircraft ever displayed at an NBAA-sponsored event.

As EBAA President Brian Humphries noted, *"We're very pleased with the level of enthusiasm we've seen this year... In*

*addition to the busy show floor and sold-out aircraft static display, our seminars and education sessions were well attended, and participants were very engaged with presenters and one another."*

The show's Opening General Session lineup was among the strongest ever, featuring leaders from government and industry. Keynote speakers included former Foreign Minister of France and co-founder of Doctors Without Borders, Dr Bernard Kouchner; Executive Director of the European Aviation Safety Agency (EASA), Patrick Ky; and Channel IT Group founder and CEO Bassim Haidar, whose company utilizes business aviation in providing telecommunications and electricity in 23 countries in Asia, Latin America, Africa and the Middle East.

EBACE2016 also included an impressive roster of education sessions covering important industry topics and trends. The day-long EBACE Safety Workshop focused on key safety challenges affecting business aviation, while also discussing the International Standard for Business Aircraft Operators (IS-BAO) as an alternate means of compliance with EASA's new Part-NCC (non-commercial operations with complex motor-powered aircraft).

The show's popular *Inspiration Zone* also hosted a variety of sessions on timely topics, including a gathering of about 40 recent graduates and current students who attended the event's third day for free as an introduction to the broad range of opportunities available within business aviation – from engineering and maintenance to marketing and sales;



**Bernard Kouchner, former French Minister of Health and co-founder of Doctors Without Borders, speaks at the Opening General Session**

from flight operations to interior design. Separately, a pop-up education session focused on what regions, health risks and quarantine procedures business aircraft operators should prepare for in parts of the world affected by the Zika virus.

### **Event highlights collaboration between international associations**

In addition to its traditional role as Europe's most significant business aviation event, EBACE2016 also provided a welcome opportunity to highlight advocacy efforts underway across Europe by EBAA, in many cases in collaboration with NBAA.

In addition to work by the associations to foster the industry's growth in the regions we represent, this collaboration through EBACE also illustrates how NBAA and EBAA come together on a variety of policy concerns at the forefront of our shared aviation community, and how that is reflective of our continuing work together on policies that mutually benefit the industry on a global scale.

For example, our shared efforts through the International Business Aviation Council (IBAC) on aircraft emissions policies for business aviation has emphasized our commitment to improve our industry's already very small contribution to greenhouse gas emissions. This is a core tenet of our position in the International Civil Aviation Organization's (ICAO) greater debate on the matter.

Another issue that we have mutually worked on is the elimination of an onerous and long-standing requirement by the US Transportation Security Administration (TSA) for security waivers affecting the intra-US segments of non-US-registered aircraft. In the past year, our continuing efforts with TSA have led to the elimination of that requirement, out of recognition that the US government already receives sufficient security information about business aircraft before they arrive in the country.

Along similar lines, a joint effort by NBAA and EBAA, again with IBAC, resulted in a favorable opinion from the World Customs Organization and the European Commission on regulations covering the temporary admissions policy for business aircraft that may only be in a European location briefly.

Working together, we have ensured that those regulations differ from policies applying to the airlines, out of recognition of the unique operating models in our industry, and the implications of that reality for customs and importation duties.

For these reasons and many more, NBAA is actively involved with EBAA on a variety of policies affecting business aviation in Europe. It's clear that NBAA and EBAA are more than trade-show partners and co-sponsors of EBACE; our associations

*“In addition to its traditional role as Europe's most significant business aviation event, EBACE2016 also provided a welcome opportunity to highlight advocacy efforts underway across Europe by EBAA”*

present a united front against a variety of challenges that threaten our industry, whether speaking of the US, Europe, or other points around the globe. These challenges continue to underscore the significance of our combined efforts to respond to these uncertainties.

Just as EBACE is a premier event and the annual meeting place for the European business aviation community – bringing together business leaders, government officials, manufacturers, corporate aviation department personnel and all manner of people involved in nearly every aspect of business aviation – the shared conversation hosted through EBACE helps showcase our associations' work to advocate for the industry on those issues throughout the entire year.

By every measure, EBACE2016 was a great success, and we are delighted with the support we continue to receive from exhibitors and attendees. Along with our partners at EBAA, NBAA looks forward to welcoming everyone back to Geneva for EBACE2017, which will take place from May 22 to 24, 2017.

As another demonstration of our industry's scope, I would also like to invite readers of *World Commerce Review* to join the estimated 27,000 industry professionals attending this year's NBAA Business Aviation Convention & Exhibition (NBAA-BACE2016), which will take place November 1–3, 2016, in Orlando, FL.

Widely regarded as the most important three days of business aviation, NBAA-BACE2016 will bring together current and prospective aircraft owners, manufacturers and customers into one meeting place to get critical work accomplished, all while once again showcasing the size, strength, and diversity of this vital global industry. ■



# The Cayman Islands Aircraft Registry

## A first class experience

Danielle Roman and Tracey Forbes examine how the CAACI has embraced the requirements and spirit of the Cape Town Convention, which has fortified the Cayman Islands' position as an offshore market leader in both commercial and corporate jet financing and as an aircraft registry of choice

**T**he Cayman Islands has long been recognised as a leading jurisdiction for cross-border aircraft financing. The efficient framework within the Cayman Islands for the registration of aircraft and aircraft mortgages, with a longstanding history of effective safety oversight which adhere to international standards of compliance, aircraft maintenance and airworthiness, is underpinned by the jurisdiction's political stability and its highly developed, flexible, English-based legal system.

The extension of the Cape Town Convention on International Interests in Mobile Equipment and the associated Protocol on matters specific to Aircraft Equipment (the Cape Town Convention) to the Cayman Islands on 1 November 2015 has symbolised the Cayman Islands' commitment to the aviation industry and has solidified the Cayman Islands aircraft registry's position as a first class aircraft registry.

### **Joining the club - what is the Cape Town Convention and why is it so important?**

Prior to the Cape Town Convention, there was no internationally accepted framework to govern the rights of creditors and debtors over an aircraft. The mobile nature of an aircraft made it challenging to determine the true risk of a sale or financing of aircraft, resulting in difficulty in acquiring affordable financing and certainty of protection of interests. In an event of a default, there was no consistent set of internationally recognized remedies that could be sought by creditors and lessors, as regulations governing default and repossession of aircraft would differ from country to country.

The Cape Town Convention established an international legal framework for the creation and registration of international interests in helicopters, airframes and aircraft engines which fall within the meaning of 'aircraft objects' under the Cape Town Convention. Creditors and other third parties with an 'international interest' in an aircraft object can register each separate interest on the International Registry to guarantee their priority of claim against other parties. They also have the comfort of an internationally recognized set of rights in the event of a debtor default or insolvency, as well as a framework for resolving disputes arising under the Cape Town Convention.

With the extension of the Cape Town Convention, Cayman Islands entities no longer have to 'opt-in' to legislation in order for the Cape Town Convention to be applicable, as was required under the previous legislative regime. This allows the

Cayman Islands to offer creditors and lessors the protections provided under the Cape Town Convention which were not previously available.

The Cape Town Convention applies to a transaction where (i) there is an 'aircraft object' which meets the size requirements set out in the Cape Town Convention, (ii) there is an international interest capable of registration under the Cape Town Convention and (iii) the debtor is located in and/or the aircraft is registered in a Contracting State (which would include the Cayman Islands).

### **What does this mean for the Cayman Islands aviation industry?**

The implementation of the Cape Town Convention has been a welcome addition to the jurisdiction's sophisticated aircraft finance regime. The advantages both owners and creditors have perceived over the last six months since implementation of the Cape Town Convention in the Cayman Islands include:

- additional comfort to financiers who are able to rely on international standards governing priority of their security and the range of remedies available under the Cape Town Convention in an event of default under finance documents;
- reduced costs to airlines through the 'Cape Town discount' from export credit agencies under OECD guidelines and The Export-Import Bank of the United States offering improved financing terms for buyers in countries which have ratified the Cape Town Convention; and
- beneficial owners in non-Contracting States (eg. Hong Kong) owning or leasing an aircraft through a Cayman Islands entity, as well as financiers and lessors seeking to lend or lease to those entities, may now be able to benefit from the advantages of the Cape Town Convention.

### **Creditor friendly declarations**

There are certain provisions of the Cape Town Convention which only apply in respect of a Contracting State if it makes an opt-in declaration or an opt-out declaration to that effect.

The UK government has made a number of declarations on behalf of the Cayman Islands, including:

- Non-consensual rights: existing and future non-consensual rights and interests (eg. a lien of an airport



authority in respect of unpaid taxes) will have priority over all international interests, including those registered prior to 1 November 2015.

- Remedies: all remedies available to creditors and lessors under the Cape Town Convention which are not expressed to require application to the court may be exercised without leave of the court.
- Cooperation with foreign courts: the Cayman Islands courts will co-operate to the maximum extent possible with foreign courts and foreign insolvency administrators in carrying out insolvency remedies set out in the Protocol.
- Speedy relief pending final determination: the Cayman Islands courts will grant interim relief within 10 working days to creditors applying for preservation, possession or immobilization of an aircraft, pending a final determination.
- Alternative A: on the occurrence of an insolvency related event, the debtor (or insolvency administrator) shall (subject to certain conditions) give possession of the aircraft no later than at the end of a 60 calendar day waiting period.

These creditor friendly provisions provide greater certainty around the treatment of debtors in an insolvency scenario, including cross-border insolvency cooperation between Contracting States.

**CACCI's first class service – what is the role of CAACI?**

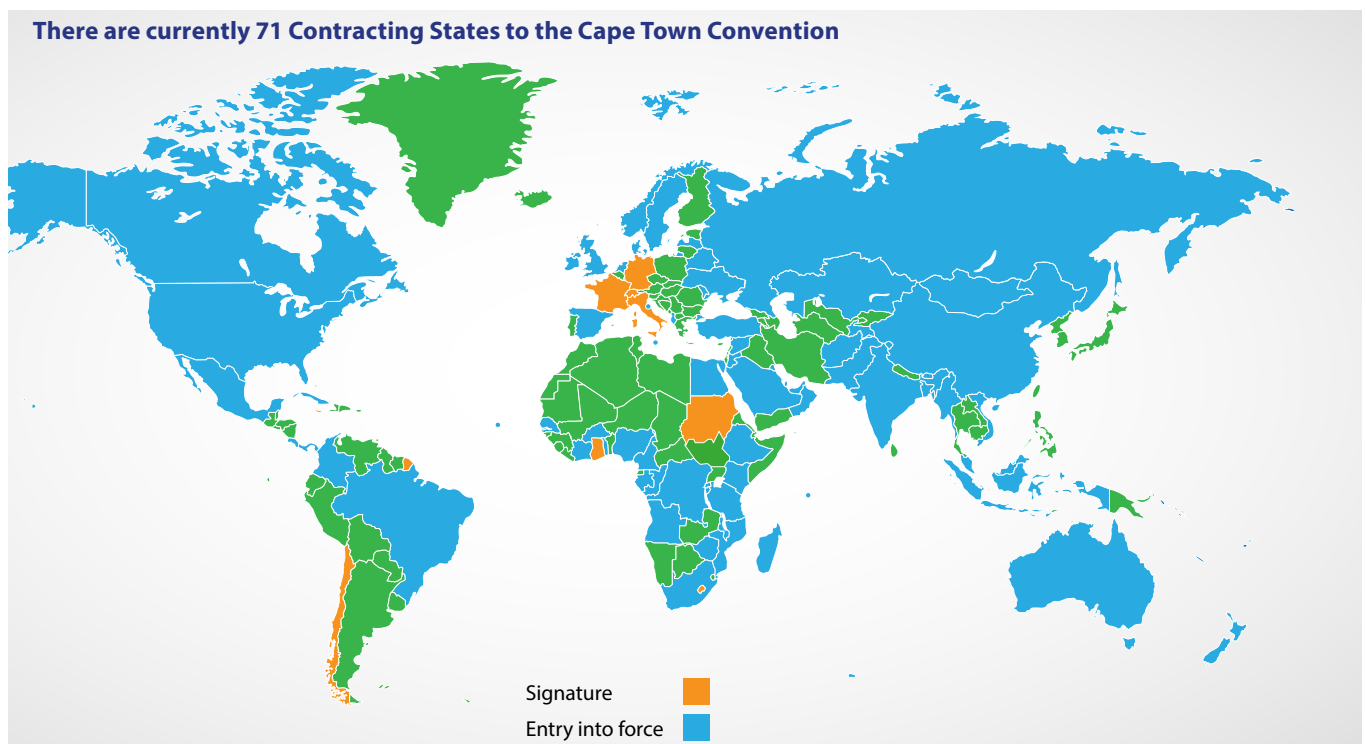
The Civil Aviation Authority of the Cayman Islands (CAACI) is the statutory body responsible for aviation regulatory oversight in the Cayman Islands and maintaining the Cayman Islands aircraft register (the Aircraft Register). CAACI has a reputation of being one of the most highly respected, user-friendly and recognised aircraft registries across the aviation industry, providing high quality support through a mission of 'safety first' with a dedicated team of professionals for over 30 years.

