Editorial

A quarter of a century ago, as the Soviet empire dissolved, several researchers from the Centre for Economic Performance (CEP) gave policy advice to leaders of the formerly communist societies seeking to chart a new economic course. Peter Boone was particularly involved, working as an adviser to Russia’s finance ministry in the early 1990s and later as managing director of research at a Moscow based investment bank. In this CentrePiece, he looks back at the process of transition and explains how many of the successor states of the Soviet Union arrived at today’s combination of economic stagnation and political repression. With Russia’s economy once again in crisis, it is a timely reminder of the barriers to sustainable growth.

Continuing the post communist theme, Arnaud Chevalier and Olivier Marie examine the life outcomes of children born in East Germany after the fall of the Berlin Wall. This event provides what economists call a natural experiment: for comparing what happens to otherwise similar people in this case, those conceived just before and just after the Wall came down, as well as those born in East and West Germany around that time. The results indicate the potential long term damage of growing up in a period of high economic uncertainty.

*Mastering Metrics*, a new book co-authored by CEP’s Steve Pischke, lays out the essential tools for untangling cause and effect in human affairs, including the statistical methods for analysing natural experiments like the Berlin Wall. This issue contains two further examples: Reka Juhasz contrasts French regions whose fledgling cotton industries were differentially affected by Napoleon’s wartime blockade of British exports; and Michael McMahon compares how monetary policy makers at the US Federal Reserve (the Fed) behaved before and after they knew their statements would be placed in the public domain.

This study of whether central bank transparency enhances or inhibits constructive internal policy debate is also innovative in the data it uses, drawing on computational linguistics to explore what can be learned from large textual databases. And its key finding has already had a considerable impact on policy: the recent report by former Fed governor Kevin Warsh on transparency practices at the Bank of England describes it as the ‘important idea that motivates some of the Review’s ultimate recommendations’.

Much more about CEP research is on the website, including the latest in our series of quarterly updates on UK real wages plus some new films. As ever, your comments on any of these reports would be welcome.

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Business cycle blues
People do not psychologically benefit from economic expansions nearly as much as they suffer from recessions, according to Jan-Emmanuel De Neve and colleagues
A quarter of a century after the transition to a capitalist economy began, how are the nations of the former Soviet bloc faring? **Peter Boone** charts the failures of communism, the chaos that followed its collapse, the period of liberalisation and growth – and today’s unhealthy combination of economic stagnation and political repression.

**After communism:**
**25 years of revolution**

The decline of the Soviet empire caused a revolution far beyond the scale of any previous in history. More than 400 million people were affected as the 11 nations of the Soviet bloc quickly became 25 nations. Across most of these nations, banks and industry collapsed in economic depressions while inflation wiped out people’s savings and pensions.

By way of comparison, China’s communist revolution of 1949 affected 700 million people, but these were largely subsistence farmers in a nation where agriculture and finance was primitive. And the French revolution was comparatively tiny: only 28 million people lived in France in 1789, and most of them were farmers and labourers who were largely unaffected by the urban battles.

The failures of communism
After the Russian revolution of 1917, one of the Bolsheviks’ first steps was to raid the banks. Lenin expected to find them full of riches, but instead the cupboards were bare when the soldiers marched in (Mcmeekin, 2009). Over the succeeding decades, the Soviets confiscated all private property and built a system reliant on state ownership of nearly everything.

The failures of this system are well understood. Without the incentives inherent in private ownership, the Soviet bloc failed to keep pace with innovation and growth elsewhere in the world. After several decades of large-scale investment and ‘catching up’, the communist economies languished and fell behind their western competitors.

From the early 1970s, growth slowed and labour productivity lagged. Rising oil prices, and large discoveries of oil in western Siberia, provided a temporary economic boost, but with the post-1980 oil price crash, the respite was over and the Soviet empire faced renewed difficulties.

Yet when the Soviet empire did eventually fall, it caught most people by surprise. As with earthquakes and volcanoes, the timing of revolutionary change is far easier understood after the fact. But economic theory and experience does suggest some warning signs. For example, the Soviets began borrowing heavily in external markets to finance spending at home. And in 1986, President Gorbachev embarked on an anti-alcohol campaign, which caused a sharp drop in tax revenues.

By the late 1980s, the government was resorting to the errors made by many nations over history: it issued unbacked paper money to finance

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The decline of the Soviet empire has been remarkably peaceful and the economic outcomes generally successful
deficits, and that in turn caused the rouble to lose value and trust in money to dissolve. People began hoarding goods, trying to get rid of rouble cash before it lost value. Shops emptied of official goods at fixed prices, and the system of state controls was debased from within.

Government officials did attempt to raise prices and cut spending, but these measures were met with protests. The Communist Party quickly lost credibility and power. As Keynes once wrote, ‘There is no subtler, no surer means of overturning the existing basis of society than to