*“The potential cost savings and protections afforded by the Cape Town Convention has fortified the Cayman Islands’ position as an offshore market leader in both commercial and corporate jet financing and as an aircraft registry of choice”*

CAACI is the registry of choice for many multinational corporate and high net-worth individual beneficial owners, with registered aircraft based globally in countries throughout Europe, Middle East, South America, Asia, North America and South Africa. CAACI has over 230 aircraft registered on the Aircraft Register from some of the world’s leading business aviation manufacturers, including Gulfstream, Boeing Business Jet, Airbus Corporate Jet, Embraer, Dassault Falcon, Cessna Citation and Bombardier Global Express.

The Cayman Islands facilitates a dual registration system for aircraft mortgages. Registrations can be made on the International Registry under the Cape Town Convention, as well as domestically on the register of aircraft mortgages (the Mortgage Register) maintained by CAACI. When the Cape Town Convention applies, CAACI advise parties to continue to make registrations on the Mortgage Register with CAACI as an additional layer of protection if, for example:

- if it transpired that the Cape Town Convention did not actually apply to the aircraft mortgage;
- there is a likelihood that the aircraft may need to be repossessed in a non-Cape Town Contracting State (which may not recognize the concept of an 'international





interest' but will recognize the concept of a registered mortgage);

- the debtor refused consent to registration with the International Registry (whereas the debtor's consent is not necessary to register an aircraft mortgage on the Mortgage Register); or
- the creditor or lessor wishes to have available to it additional remedies which may be available under domestic Cayman Islands law but not under the Cape Town Convention.

The domestic registrations on the Mortgage Register remain relevant for mortgages over aircraft objects that do not meet the requirements under the Cape Town Convention.

From a practical perspective, CAACI has embraced the requirements and spirit of the Cape Town Convention. For example, the Cape Town Convention allows lenders and lessors to register an Irrevocable De-registration and Export Request Authorisation (IDERA), which facilitates the exercise of one of the remedies a creditor may exercise in the case of a default. CAACI readily accepts filings of IDERAs with the Aircraft Registry for Cayman Islands registered aircraft.

### **Up, up and away...**

The much anticipated extension of the Cape Town Convention to the Cayman Islands has been welcomed with open arms

by financiers, lessors and aircraft owners. The potential cost savings and protections afforded by the Cape Town Convention has fortified the Cayman Islands' position as an offshore market leader in both commercial and corporate jet financing and as an aircraft registry of choice. We expect that the jurisdiction will go from strength to strength as an aircraft finance industry leader and continue to set the pace as a first class aircraft registry. ■

### **ABOUT THE AUTHORS**

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*Mourant Ozannes has an international reputation as having one of the leading offshore aircraft finance practices, advising on the laws of the Cayman Islands, BVI, Jersey and Guernsey.*



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# Equipping managers to help the world



Alexandra Santos and Mathabo le Roux explain how a UN initiative is encouraging business schools to prepare students for tackling poverty and other development challenges

**T**he United Nations recently announced sustainable development goals (SDGs) intended to galvanise worldwide action on poverty reduction, food security, human health and education, and a range of other economic, social and environmental objectives.

The United Nations Conference on Trade and Development (UNCTAD) estimates \$3.9 trillion in annual investment into developing countries is needed to meet these goals. It is therefore clear that private sector buy-in to the development agenda will be critical to advance the goals.

The good news is that the private sector does not lack the resources to contribute.

The growth of investment by multinational firms in developing countries over the last decade has been phenomenal. In search of new markets, resources and lower labour costs, investment in the developing world soared from less than 20% of the total in 2000 to more than 50% today, creating jobs and opportunities for local firms as suppliers and partners to international businesses.

However, most of this investment has gone to middle-income emerging markets. Investment in least developed countries (LDCs) remains only a fraction of the total, at less than 2%. And a significant part of that investment is in large-scale resource-based projects that create relatively few jobs and linkages with local firms.

The challenge, then, is to mobilise private sector finance to flow to regions – and sectors – where need is greatest, and make sure adequate management skills are on the ground to ensure successful project implementation.

It would seem then that courting the private sector to support the SDGs will spring up almost as an auxiliary goal alongside the primary set of goals. In short: we have to get business to ‘get’ the business case of the SDGs.

While some novel approaches are already steering more capital towards development oriented outcomes, conventional business approaches remain entrenched, particularly in markets where needs are most acute.

Most businesses systematically exclude the vast majority of the global population: their money bypasses low-income markets, their products and services are beyond the reach of poor consumers and their business models often fail to recognise the poor as potential contributors to economic activity.

Mounting social and environmental challenges require a wholesale rethink of conventional business approaches in order for ‘finance for development’ to become the future mainstream investment.

The majority of managers in the world’s financial institutions and large multinational firms – the main sources of global investment – as well as most successful entrepreneurs tend to be strongly influenced by models of business, management and investment that are commonly taught in business schools.

While business schools are increasingly factoring these dynamics into their curriculum planning, many programmes still focus on business models that work in developed country contexts. Not enough classroom time goes to exploring the intricacies of doing business in lower-income, higher-risk contexts, which call for alternative approaches and different models.

This asymmetry has left most graduates unprepared for the particular challenges associated with underdeveloped markets and ill-equipped to invest and operate effectively in them.

13%

Less than 13% of the case studies are based on real-life studies situated in developing countries. For LDCs that figure drops down to less than half a per cent

Case studies are a case in point. These real-life examples have become an integral part of how the business school curriculum imparts knowledge and skills based on real-world business examples.

Yet less than 13% of these cases are based on real-life studies situated in developing countries. For LDCs that figure drops down to less than half a per cent.

The lower segments of the income pyramid are a diverse and viable market. Opportunities for graduates skilled in building and running business that cater to the Base of Pyramid are equally diverse, ranging from locally owned social enterprises and SMEs, non-profits and development organisations to impact investment firms and multinationals seeking to expand their footprint to developing markets.

UNCTAD’s Division on Investment and Enterprise launched Business Schools for Impact (BSI) to help drive a mindset change. In partnership with key business school associations, it has built a robust network of 250 impact-oriented business schools committed to building awareness of the need to mobilise investment management resources for sustainable development.

*“The majority of managers in the world’s financial institutions and large multinational firms – the main sources of global investment – as well as most successful entrepreneurs tend to be strongly influenced by models of business, management and investment that are commonly taught in business schools”*

*“The initiative has met with unprecedented enthusiasm from the business school community, confirming the interest in impact-oriented business practice and the need for an initiative of this nature”*

The platform provides educational tools and resources to equip students with the skills necessary to invest and

250

In partnership with key business school associations, UNCTAD’s BIS has built a network of 250 impact-oriented business schools

40

Forty internships are available in 16 developing countries, across Africa, Asia and Latin America, to give students practical exposure to operating in these markets

operate in low-income regions. Educational materials are complemented by opportunities for experiential learning in developing countries through fieldwork. Currently, the key platform elements include:

- Forty-eight impact-oriented teaching modules – in both elective and core courses – that can be introduced in existing curricula or used to build a new curriculum that puts sustainable development imperatives at the core of the teaching plan

- More than 50 case studies that (i) are located in relevant markets (23% per cent are in LDCs, 38% in Africa, 33% in Asia, and 10% in Latin American and the Caribbean); (ii) illustrate alternative business models and ownership structures; and (iii) focus on sustainable development sectors, including agriculture, education, energy, health, water, and women and youth entrepreneurship
- Numerous internship opportunities in developing countries, and with social enterprises and SMEs, to give students practical exposure to operating in these markets. The internships are available in 16 developing countries across Africa, Asia and Latin America

The initiative has met with unprecedented enthusiasm from the business school community, confirming the interest in impact-oriented business practice and the need for an initiative of this nature.

Since its official launch at the World Investment Forum in October 2014, the community has grown to more than 650 educators, students and practitioners, representing 250 business schools and 100 companies and related institutions worldwide.

Business schools will be instrumental in developing a new generation of business leaders who can help solve our global development challenges. With Business Schools for Impact, UNCTAD hopes to spur schools into action and help equip them to do just that. ■

*The website can be visited at [www.businessschoolsforimpact.org](http://www.businessschoolsforimpact.org)*

#### ABOUT THE AUTHORS

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# Combatting climate change

Dr Matthias Kroll, Chief Economist - Future Finance at the World Future Council, looks at financing the 1.5°C limit by matching new 'green helicopter QE' with private capital

**T**he international community of 195 countries has agreed on an ambitious agenda to curb climate change. In the Paris agreement they have decided to cut greenhouse gas emissions to a level that will limit the rise in average global temperatures to 1.5°C. To reach zero emissions at least by 2050 (and for a likely chance to stay below a rise of 1.5°C), we need to scale up and accelerate the move towards 100% renewable energy (RE). This requires annual expenditures on a very large scale. The International Energy Agency (IEA) has established that US\$1 trillion pa of renewable energy investments would be needed to stay within the 2°C limit.

Currently, there are no exact figures available that assess the costs of achieving the new 1.5°C limit. However, referring to the IEA sum it seems a realistic first estimation to place the required annual financial needs for climate investments between \$1.5 to 2 trillion.

Due to this seemingly enormous figure, many observers assume that the realisation of such large scale expenditures would require an abandonment of other consumer- and investment spending. However, this sacrifice is only necessary if we presume that economic resources are fully utilised and that a dollar spent on renewable energy would require a reduction in investments on other reasonable obligations like education and health care.

Unfortunately, the latter is – more or less – the presupposition of the majority of (microeconomic guided) mainstream economists. However, in the existing capitalist world (and in the documented data of the Fed and the ECB), real capital resources (as well as the workforce) are continuously under-utilised. Furthermore, the money supply is not an external constraint but endogenously determined through the financial needs of the economy. The financial constraints for climate investments are therefore not a result of a lack of savings or (private) credit, but instead a lack of profitable climate investment opportunities.

According to the UNEP data, in current circumstances only RE investments of \$285 billion are profitable and could be

financed through the involvement of private capital. The question we now face is: how are we going to finance the gap between the current \$285 billion and the needed \$1,500 billion to \$2,000 billion?

## Where does the money come from?

It is still unclear how conventional financing sources can provide the minimum \$100 billion per year necessary for the UN Green Climate Fund (GCF) in order to attract further investment from the private sector. Previous experience with financing commitments, from a CO<sub>2</sub> tax or semi-public funds such as revenues from emissions trading, indicate that the sums actually disbursed will regularly fall short of the ones promised. For example, the current amount of grants provided to the UN Green Climate Fund stand at \$10.4 billion in total, not per year.

## 'Helicopter QE' for the climate

An alternative way of financing and providing sums larger than \$100 billion to the Green Climate Fund or multilateral development banks (MDBs) could be the involvement of central banks. These can never become insolvent in their own currency due to their monopoly of issuing the legal tender – even if they purchase non-performing assets. The economic potential of central banks was witnessed during the bank bailout, leaving no apparent reason why they should not contribute to saving the climate with a fraction of the funds previously used. In order to do this, central banks would continue doing what most of them are currently doing to combat the effects of the financial crisis: buying bonds to create new liquidity.

To combat climate change, central banks would need to buy 'Green Climate Bonds' issued by the Green Climate Fund or designated multilateral development banks. By doing so, they would finance concrete RE investment projects rather than invest in government or corporate bonds. The monetary policies of the central banks would benefit from this new liquidity to finance real production instead of simply purchasing existing financial assets. So, instead of talking about 'QE for the banks' we should focus on 'green helicopter QE for the climate'.



Interestingly, the governor of the Bank of England just recently argued that the risk to the stability of the financial system from climate change is a responsibility of central banks.

### **But how realistic is a new form of 'green helicopter QE' for the climate?**

When the new limit of 1.5°C was agreed in Paris, the consequences of the financial crisis reached a new level. Today an increasing number of economist, think tanks and policy-makers realize that the traditional monetary tools of central banks (lowering interest rates and flooding the banks with liquidity), formerly crucial for combating an economic recession, have lost their power.

Even conservative think tanks have started to recognize that central banks need a new effective tool to influence economic growth and the inflation rate, in order to react to the next global recession (which is probably just around the corner. Against their inherent neoliberal ideology they have started to advocate for a direct quantitative easing (QE) in the form of so called 'helicopter money'.

### **'Helicopter money' is widely discussed**

There is a good chance that central banks decide to implement these new tools of direct QE in the near future, handing out a three-digit sum of newly created money to citizens and governments. Such direct 'helicopter QE' basically means that central banks provide their governments with money to hand out directly to citizens or to finance additional and urgently needed public investment. One area where investments are strongly needed is the setup of a 100% renewable energy system in order to achieve the 1.5°C limit.

### **What does this mean for the global climate finance situation?**

The introduction of 'helicopter QE' by central banks would provide a huge opportunity for implementing large scale financial tools for climate protection investments. No national budget or taxpayer would be burdened through the investments since they would be financed with newly created money. It would also be possible to provide the Green Climate Fund or multilateral development banks with money in the form of loans which virtually became the form of grants.

### **How did central bank loans become grants?**

If Green Climate Bonds issued from the GCF or MDBs and purchased by the central banks had a virtually infinite maturity, there would be no need to pay them back. Therefore, the money which the GCF or the MDBs receive from the central bank in return for the issued bonds can be regarded as a grant. Central banks can buy such 'perpetual' bonds due to their unique role in the financial system as creators of money. Other than normal banks, their primary job is not to earn money from savers and lend it to borrowers, but to provide the economy with sufficient money (legal tender).

As long as the balance sheet of a central bank is growing every year, they can buy 'perpetual' green climate bonds, take the bonds in their balance sheet and keep them there. While combatting the financial crisis over the last few years, the balance sheets of central banks have grown irregularly. However, in a study about new climate finance possibilities, the World Future Council identified a global scope for all central banks of roughly \$700 billion a year, which could be used by central banks in order to buy 'infinity' bonds.

*"... the governor of the Bank of England just recently argued that the risk to the stability of the financial system from climate change is a responsibility of central banks"*

So, a figure of \$100 billion a year for the GCF seems reasonable. Another advantage of such a Green Climate Bond system is its ability to start operating, even if at first only a few (strong) central banks are on board. Of course, the scope of money would then grow smaller in relation to the number of central banks which take part.

If central banks want to withdraw a part of the new liquidity created by the purchases of perpetual Green Climate Bonds, they could raise the reserve requirements and/or raise the interest rates to lower the demand for credit. Thus, central banks remain independent by executing their monetary policy.

But how could Green Climate Bonds become a new monetary tool for central banks to inject money directly in the economy, if they are used for RE investments in developing countries? Due to the fact that the majority of industrial capacities are in the developed countries, it could be strongly assumed that a large part of the new money for the RE investments would be invested in these countries.

This could be illustrated in a short example: the GCF or the MDBs have to choose a project to support. If the RE project in a developing country needs eg. solar panels from China, wind turbines from Spain and Denmark and other related grid equipment from Japan and the US, the GCF or the MDBs have to issue Green Climate Bonds to the central banks of these countries. Then the GCF or the MDBs would pay for the RE equipment and the new goods were produced in the developed countries. The needs of the central banks are now satisfied, because the new money is spent in their respective economies.

Simultaneously, a new RE power plant would be installed in the developing country, which would be impossible to finance without the support from the GCF or the MDBs. The new RE facility would produce green electricity and support the local economy. The benefit for the developing country is that it gains RE equipment from industrialized countries without the need to pay for it in a foreign currency.

### **The involvement of private capital**

The example further assumes that the RE investment project would need, based on projected electricity prices, a 30% start-up funding to be economically feasible. That means that a total RE investment of \$1 billion would need funding of \$300 million from the GCF or the MDBs. Because the project is then profitable, the balance of \$700 million could be obtained from private investors. Thus, a matching of 'green helicopter QE' with private capital to finance sufficient RE investments in order to reach the 1.5°C limit is possible.

The aim of the Green Climate Bonds is to finance otherwise unfeasible RE investments. This means it should make

climate-friendly investments profitable in order to make them attractive for private investors. Other forms of private capital involvement are possible.

In addition, Green Climate Funds could be used as debt guarantee for private climate finance investments or as safeguard against currency or other political risk. The amount of Green Climate Bonds purchases from central banks should be related to:

- (1) the needs of the achievement of the 1.5°C benchmark and
- (2) the need of central banks for an innovative monetary tool to inject new money directly in the economy.

**Is there a lack of real capital to establish the RE transition?**

Yet, if the finance challenge of the RE transition could be resolved, it had to be clarified whether the real capital side could deliver the necessary investment without a significant inflationary impact. This could be assumed if the industrial capacities are underutilized.

The central banks of the United States (Fed), as well as the European Central Bank (ECB) have established data on the degree of utilisation of industrial production capacities. They find long-term average degrees of capacity utilisation of around 80% (Fed) and 81% (ECB). It should be noted that the degree of capacity utilisation even under boom conditions has never risen above 85%. Therefore, it could be assumed that firms adjust their capacities even before they reach full utilisation to prepare for increasing demand in the future.

There may be a mismatch between the free reserves of real capital, the qualifications of the currently unemployed, and the structure of the new demand for climate investments. However, a market economy with competing businesses is designed to absorb and balance such changes.

Therefore, it is to be expected that additional and often new demand structure will emerge, creating a corresponding change in the supply structure. Initial mismatches will thus quickly dissipate and the RE transition could become a success. ■



## Methane regulations an expensive mistake



Tim Ball and Tom Harris examine the costs to the oil and gas sector by the EPA's misguided regulations

According to a new study by American consulting firm ICF International, cutting methane (CH<sub>4</sub>) emissions from industry will be far more expensive than originally thought. The ICF report, released on June 2, demonstrated that the cost to reduce methane emissions from natural gas systems is \$3.35/thousand cubic feet (Mcf) of methane reduced.

This flies in the face of the costs cited by Environmental Defense Fund of only \$0.66/Mcf of methane reduced, a statistic EDF<sup>1</sup> used in pushing for US Environmental Protection Agency (EPA) regulations on the gas.

Richard Hyde, interim executive director of ONE Future, the coalition of natural gas companies that sponsored ICF's latest work, explains, "This new study provides cost estimates of methane abatement technologies that are more consistent with current market realities."

In their press release on the topic<sup>2</sup>, ONE Future state, "The increased cost of methane reduction is higher than previously estimated largely due to higher assumed costs for leak detection and repair (LDAR) and revised assumptions regarding the ability

of midstream segments to monetize the value of recovered gas... This analysis updates the list of known emission abatement technologies and provides revised costs estimates for each one."

Methane emissions occur throughout the natural gas industry. They come from normal operations and maintenance as well as due to unintended and irregular leaks and equipment venting.

**Staggering costs**

Although the new cost estimates are staggering, the EPA already recognized that methane regulations will be expensive. In their final rule on new, modified and reconstructed sources of methane from the oil and gas sector<sup>3</sup> unveiled on May 12, the agency admitted that the regulations will add about \$530 million—at least 25% higher than their estimates only nine months earlier—in additional costs on the sector per year by 2025. Companies will have to upgrade pumps and compressors, and expand the use of technology designed to capture methane that can be released by newly fracked wells. The costs of exploring, producing, and delivering natural gas will all rise, likely driving many small oil and gas producers out of business and further threatening America's energy security.

Yielding to the demands of environmental extremists, the EPA expanded the final regulation to include low-producing wells that generate less than 15 barrels per day of oil (or its equivalent) and increased leak inspection frequencies at compressor stations.

The new EPA rule is part of the Obama administration's fight to 'stop climate change.' In particular, it will help the United States move closer to President Barack Obama's target of reducing oil and gas sector methane emissions by 40-45% from 2012 levels by 2025. It also provides a legal stepping stone to regulating emissions from 1 million existing wells, something Obama promised during a March summit<sup>4</sup> with Canadian Prime Minister Justin Trudeau.

The EPA formally started work on this extension to the current methane regulations by releasing a draft Information Collection Request (ICR) requiring companies to turn over reams of data about emissions, pollution-reducing equipment, and associated costs. The ICR will impact<sup>5</sup> 22,500 operators and 698,800 facilities. Canadian regulators plan to publish an initial phase of their proposed methane regulations by early 2017.

The final impact of all this on consumers is unknown but undoubtedly significant, in increased heating and cooking costs, not to mention rises in the prices of food and other products, the production, transportation and storage of which require energy.

### Industry response

Oil and gas industry leaders have responded that methane regulations are not needed since the sector is already reducing emissions on their own.

They are right. Isaac Orr, Research Fellow in energy and environment policy with the Arlington Heights, Illinois-based Heartland Institute pointed out<sup>6</sup>, *"Methane emissions from natural gas development have fallen nearly 15 percent since 1990, despite the fact the United States increased natural gas production by more than 50 percent during this period and became the largest producer of natural gas in the world."*

Dr H Sterling Burnett<sup>7</sup>, also an energy and environment policy with Heartland, explains why: *"natural gas producers and pipeline operators already have a financial incentive to capture every bit of it they can and not lose it to leaks. As a result, less than one-and-a-half percent of all natural gas produced, is lost."*

Oil and gas leaders complain that the new rules are very tough on an industry already suffering due to low oil and gas prices, dwindling rig counts and thousands of lost jobs.

They are right on this a well, of course. But, due to either ignorance or fear, they do not bring the most important point: any rules restricting methane are almost certainly pointless from a climate change perspective. Our knowledge about the impact of methane emissions on climate is far too immature to warrant the imposition of crippling costs on the sector and a public that rely on inexpensive power for their prosperity.

### EPA science critique

To understand the degree to which we have been misled on the science backing the methane reduction plans of Obama, Trudeau and other political leaders, consider the following from the EPA website.

## *"The final impact of all this on consumers is unknown but undoubtedly significant"*

In its news release announcing the new regulations<sup>8</sup>, the EPA states:

*"Methane is the second most prevalent greenhouse gas emitted in the United States from human activities..."*

This is the misleading since it ignores water vapor, which the EPA does because the United Nations Intergovernmental Panel on Climate Change (IPCC) ignores it. The IPCC concluded that, while humans produce water vapour (for example, from reservoirs), the amount is so small relative to the total in the atmosphere (water vapour is 95% of all greenhouse gases (GHG) by volume while carbon dioxide (CO<sub>2</sub>) and methane (CH<sub>4</sub>) are 4% and 0.36% respectively) that our production is of no consequence.

They can't possibly know this because we lack even remotely accurate measures of total atmospheric water vapour or how much it varies in space in time.

When climate alarmists finally recognized that there was an upper limit to the warming capacity of CO<sub>2</sub>, they needed a new paradigm to continue the climate scare. After all, a variation in water vapour of at most 1% equals all the possible warming from human produced CO<sub>2</sub>.

At first glance, the new hypothesis sounded feasible: as the atmosphere warms due to rising CO<sub>2</sub> levels, evaporation rates increase which amplify the supposed CO<sub>2</sub>-induced warming. In turn that leads to more evaporation and so on; in other words, a positive feedback.

Problem was, the hypothesis was quickly debunked by scientists in the field. The critical issue is called climate sensitivity. This is a calculation of the amount of temperature increase caused by a CO<sub>2</sub> increase. The IPCC Fourth Assessment claimed a 2.0°C to 4.5°C increase range. This is much lower than earlier and the estimate keeps going down as the theory of positive feedback is rejected. In addition, if there is any sensitivity, it is offset by the negative feedback of increased cloud cover.

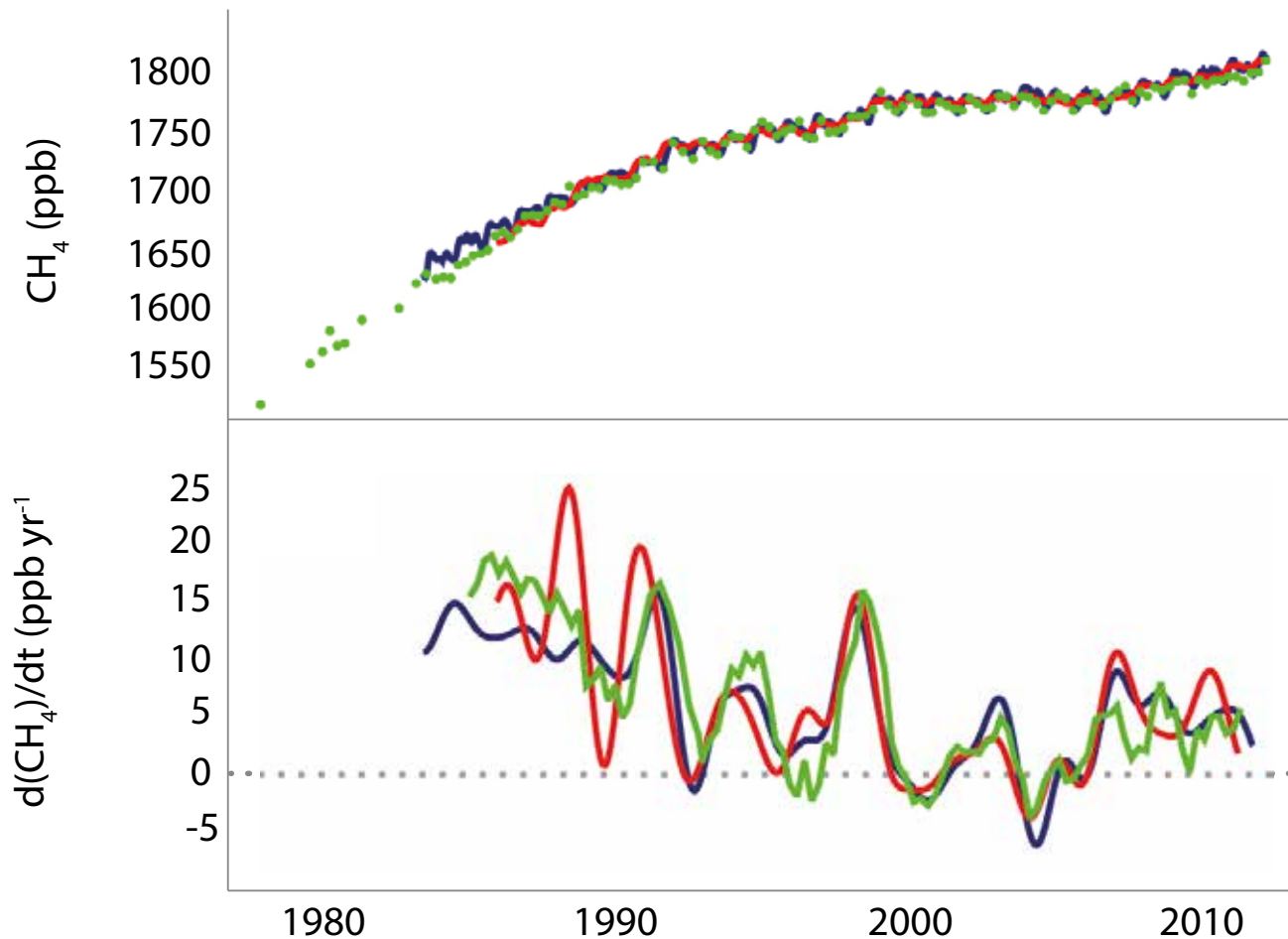
On the EPA web page<sup>9</sup> describing the Obama/Trudeau agreement, the agency asserts:

*"Methane is upwards of 25 times more potent than carbon dioxide in warming the planet ..."*

This comes from a dubious concept: the global warming potential (GWP) of each GHG, in other words, its effectiveness in causing atmospheric warming in comparison with the warming supposedly caused by an equal mass of CO<sub>2</sub> (which is assigned a GWP of 1).

When scientists pointed out how small the amount of atmospheric methane actually was—only 0.00017% of the total atmosphere and 0.36% of the total greenhouse gases—activists had to find a multiplier. Yet, there has never been good evidence supporting the global warming potential idea.

Figure 1



(a) Globally averaged CH<sub>4</sub> dry-air mole fractions from UCI (green; four values per year, except prior to 1984, when they are of lower and varying frequency), AGAGE (red; monthly), and NOAA/ESRL/GMD (blue; quasi-weekly). (b) Instantaneous growth rate for globally averaged atmospheric CH<sub>4</sub> using the same colour code as in (a). From the Fifth Assessment Report of the United Nations Intergovernmental Panel on Climate Change<sup>24</sup>.

The GWP concept became especially attractive to campaigners when the focus was originally on methane from animals. Farmers were under attack from animal rights groups with particular intensity in the 1970s and 80s. When the global warming due to GHG meme came along, it provided an excellent vehicle for activists' agenda.

They said that methane from animals, especially beef cattle, was causing global warming and destroying the planet. The New Zealand governments even planned taxes on animal emissions of methane<sup>10</sup>.

The charade was exposed by the EPA itself<sup>11</sup> when they admitted:

*"EPA and other organizations will update the GWP values they use occasionally. This change can be due to updated scientific estimates of the energy absorption or lifetime of the gases..."*

If GWP values were based on well-understood physics and real data, they would not change over time.

What slowed the methane from animals crusade was not better public understanding, but the fact that Mother Nature

not cooperating. Just as the current 18-year global warming 'hiatus' is making a lie of activists' predictions about the dangers of CO<sub>2</sub>, so the decline in the rates of increase in atmospheric methane levels (see Figure 1 - Figure 2.2 from the IPCC Fifth Assessment Report), now not very different from zero, has refuted the methane argument.

Regardless, the very slight increase in methane levels since 2007 is not coming from hydrocarbon fuel production, according to a new study<sup>12</sup> initiated by NOAA and other scientists around the world. Burnett explains, *"Even the EPA acknowledges natural sources – or other sources, such as livestock or landfills – account for the vast majority of methane emissions, not natural gas production or transport."*

Next, the EPA claims<sup>13</sup>:

*"Globally, over 60% of total CH<sub>4</sub> emissions come from human activities."*

Such confidence is irrational. It was only in 2006 that researchers discovered<sup>14</sup> that rain forests are a major, previously uncounted, source of methane. Similarly, in 2010, it was found for the first time<sup>15</sup> that a wide expanse of Arctic Ocean seabed is bubbling methane into the atmosphere.

If one is unsure about the amount of methane coming from natural sources, as indeed we are, you can't determine the relative importance of the human contribution. And if one cannot determine our relative contribution, then another pillar supporting climate change alarm crumbles and, with it, funding for scientific research. Scientists who made the rain forest discovery must have realized what their research implied and back-pedaled<sup>16</sup>.

The EPA next asserts<sup>17</sup>:

*"Methane is more abundant in Earth's atmosphere now than at any time in at least the past 800,000 years. Due to human activities, CH<sub>4</sub> concentrations increased sharply during most of the 20<sup>th</sup> century..."*

There is no convincing empirical evidence to support this. The determination to find a human cause of assumed methane rise has created tunnel vision. A list of targets included;

- Termites: forest clearing in Africa created more termite habitat which supposedly increased methane emissions. But then they discovered that termites numbers were overestimated by a factor of four.
- Beaver: the fur industry decline resulted in decreased trapping, and so more beaver, and so more beaver ponds, flooded land, thereby creating more methane. The actual numbers of beavers and the area covered by ponds proved insignificant.
- Cattle: there has been an increase in cattle, especially in North America. However, they ignored the parallel decrease in ruminants such as bison, elephants, and others. Those decreases are regrettable, but a fact in proper scientific assessment. In an apparent effort to appease political correctness, not included was the impact of 250 million sacred cows in India, or the increase in Asian rice paddies, the second largest source of human-produced methane.
- Permafrost: global warming was supposedly causing permafrost to melt, releasing more methane. Russian<sup>18</sup> and other scientists<sup>19</sup>, contradicted this claim.

This is worse than pseudo-science, it is deliberate deception to create 'science' for a political agenda.

### Climate change concerns no excuse for methane rules

The White House web site explains<sup>20</sup> the Obama administration's excuse for draconian measures to reduce methane emissions:

*"Reducing methane emissions is a powerful way to take action on climate change."*

The EPA estimates the costs of their new methane rules will be offset by \$690 million a year in savings by 2025 from averting severe storms, floods and other consequences of climate change.

This is ridiculous. Even if it were correct that methane emissions from human activities is an important driver of climate change, EPA regulations are estimated<sup>21</sup> to result in only 0.002°C of global warming by century's end. Such an amount is too small to even be measured, let alone have any impact on climate-related events.

Regardless, this is another of the administration's misleading circular arguments. They are saying, 'we decided methane is a dangerous GHG, so, obviously reducing the level is important.'

But the science does not back any of this. Industry stakeholders and states must highlight the EPA's science mistakes if and when lawsuits are filed against the new methane rules.

English biologist, TH Huxley, a staunch advocate of Charles Darwin's theory of evolution, once said, *"The great tragedy of science – the slaying of a beautiful hypothesis by an ugly fact."* It certainly applies to the hypothesis that human-caused methane emissions are a threat to the climate. ■

### ABOUT THE AUTHORS

Dr Tim Ball is an environmental consultant and former climatology professor at the University of Winnipeg, Manitoba, Canada. He is the author of the 2014 book, *The Deliberate Corruption of Climate Science*<sup>22</sup>. Tom Harris is executive director of the Ottawa, Canada-based *International Climate Science Coalition*<sup>23</sup>.

1. [http://support.edf.org/site/PageServer?pagename=cut\\_pollution\\_from\\_oil\\_and\\_gas\\_industry&utm\\_campaign=meth&utm\\_source=googleplus&utm\\_medium=social-media](http://support.edf.org/site/PageServer?pagename=cut_pollution_from_oil_and_gas_industry&utm_campaign=meth&utm_source=googleplus&utm_medium=social-media)
2. <http://www.onefuture.us/press-release-one-future-statement-new-icf-study/>
3. <https://www.epa.gov/newsreleases/epa-releases-first-ever-standards-cut-methane-emissions-oil-and-gas-sector>
4. <https://www.whitehouse.gov/the-press-office/2016/03/10/us-canada-joint-statement-climate-energy-and-arctic-leadership>
5. <http://www.dentons.com/en/insights/alerts/2016/may/13/obama-methane-regulations-come-into-focus>
6. <http://www.prweb.com/releases/2016/05/prweb13413410.htm>
7. <https://www.heartland.org/h-sterling-burnett>
8. <https://www.epa.gov/newsreleases/epa-releases-first-ever-standards-cut-methane-emissions-oil-and-gas-sector>
9. <https://blog.epa.gov/blog/2016/03/epa-taking-steps-to-cut-methane-emissions-from-existing-oil-and-gas-sources/>
10. <http://www.treasury.govt.nz/publications/research-policy/wp/2005/05-02/19.htm>
11. <https://www3.epa.gov/climatechange/ghgemissions/gwps.html>
12. <http://energyindepth.org/national/new-nasa-study-undercuts-epa-finds-fracking-not-to-blame-for-increased-methane-emissions/>
13. <https://www3.epa.gov/climatechange/ghgemissions/gases/ch4.html>
14. <http://news.bbc.co.uk/1/hi/sci/tech/4604332.stm>
15. <https://www.newscientist.com/article/dn18614-methane-bubbling-out-of-arctic-ocean--but-is-it-new>
16. <http://www.scoop.co.nz/stories/SC0601/S00030.htm>
17. <https://www3.epa.gov/climatechange/science/causes.html>
18. <http://permafrost.su/sites/default/files/Ambio.pdf>
19. <https://wattsupwiththat.com/2015/04/10/new-paper-debunks-permafrost-bomb/>
20. [https://www.whitehouse.gov/sites/default/files/strategy\\_to\\_reduce\\_methane\\_emissions\\_2014-03-28\\_final.pdf](https://www.whitehouse.gov/sites/default/files/strategy_to_reduce_methane_emissions_2014-03-28_final.pdf)
21. <http://www.cato.org/publications/commentary/epa-methane-regulations-are-wasted-energy>
22. [http://www.amazon.com/Deliberate-Corruption-Climate-Science/dp/098887740?ie=UTF8&keywords=tim%20ball%20corruption&qid=1390142974&ref\\_=sr\\_1\\_cc\\_1&s=aps&sr=1-1-catcorr](http://www.amazon.com/Deliberate-Corruption-Climate-Science/dp/098887740?ie=UTF8&keywords=tim%20ball%20corruption&qid=1390142974&ref_=sr_1_cc_1&s=aps&sr=1-1-catcorr)
23. <http://www.climate-scienceinternational.org/>
24. <https://www.ipcc.ch/report/ar5/wg1/>



# Climate science, energy policy, poverty, and Christian faith: how do they connect?

E Calvin Beisner is the Founder and National Spokesman of The Cornwall Alliance for the Stewardship of Creation

In the March 16, 2016, issue of *Forbes* astrophysicist Ethan Siegel's article *The Next Great Global Warming 'Hiatus' is Coming!* sought to refute sceptics of catastrophic anthropogenic global warming (CAGW) by arguing that the apparent lack of statistically significant global warming over roughly the last 18 or 19 years is just one in a series of lulls in a long-term warming trend for which human action is responsible.

His article, deftly argued and accompanied by stunning graphs, is one of the best defenses of fears of CAGW I've seen in major media, so I'd like to begin by responding to it at some length.

Siegel begins with two frightening graphs (Figures 1 and 2), the first showing that during the first half of March most of North America was about 4.2°C warmer than the 1981–2010 average, and the second showing that for December 2015 through February 2016 the surface temperature of much of the world was warmer than at any time in the previous 67 years.

Scientists who believe in CAGW routinely use these sorts of images to generate fears. (The scary colours certainly help but are of purely emotional, not rational, value. Consider what

happens if we turn that last graph from colour to grey scale—Figure 3).

Doesn't look nearly so scary, does it? I'm not arguing that colors shouldn't be used—just pointing out that viewers need to distinguish between the emotional effect of alarming colors like the reds in this graph and the rational information being conveyed—and perhaps amplified.

But Siegel seems to undercut these graphs by explaining:

*"The first thing we have to realize is that there are two things at play here: long-term trends, which is the gradual warming we're seeing over generational timescales, and short-term variations, which are due to things like the seasons, volcanic eruptions, and weather events like El Niño and La Niña. The record-breaking temperatures we're seeing across the globe are due to a combination of all the short-term and long-term variations superimposed atop one another, and so although February of 2016 was the hottest month ever recorded (note: don't think this means through all human history. We haven't been recording global temperature directly for more than about a century or very well for more than about 38 years—and the proxy temperature measurements going back farther give pretty good*

Figure 1. CONUS temp anomaly March 2016

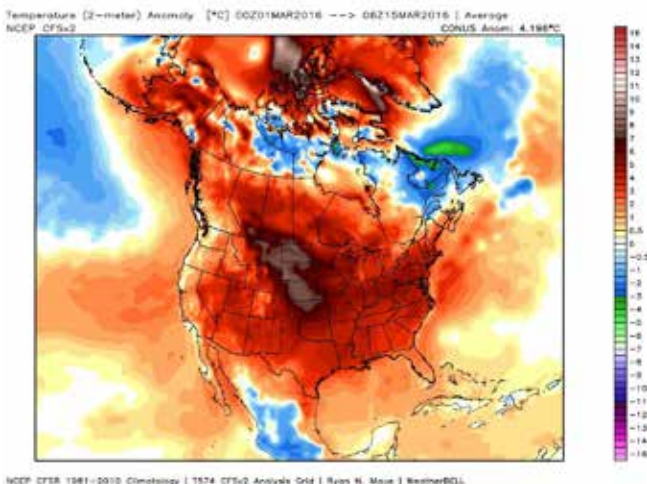
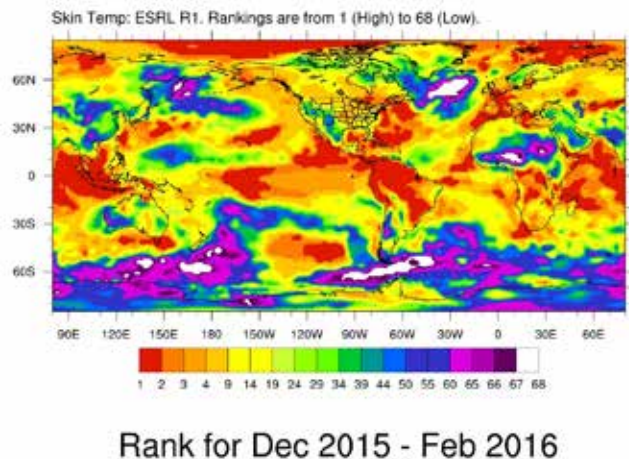


Figure 2. Skin temp rankings





evidence that, eg, the Medieval Warm Period was warmer than today. But to return to Siegel's words:) *although last month ... was the hottest month ever recorded, that isn't necessarily a reason to freak out. You see, we're currently experiencing an El Niño event.*

*... This peak in temperatures that we're seeing now, the one that spans from 2015–2016, isn't due to global warming. That is to say, most of the anomalously high temperatures we're seeing are due to these short-term variations."*

Isn't that reassuring? Siegel is no alarmist, is he? Maybe he even rejects alarmism.

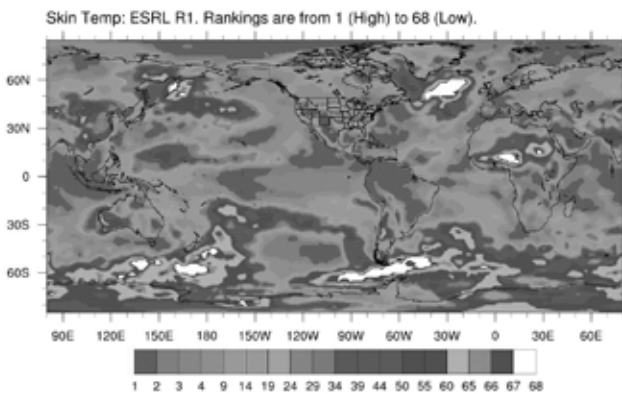
Don't be too quick to breathe a sigh of relief. He immediately adds:

*"But what should be far more concerning to anyone who wants to know the truth about climate change is this: the long-term rise in temperatures is continuing at a steady rate. The fact that temperatures appear to be rising at a rate of between 0.40–0.80°C (0.72–1.44°F) per century, unabated, is the real cause for concern. That's what global warming really is, the slow, long-term rise in temperatures. That's also the component that humans—through emissions reduction, energy efficiency, renewable power, policy changes and (possibly) geo-engineering—can do something about."*

Before we go further, let me point out that a rate of change in global average temperature of 0.4–0.8°C per century is remarkably small. On any given day in most locales, the difference between high and low temperature is ten to twenty times that, and in any given year in most locales, the difference between summer and winter highs or summer and winter lows is twenty to forty or more times that—which is why my good friend Dr Richard Lindzen, who is Alfred P Sloan Professor of Meteorology, Emeritus, at Massachusetts Institute of Technology, says the proper response to the entire roughly 0.8–1.0°C increase in global average temperature since 1880 is "So what?"

Now let's get to the point of Siegel's title, *The Next Great Global Warming 'Hiatus' is Coming!* That title is a jab at sceptics

**Figure 3. Skin temp rankings, grey scale**



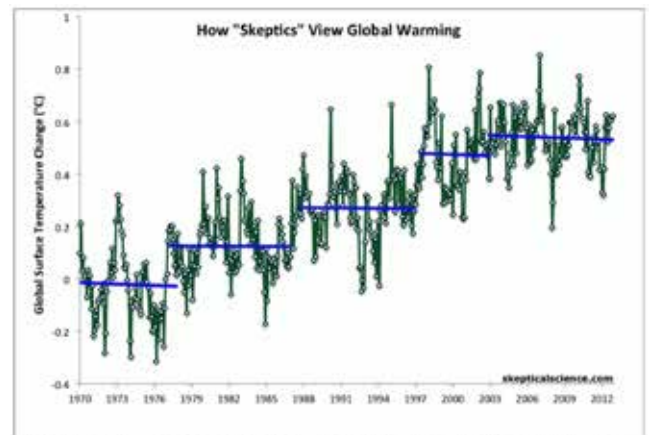
**Rank for Dec 2015 - Feb 2016**

of CAGW. Siegel warns readers that since the record-breaking temperatures of the last few months (which will probably continue for a good part of this year before El Niño peters out) will soon be followed by the cooling caused by La Niña (which normally follows), sceptics will immediately start claiming that global warming has stopped—or at least paused—since it could well be a decade or two, or three, before the long-term warming, with another unusually strong El Niño superimposed on it, brings us to new record highs.

He illustrates his point powerfully with an animated graph (from the website SkepticalScience.com) showing the difference between how what he calls 'sceptics' (He should be credited for using this nicer term than 'deniers,' which rhetorically associates those who question CAGW with those who deny the Holocaust) view global warming and how what he calls 'realists' (which kind of presupposes something, does it not?) view global warming (Figure 5).

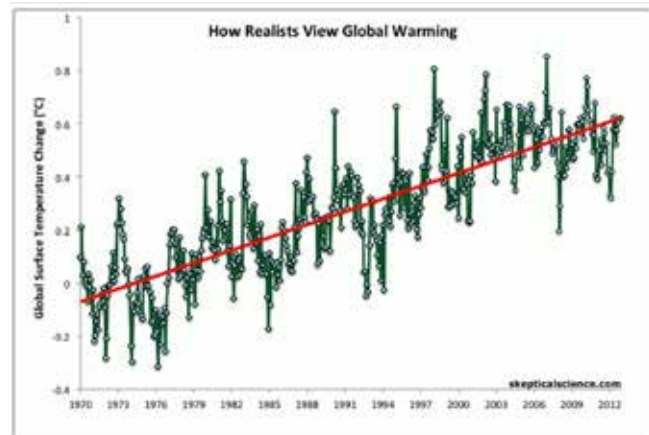
Look back and forth between those a few times so their message sinks in. In both, the green lines with circles in them show the average annual global surface temperatures according to five widely recognized sources. In the first graph (Figure 4), 'How 'Skeptics' View Global Warming,' the nearly level (and sometimes even downward-sloping) blue lines show the pauses in global warming, and according to Siegel the sceptics point to any given pause as evidence that global warming has stopped. (Actually, most don't but argue from

**Figure 4. How 'Skeptics' View Global Warming**



Average of NOAA OISST V2, NOAA SST.v2, and JRA50v2's monthly global surface temperature anomalies from January 1970 through November 2015 (green) with three trends applied to the data (January 1970 - Oct 77, April 78 - Dec 88, Sep 89 - Nov 98, Jan 99 - Dec 10, and Dec 10 - Dec 12, image credit: Skeptical Science at <http://www.skepticalscience.com/the-global-warming-pause-misconception.html>)

**Figure 5. How Realists View Global Warming**



Average of NOAA OISST V2, NOAA SST.v2, and JRA50v2's monthly global surface temperature anomalies from January 1970 through November 2015 (green) with three trends applied to the data (January 1970 - Oct 77, April 78 - Dec 88, Sep 89 - Nov 98, Jan 99 - Dec 10, and Dec 10 - Dec 12, image credit: Skeptical Science at <http://www.skepticalscience.com/the-global-warming-pause-misconception.html>)

them in a different way that I'll discuss shortly.) But as the red line in the second graph (Figure 5), 'How Realists View Global Warming,' shows, the long-term trend is clearly upward, and the pauses are really just that—pauses; none of them is a cessation.

(By the way, notice the scare quotes around 'Sceptics,' but the absence of any around 'Realists'? That's another rhetorical trick designed to shift your thinking without persuading you—just like calling his side 'realists,' for of course no one wants to question reality.)

Obviously, the long-term warming continues, despite the short-term pauses. Siegel then warns that "prominent climatologists ... have made these arguments before ([and] will likely make [them] again), and they will be quoted in a great many news outlets and by numerous science writers." But then he advises: "If you see an article that cites one of them claiming global warming has stopped and it isn't yet 2033, the 17 years from now that we're required to wait to see if the rise continues, please refer them back to this article."

Convinced? Siegel thinks you should be, so he concludes: "the fact that the global average temperature is rising—and that it continues to rise—is a real long-term problem facing the entire world. Don't let dishonest arguments"—(How does Siegel know they're dishonest? How does he know they're not because these 'prominent climatologists' disagree with his interpretation of the data?)—"Don't let dishonest arguments that gloss over the actual issue dissuade you from the scientific facts. We can fool ourselves into believing that there isn't a problem until it's too late to do anything about it, or we can own up to what the science tells us, and face this problem with the full force of human ingenuity. The choice is ours."

Yes, we do have some choices to make. But before we make them, I'd like to do a little testing of Siegel's reasoning—which is quite representative of that by CAGW advocates generally.

Let's begin by considering his caveat: "If you see an article ... claiming global warming has stopped and it isn't yet 2033, the 17 years from now that we're required to wait to see if the rise continues, please refer them back to this article." Siegel thinks a 17-year pause can fit comfortably in with the theory of CAGW—which is that human emissions of CO<sub>2</sub> are driving dangerous global warming. There are some problems with that.

**Figure 6. No global warming 18 years 9 months**



The first problem is that the least-squares linear regression of satellite global temperature data showed no global warming from February 1997 through October 2015, 18

years and 9 months (Figure 6). That's more than 50% longer than the roughly twelve years shown in the last pause of the *How 'Sceptics' View Global Warming* graph Siegel used, and about 10% longer than the 17 years Siegel thinks would be consistent with the theory.

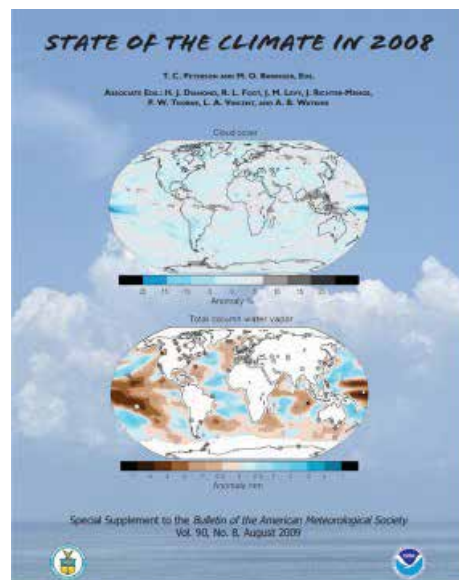
The current short-term warming Siegel attributes to El Niño (and others attribute in part also to a reversal of the Pacific Decadal Oscillation from negative to positive—the two combined making for even more warming) has shortened the 'pause,' as illustrated in this graph, to 18 years and 8 months<sup>2</sup> (June 1997–January 2016, Figure 7) and will shorten it further as El Niño's influence continues, but the fact remains that at its maximum the period without warming significantly exceeded 17 years.

**Figure 7. No global warming 18 years 8 months**



The second problem is that even climate scientists who embrace CAGW previously admitted that a period of just 15 years without warming would be difficult if not impossible to reconcile with the theory. In its *State of the Climate*<sup>3</sup> in 2008 the National Atmospheric and Oceanic Administration stated, "Near-zero and even negative trends are common for intervals of a decade or less in the simulations, due to the model's internal climate variability. The simulations rule out (at the 95% level) zero trends for intervals of 15 years or more, suggesting that an observed absence of warming of this duration is needed to create a discrepancy with the expected present-day warming rate" (emphasis added, Figure 8).

**Figure 8. State of the Climate 2008, 'Near-zero and even negative'**



Likewise, Phil Jones, Director of the Climate Research Unit at the University of East Anglia, said in an email to a colleague in 2009<sup>4</sup>, “Bottom line: the ‘no upward trend’ has to continue for a total of 15 years before we get worried.” So where did Siegel come up with 17 years?

The third problem is that the periods with and without warming over the last 40 years or so are about equal in length, which suggests that if the periods without warming aren’t sufficient to invalidate the climate models, neither are the periods with warming sufficient to validate them.

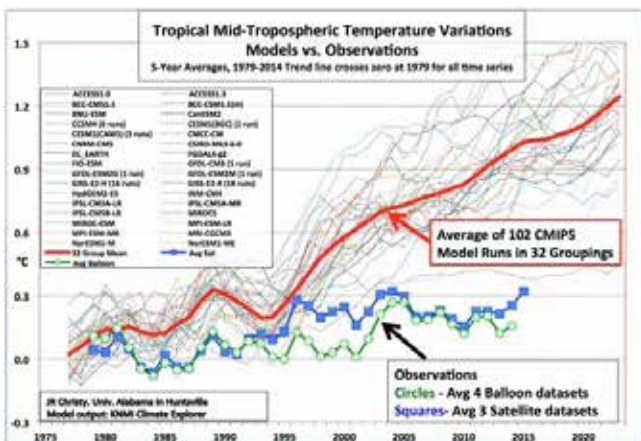
Now let’s go back to what I consider the most important paragraph of Siegel’s article: “The fact that temperatures appear to be rising at a rate of between 0.40–0.80°C (0.72–1.44°F) per century, unabated, is the real cause for concern. That’s what global warming really is, the slow, long-term rise in temperatures. That’s also the component that humans—through emissions reduction, energy efficiency, renewable power, policy changes and (possibly) geo-engineering—can do something about.”

In short, Siegel recommends that we “do something about” this long-term temperature rise “through emission reductions, energy efficiency, renewable power, policy changes and (possibly) geo-engineering.”

I will address his prescription later, but it’s time now to consider a very intriguing fact. Without acknowledging it, Siegel implicitly gives away the store when he says, “temperatures appear to be rising at a rate of between 0.40–0.80°C (0.72–1.44°F) per century, unabated.” Ignore for the moment his saying the rise is ‘at a steady rate’ or ‘unabated,’ when the pauses even in the graph he offers of *How ‘Skeptics’ View Global Warming* show clearly that it is not steady but regularly abated. The key is in the rate he affirms: “between 0.40–0.80°C per century.”

How does this give away the store? The computer climate models on which the United Nations Intergovernmental Panel on Climate Change (IPCC), various national agencies, and various climate-change advocacy groups rely for their forecasts of anthropogenic global warming dangerous enough to justify abatement policies costing hundreds of billions to trillions of dollars predict that global average temperature should be rising at a rate of about 0.214°C per decade, ie, about 2.14°C per century. (And that’s only the warming that should be coming from human emissions of CO<sub>2</sub>; if any of the long-term warming trend is natural, the combined trend should be even higher.)

**Figure 9. Tropical Mid-Tropospheric Temperature Variations Models vs Observations**



“... the overwhelming majority of the simulations depicts more than twice the warming actually observed”

But as climatologist John Christy of the University of Alabama, one of the best known of the ‘sceptics,’ has shown, the actually observed warming rate is about 0.079°C (according to weather balloon data) to 0.091°C (according to satellite data) per decade, or about 0.79°C to 0.91°C per century.

Figure 9 shows the projections for mid-tropospheric temperature variations by 102 climate models, grouped into 32 groups in the dotted lines and as an overall average in the thick red line. It also shows the annual average of four weather balloon datasets in the green line with circles, and of three satellite datasets in the blue line with squares. All the data are graphed so that the trend lines meet at zero in 1979. As you can see, the model projections diverge rapidly from the observations in the early 1980s; from 1995 to about 2000 they rarely intersect the observations; and from 2000 onward they never intersect the observations.

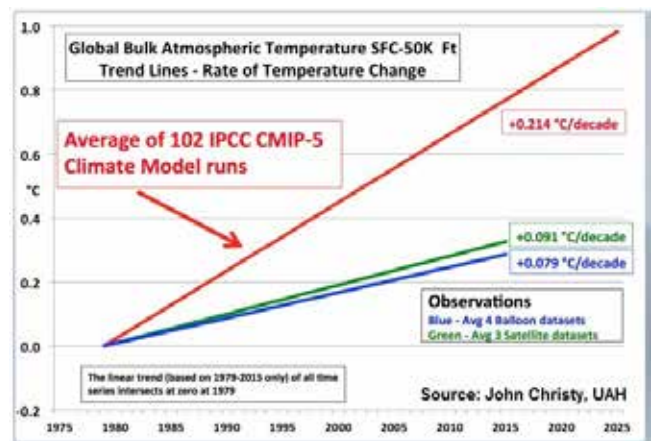
Figure 10 shows the same data plotted as straight-line trends. The red line shows the average of the 102 computer models, the blue line the observations by weather balloons, and the green line the observations by satellites.

As these graphs show, the models predict about 2.4 to 2.7 times as much warming as the satellite and balloon data show.

As an aside, let me point out, in case you’re concerned because Christy’s data are for the mid-troposphere while Siegel’s are for surface temperatures, that according to greenhouse warming theory, the mid-troposphere should warm more than the surface, so these data don’t imply underestimates of surface warming trends.

Now, what warming rate did Siegel say is a “real cause for concern ... that humans ... can do something about”? 0.4 to 0.8°C per century, or 0.04°C to 0.08°C per decade, based on surface temperature readings.

**Figure 10. Global Bulk Atmospheric Temperature**



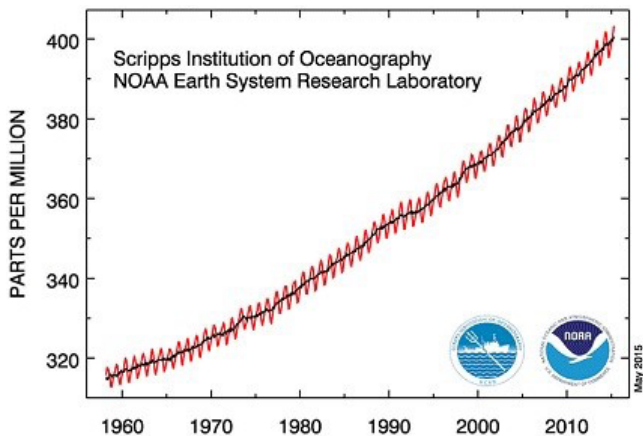
The computer models predict, on average, about 2.8 times as much warming as Siegel's upper-end estimate of the observed long-term warming rate, and 5.4 times as much warming as his lower-end estimate.

Furthermore, Siegel's lower-end estimate of the observed warming rate, 0.04°C per decade, is about half the balloon estimate of 0.079°C per decade, and his upper-end estimate, 0.08°C per decade, is about nine-tenths of the satellite estimate of 0.091°C per decade.

In short, Siegel's estimates of the actual warming rate are more sceptical than the 'skeptics' estimates!

Now let me back up to one of Siegel's claims that I told you a little bit ago to ignore for a moment: that the observed warming has been at 'a steady rate,' 'unabated.' As I said then, the nearly flat blue lines in the graph he offers labeled *How 'Skeptics' View Global Warming* show that the warming is not steady but is regularly abated. But that's not the only problem. The claim by those who believe in CAGW is that human emissions of CO<sub>2</sub> have caused most of the global warming since about 1960. If CO<sub>2</sub> is the primary driver, the temperature trend should follow it closely. But here's what atmospheric CO<sub>2</sub> concentration has done (Figure 11):

**Figure 11. Atmospheric CO<sub>2</sub> at Mauna Loa Observatory**



The red squiggly line shows the seasonal variation (because CO<sub>2</sub> concentration rises in the Northern Hemisphere's winter as plants go dormant and absorb less, and falls in summer as plants grow and absorb more), and the black line shows the smoothed average. What is clear is that CO<sub>2</sub>'s rise has been—shall we say, borrowing Siegel's words that inaccurately described global average temperature—'steady' and 'unabated,' not intermittent, like temperature's.

In short, while the correlation between CO<sub>2</sub> and temperature over the entire time is reasonably close, CO<sub>2</sub>'s curve does not show the intermittency that the temperature data show, which means the correlation is poor.

But poor does not equal nonexistent. There is in fact a correlation between atmospheric CO<sub>2</sub> concentration and global average temperature. The problem for those who, like Siegel, insist that our CO<sub>2</sub> emissions are the primary driver of global warming over the last half century or so is that the sequence is the opposite of what it should be for that theory to be true: temperature leads CO<sub>2</sub> rather than vice versa.

**Figure 12. Global CO<sub>2</sub>, GISS and HadSST2**

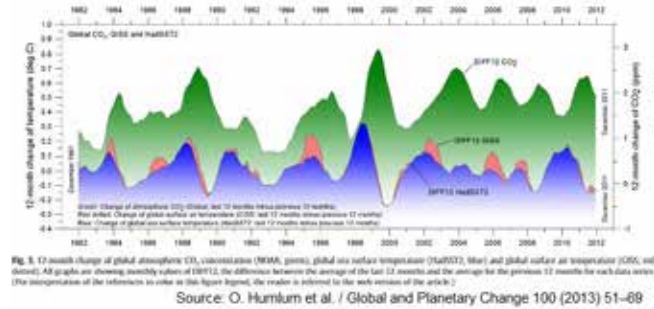


Fig. 8. 12-month change of global atmospheric CO<sub>2</sub> concentration (NMAA, green), global sea surface temperature (HadSST2, blue) and global surface air temperature (GISS, red). All graphs are showing monthly values of HadSST2, the difference between the average of the last 12 months and the average for the previous 12 months for each data series. (The magnification of the reference is also in this figure legend, the reader is referred to the main content of the article.) Source: O. Humlum et al. / Global and Planetary Change 100 (2013) 51–69

Over very long time scales (measured in hundreds of thousands to millions of years), a study of Antarctic ice cores dating back 270,000 years published in *Science* in 1999<sup>5</sup> by H Fischer, et al. found that CO<sub>2</sub> concentrations lagged temperature by from 200 to 1,000 years. But what about shorter time scales? As illustrated in Figure 12, a study by O Humlum et al.<sup>6</sup> published in *Global and Planetary Change* in 2013 examining the lags and leads between a number of annually averaged variables including

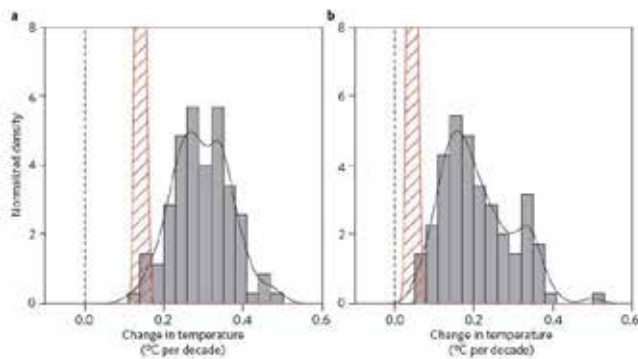
1. surface air temperature from the Climatic Research Unit of the University of East Anglia and the Hadley Centre,
2. surface air temperature data from the Goddard Institute for Space Studies,
3. surface air temperature data from the US National Climatic Data Center,
4. sea surface temperature data from the Hadley Centre,
5. lower troposphere air temperature data from the University of Alabama–Huntsville,
6. globally averaged marine CO<sub>2</sub> data,
7. data on anthropogenic releases of CO<sub>2</sub> from the Carbon Dioxide Information and Analysis Center, and
8. global warming potential data on volcanic eruptions

concluded that "changes in the amount of atmospheric CO<sub>2</sub> always [lag] behind corresponding changes in air temperature," with "the maximum positive correlation between CO<sub>2</sub> and temperature ... found for CO<sub>2</sub> lagging 11–12 months in relation to global sea surface temperature, 9.5–10 months to global surface air temperature, and about 9 months to global lower troposphere temperature."

Moreover, as Cornwall Alliance Senior Fellow and University of Delaware climatology professor David Legates explains<sup>7</sup> in commenting on those studies, changes in ocean temperatures are good predictors of the observed changes in atmospheric CO<sub>2</sub> (because seawater releases CO<sub>2</sub> as it warms and sequesters it as it cools) while CO<sub>2</sub> released from anthropogenic sources is not well correlated with changes in total atmospheric CO<sub>2</sub>.

I will conclude this portion of my article with the observation that, as shown in Figure 13<sup>8</sup>, climate models 'run hot.' The grey bars are based on 117 model simulations, and the black curves are smoothed versions of their simulated trends. The red hatching depicts observed trends from 100 reconstructions of the HadCRUT4 global temperature dataset. The left graph covers 1993–2012, in which only two of the grey bars fall within the red hatching. The right graph covers the shorter period 1998–2012, while only one grey bar falls within the red hatching.

**Figure 13. Trends in global mean surface temperature, 1993-2012 and 1998-2012**



**Figure 13** Trends in global mean surface temperature. **a.** 1993-2012. **b.** 1998-2012. Histograms of observed trends (red hatching) are from 100 reconstructions of the HadCRUT4 dataset. Histograms of model trends (grey bars) are based on 117 simulations of the models, and black curves are smoothed versions of the model trends. The ranges of observed trends reflect observational uncertainty, whereas the ranges of model trends reflect forcing uncertainty, as well as differences in individual model responses to external forcings and uncertainty arising from internal climate variability. Source: IPCC

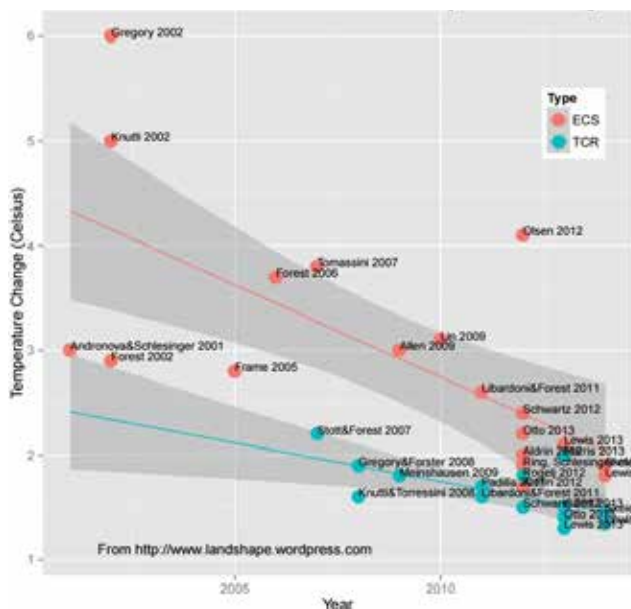
Reproduced from Fyfe, Gillett, and Zwiiers, "Overestimated global warming over the past 20 years." *Nature Climate Change* 3, 767-709 (2013).

As we saw earlier with the comparison of model simulations to satellite and weather balloon observations, the overwhelming majority of the simulations depicts more than twice the warming actually observed.

Nobel Prize-winning physicist Richard Feynman explained 'the key to science' this way:

*In general we look for a new law by the following process. First we guess it. Then we compute the consequences of the guess to see what would be implied if this law that we guessed is right. Then we compare the result of the computation to nature, with experiment or experience, compare it directly with observation, to see if it works. If it disagrees with experiment it is wrong.*

**Figure 14. Published Measurements of Climate Sensitivity to CO<sub>2</sub> Doubling**



From <http://www.landshape.wordpress.com>

*In that simple statement is the key to science. It does not make any difference how beautiful your guess is. It does not make any difference how smart you are, who made the guess, or what his name is—if it disagrees with experiment it is wrong. That is all there is to it.*

This is why more and more climate scientists around the world are reassessing just how much warming should come from CO<sub>2</sub> added to the atmosphere. The term for this is climate sensitivity, which climate scientists define as the amount that global average temperature should rise in response to doubled atmospheric CO<sub>2</sub> concentration. Whereas the IPCC has, since 1988, estimated climate sensitivity at 1.5–4.5°C with 3°C as 'best estimate,' based on models, climate scientists incorporating increasing empirical data are offering significantly lower estimates, as Figure 14 shows.

The blue dots represent estimates of transient climate response (TCR), that is, temperature change at the time of CO<sub>2</sub> doubling. The red dots represent estimates of equilibrium climate sensitivity (ECS), that is, temperature change from doubled CO<sub>2</sub> at equilibrium, after all climate feedbacks have been accounted for, which is generally estimated to take a century or more. As you can see, later estimates of both ECS and TCR are significantly lower than earlier estimates.

Keep in mind that the last of those studies was published in 2013. After that the 'pause' in global warming extended through two more years, offering additional reason to reduce both TCR and ECS estimates. As the Cornwall Alliance pointed out in *A Call to Truth, Prudence, and Protection of the Poor 2014: The Case against Harmful Climate Policies Gets Stronger*<sup>9</sup>, "Newer, observationally based estimates have ranges like 0.3°C to 1.0°C (NIPCC 2013a, p. 7) or 1.25°C to 3.0°C with a best estimate of 1.75°C (Lewis and Crok 2013, p. 9)."

I'll conclude this portion of my presentation this way: I think it's highly likely that adding CO<sub>2</sub> to the atmosphere will make global average temperature warmer than it otherwise would be, all other things being equal, but I think the magnitude of the warming will be much less—most likely in the range of one-third to one-half, but perhaps even as little as one-sixth—that predicted by the IPCC and other advocates of CAGW.

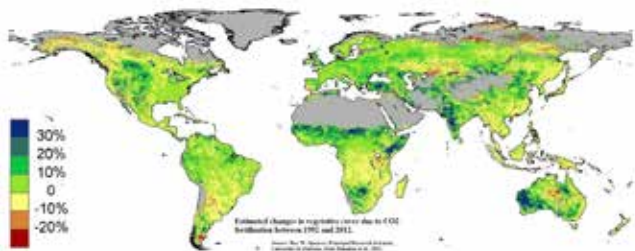
Because

- on average the computer climate models on which advocates of CAGW depend simulate two to three times the actually observed warming, and because
- over 95% simulate more warming than observed (which implies that the errors are not random, in which case they'd be equally often and equally much below as above, but rather are driven by some kind of bias, whether honest mistake or dishonest fudging, written right into the models), and because
- none of the models predicted the nearly 19-year absence of statistically significant global warming starting in early 1997,

we can safely conclude that the models are invalidated. This in turn means they provide no rational basis for predictions about future temperature or anything dependent on it—whether extreme weather events, rate of sea level rise, or changes in ecosystems or the human economy. And that in turn means they provide no rational basis for any policy in response to any such predictions.

At the same time, however, literally thousands of empirical—not modeling—studies reveal that adding CO<sub>2</sub> to the atmosphere has tremendous beneficial effects for all living things. On average, for every doubling of CO<sub>2</sub> concentration in the atmosphere, there is a 35% increase in plant growth efficiency. Plants grow better in warmer and colder temperatures and in wetter and drier soils, make better use of soil nutrients, and resist diseases and pests better, widening their ranges and, as shown in Figure 15, greening the planet. They improve their fruit-to-fibre ratio.

**Figure 15. Estimated changes in vegetative cover due to CO<sub>2</sub> fertilization between 1992 and 2012**



The result is more food for everything that eats plants—and everything that eats things that eat plants. Estimates of increased agricultural productivity due to the CO<sub>2</sub> we've added to the atmosphere since about 1950 range from about 11% to 15%, with added crop value since 1960 estimated at about \$3.2 trillion<sup>10</sup>. Who benefits most from this? The world's poor, who are most vulnerable to high food prices and benefit most from declining food prices.

So it is not only all the direct benefits of the energy we produce from fossil fuels—energy to light our homes and workplaces, to operate all our transport and communications systems, to run our hospitals, factories, and refrigerators, indeed almost everything we do all day every day—it is not only all those direct benefits but also the indirect benefit of the biological enhancement from rising atmospheric CO<sub>2</sub> that we owe to our use of fossil fuels. Any alleged costs from CO<sub>2</sub>'s influence on climate must be balanced against such gains, and any alleged climate-related benefits of reducing our CO<sub>2</sub> emissions must be balanced against the reduction of these benefits.

This brings us to another aspect of this controversy—the one that, because of the Bible's insistence on helping and protecting the poor, motivates my work in this field: the wisdom of policies prescribed to mitigate anthropogenic global warming. All of those policies emphasize the need to reduce CO<sub>2</sub> emissions, and all call for us to do that by 'decarbonizing' the world's energy systems—substituting renewable energy sources, especially wind and solar, for hydrocarbon, otherwise known as fossil, fuels.

I'm going to begin this discussion by asking you what you might think is a rather strange question: how many calories do you consume each day? If you're about average for Americans, your answer was probably about 2,700. And if it was, you're way off. Actually, the average American consumes about 186,000 calories per day.

Impossible, you say? Only if you count only food intake. But calories are measures of energy, and most of the calories we consume don't come from food. They come from the energy

we use when we turn on a light or computer, drive our cars, use our cell phones, or do pretty much anything else. Add that all up and, for the average American, it comes to about 186,000 calories per day—about 60 times as many calories as we get from food. And 98% of that energy is in the form of machine power. It serves us, minute by minute, uncomplaining, and it is largely responsible for the fact that Americans born today can expect to live nearly three times as long as their ancestors born before the Industrial Revolution.

Very few—perhaps 1 in 100—of our ancestors consumed that much energy in a day, and for them very little of it was in the form of machine power. It was instead mostly in the form of animal and slave labour. The animals and slaves got their energy from food. And in those days, average daily calorie intake from food per person was probably under 2,000, meaning that for anyone to benefit from 186,000 calories of energy per day required harnessing the energy equivalent, and the production equivalent, of about 93 slaves.

Today, instead, we get most of our energy from fossil fuels. Worldwide, about 87% of all energy consumed comes from fossil fuels, and most of the remainder from hydro (about 7%) and nuclear (4%). Harnessing energy through machines instead of animals and slaves enables us to benefit from a level of energy consumption that only a tiny minority had three centuries ago—even while abolishing slavery.

What this means is that the energy we derive from fossil fuels provides two great moral benefits: first, about 87% of all the products and services that give us longer, healthier lives than our ancestors, and second, the elimination of the demand for slave labour. That's right: energy from fossil fuels played an integral role in the elimination of slavery from Western civilization.

Today, however, environmentalists call our use of fossil fuels an 'addiction' analogous to smoking tobacco or taking hallucinogenic drugs. They warn that by obtaining energy from coal, oil, and natural gas, we're causing dangerous global warming—a claim I've just argued is at best grossly exaggerated. They demand that we curtail that use—even stop it completely, even at a cost of literally trillions of dollars that otherwise be spent far more efficiently to reduce hunger and disease and increase education, health care, and other benefits worldwide.

One might as well demand that the average person cut his food intake from 2,700 calories a day to 300 because the other 2,400 are his 'addiction' to food. Abundant, affordable, reliable energy is indispensable to lifting and keeping whole societies out of poverty, and fossil fuels are and for decades to come will remain, along with nuclear and hydro, the best sources.

The ministry I lead, the Cornwall Alliance for the Stewardship of Creation, has just published a new edition of the excellent study *Fossil Fuels: The Moral Case*. In it my friend Kathleen Hartnett White, former chairman and commissioner of the Texas Commission on Environmental Quality, traces some of the benefits that come from fossil fuels.

Don't misunderstand me. As my friend Dr William Happer, Cyrus Fogg Brackett Professor of Physics at Princeton, Emeritus, and former Director of the US Department of Energy's Office of Science, notes in a forthcoming paper, "fossil

fuels must be extracted responsibly, minimizing environmental damage from mining and drilling operations, and with due consideration of costs and benefits. Similarly, fossil fuels must be burned responsibly, deploying cost-effective technologies that minimize emissions of real pollutants such as fly ash, carbon monoxide, oxides of sulphur and nitrogen, heavy metals, volatile organic compounds, etc.” Those are the real risks from fossil fuels, and in developed countries we apply technologies that minimize them to the point where their risks are negligible and certainly aren’t enough to counterbalance the benefits of the energy we generate.

But carbon dioxide (safe for humans for long periods at 5,000 parts per million, exhaled by humans at 40,000 parts per million, and now at about 400 parts per million in the atmosphere as a whole) is not a pollutant, and because human material wellbeing depends heavily on access to abundant, affordable, reliable energy, and because fossil fuels are and for the foreseeable future will continue to be, along with nuclear and hydro, our best source of such energy, the demand to reduce our use of fossil fuels to reduce our CO<sub>2</sub> emissions to reduce man-made global warming amounts to a demand to reduce human material wellbeing—which I believe is immoral.

Consider six graphs, all constructed at the marvellous Gapminder World website using World Bank, International Monetary Fund, United Nations, and other official data, demonstrating the relationship between hydrocarbon fuel use and three measures of human wellbeing: infant and child mortality, human life expectancy, and income per capita.

**Figure 16. CO<sub>2</sub> emissions per person indexed against child mortality, 1940**



**Figure 17. CO<sub>2</sub> emissions per person indexed against child mortality, 2009**



Figure 16 graphs CO<sub>2</sub> emissions per person against child mortality in 1940. Each circle represents a country, the sizes indicating relative population, and the colours representing GDP per capita by nation—yellow being high, green upper middle, red lower middle, blue low, and colourless not categorized. The higher a circle falls on the scale, the higher the per capita emissions of CO<sub>2</sub>. The farther to the right a circle falls, the higher the child mortality rate.

In 1940, for the vast majority of the world’s people, CO<sub>2</sub> emissions clustered under one-half ton per capita, and child mortality rates clustered between 200 and 400 deaths by age 5 per 1,000 born. Higher emissions, lower child mortality rates, and higher income levels clearly correlate.

Sixty-nine years later, the circles have shifted to the left, showing declining child mortality rates; they have also shifted upward, showing rising CO<sub>2</sub> emissions (Figure 17). In 2009, for the vast majority of the world’s people, CO<sub>2</sub> emissions cluster between 2 and 10 tons per capita (4 to 40 times the 1940 levels), and child mortality rates cluster between 20 and 60 deaths by age 5 per 1,000 born (about one-third to one-twentieth the 1940 rates) Higher emissions, lower child mortality rates, and higher income levels clearly correlate.

Now we’ll compare 1940 and 2009 measures of human life expectancy. Here the circles’ horizontal location represents life expectancy. In 1940, for the vast majority of the world’s people, when CO<sub>2</sub> emissions, we remember, clustered under one-half ton per capita, life expectancy clustered between 25 and 40 years (Figure 18).

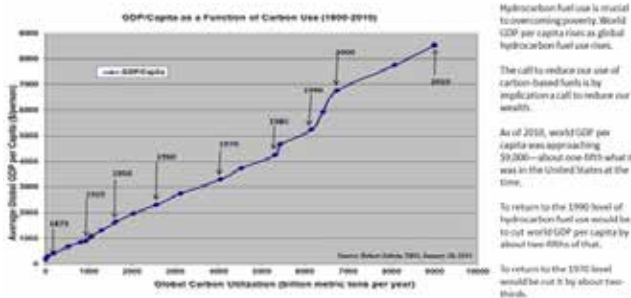
**Figure 18. CO<sub>2</sub> emissions per capita indexed against life expectancy, 1940**



**Figure 19. CO<sub>2</sub> emissions per capita indexed against life expectancy, 2009**



**Figure 20. GDP per capita as a function of carbon use 1800-2010**



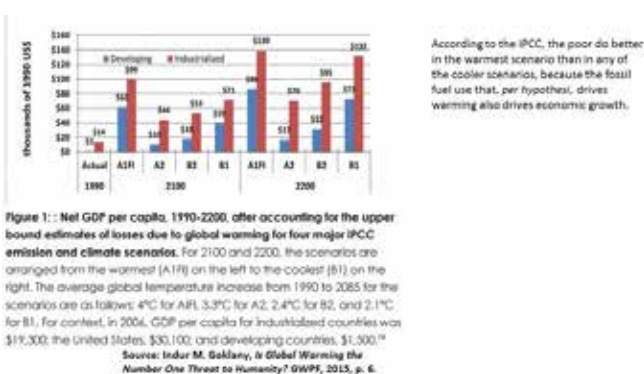
In 2009, for the vast majority of the world's people, with CO<sub>2</sub> emissions 4 to 40 times higher, life expectancy clusters between 65 and 75 years—about 60 to 300 percent higher than in 1940 (Figure 19). Higher emissions, higher life expectancy, and income levels clearly correlate.

Figure 20 shows GDP per capita, on the vertical scale, as a function of hydrocarbon fuel use, on the horizontal scale, from 1800 to 2010. If we value human material wellbeing, we want to see GDP per capita rising; it does so only as hydrocarbon fuel use also rises.

The call to reduce our use of carbon-based fuels is by implication a call to reduce our wealth. As of 2010, world GDP per capita was approaching \$9,000—about one-fifth what it was in the United States at the time. To return to the 1990 level of hydrocarbon fuel use would be to cut world GDP per capita by about two-fifths of that. To return to the 1970 level would be to cut it by about two-thirds. And the cuts in GDP per capita would bring proportionate increases in infant and child mortality and declines in life expectancy, as well as other losses to human wellbeing.

As we see in Figure 21, according to the IPCC's coupled climate and economic modelling, the world's poorer nations measured by per capita income are expected to become richest at the end of this century and the next under the warmest scenario. Why does that happen? Because the climate models derive the magnitude of warming from the amount of economic growth, and they (safely) assume the economic growth to be driven primarily by fossil fuel use; the lower the fossil fuel

**Figure 21. Net GDP per capita, 1990-2200**



use (ie, the more successful the efforts to mitigate warming by reducing CO<sub>2</sub> emissions), the lower the economic growth, and vice versa, the higher the fossil fuel use, the higher the economic growth.

In other words, even according to the IPCC's own modelling, assuming high 'climate sensitivity' (how much warming comes from added CO<sub>2</sub>) even though as we have seen empirical observation increasingly points to low 'climate sensitivity,' fighting global warming does more harm than good as measured by income per capita.

As an aside, here's an ethical point to consider. Under all the IPCC's scenarios, future generations are wealthier than the present generation. Calling for people today to bear the burden of trillions of dollars' worth of climate mitigation by decarbonizing their energy systems means asking the poorer of today to sacrifice for the sake of the richer of tomorrow.

Why is it so important to consider the impact of CO<sub>2</sub> reductions on economies? Because of this simple insight: The wealthier you are, the more different climates in which you can thrive, and the better able you are to survive extreme weather.

The corollary is that the poorer you are, the less able you are to thrive in any climate, or to survive any extreme weather event. If your income is even equivalent to today's lower-middle-class in America, you can live a healthy, safe, long life in any climate from the Arctic Circle to the Sahara Desert or the Brazilian rainforest. If you're poor, you can't thrive in the most idyllic tropical paradise.

These insights yield this implication: Since abundant, affordable, reliable energy promotes wealth, and nuclear and fossil fuels are now and for the foreseeable future will be our best sources of said energy, those sources enhance human thriving and survival, and human thriving and survival are reduced proportionate to the reduction in humans' use of them.

As my friend John Christy, a climatologist at the University of Alabama and former missionary in Kenya, explains, the primitive energy system dominant among the world's poorest 1.3 or so billion people works this way: the average woman in sub-Saharan Africa spends 6 to 8 hours per day gathering wood and dung as her primary cooking and heating fuel, leaving her precious little time and bodily energy for other productive activities to lift herself and her children out of poverty. Smoke from that kills about 4 million a year, mostly women and children, and debilitates hundreds of millions for varying periods and at varying degrees, because it causes upper respiratory diseases and eye infections.

The poor of this world desperately need to replace that primitive energy system with the modern one in which coal, natural gas, and nuclear materials are used to generate clean electricity delivered at scale (meaning in utterly enormous quantities), on demand (meaning it's there, every time, instantly, when you need it), without interruption (meaning with no brownouts or blackouts), through grids not only for cooking and heating but also for light and refrigeration and automated clothes washing and drying and computing and industry and business and commerce and health care.

Some people will respond to all of this by saying, "I understand that energy is important to lifting and keeping people out of

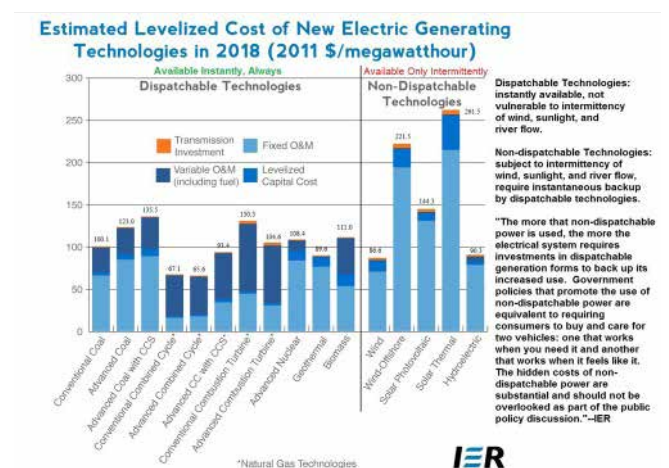




poverty, but why does it have to be fossil fuel energy? Why not power our grids with wind, solar, and biofuels to minimize global warming?" The answer is magnitude, cost, and dependability. It's not just that we need energy. It's that we need abundant, affordable, reliable energy.

As this chart from the Institute for Energy Research shows (Figure 22), it is less expensive to generate the vast amount of steady, on-demand, uninterrupted electricity that we need for human thriving from fossil fuels than from wind and solar. Don't be deceived. While the estimated cost of new electric generating technology for onshore wind (\$86.60 per megawatt hour) is lower than for conventional coal (\$100.10) on a straight per-megawatt hour basis, there is a tremendous difference. Electricity generated from coal is dispatchable: ie, it is instantly available and not vulnerable to the intermittency of wind, sunlight, and river flow. Electricity generated from wind (and solar) is non-dispatchable, ie, it is

**Figure 22. Estimated levelized cost of new electricity generating technologies**



subject to intermittency and requires instantaneous backup by dispatchable technologies.

As IER explains: *“The more that no-dispatchable power is used, the more the electrical system requires investments in dispatchable generation forms to back up its increased use. Government policies that promote the use of non-dispatchable power are equivalent to requiring consumers to buy and care for two vehicles: one that works when you need it, and another that works when it feels like it. The hidden costs of non-dispatchable power are substantial and should not be overlooked as part of the public policy discussion.”*

The campaign to fight global warming by reducing fossil fuel use is at bottom a campaign to retain, especially in the world’s poor countries, the primitive energy system and its accompanying low incomes and high rates of disease and premature death. It is in fact a campaign of anti-humanism.

It follows that such a policy should be taken only if its benefits clearly exceed its costs, and that can only be true if the amount of warming caused by our CO<sub>2</sub> emissions is very high indeed—in fact, significantly higher than even the IPCC claims. As we saw earlier, however, climate sensitivity is probably significantly lower than the IPCC claims, leaving no justification for the campaign to decarbonize the world’s energy system.

The Second Great Commandment is, ‘Love your neighbour as yourself.’ In light of what I’ve presented here, I believe loving our neighbour implies rejecting the exaggerated claims of anthropogenic global warming, asserting the benefits of both the energy and the biological enhancement effects of fossil fuel use, and therefore rejecting calls to mitigate global warming by reducing CO<sub>2</sub> emissions.

What are a few things you can do in light of this information, to help protect the world’s poor from misguided climate and energy policies?

Let me invite you to:

1. come to [CornwallAlliance.org](http://CornwallAlliance.org)<sup>11</sup> and read the studies and articles there by the roughly 60 scholars in our network;
2. sign our petition *Forget ‘Climate Change’, Energy Empowers the Poor*<sup>12</sup>;
3. view our YouTube video series *Greener on the Other Side: Climate Alarmism—Facts, Not Fear*<sup>13</sup>, in which we interview over 30 world-class scholars in this field, and share them with friends through social media;
4. show our new documentary *Where the Grass Is Greener: Biblical Stewardship vs. Climate Alarmism*<sup>14</sup> to friends and at your church;
5. read and sign our *Open Letter on Climate Change*<sup>15</sup> and send copies of it to your elected representatives at local, state, and federal levels;
6. subscribe to our email newsletter to stay informed on new developments and how you can let elected officials know what you think on these issues;
7. follow and ‘Like’ us on Facebook<sup>16</sup>; and
8. visit [EarthRisingBlog.com](http://EarthRisingBlog.com)<sup>17</sup>, our blog specifically geared toward Millennials. ■

#### ABOUT THE AUTHOR

*E Calvin Beisner, Ph.D., is Founder and National Spokesman of The Cornwall Alliance for the Stewardship of Creation (2005–present), a network of ~60 Christian scholars—natural scientists, economists, and theologians—promoting Biblical earth stewardship and economic development for the poor. He was Associate Professor of Interdisciplinary Studies (concentrating on the application of Biblical worldview, theology, and ethics to economics, government, and public policy) at Covenant College (1992–2000) and of Historical Theology and Social Ethics at Knox Theological Seminary (2000–2008). He has written twelve books (including four on the population/economy/resources/environment nexus) and hundreds of articles.*

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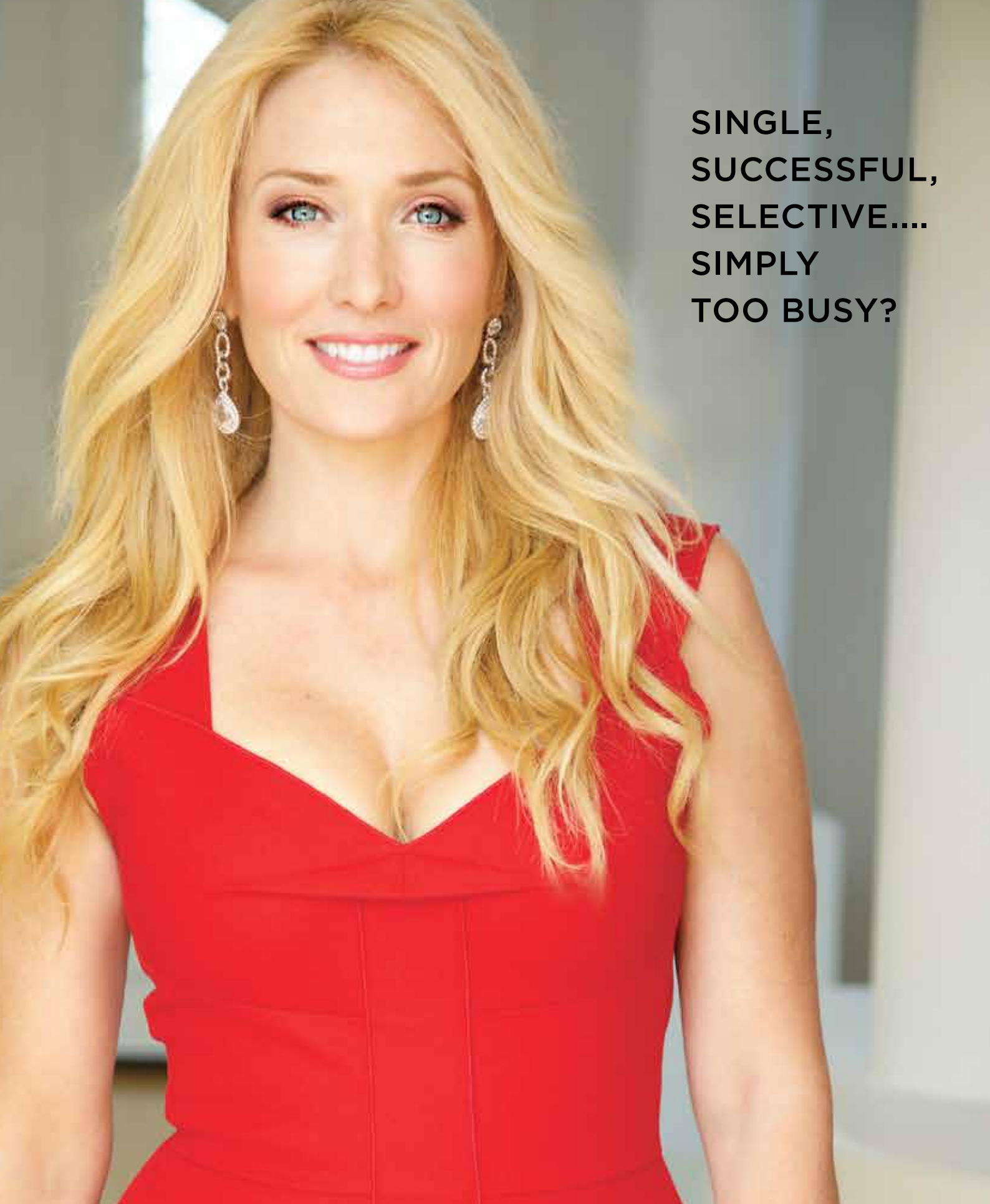
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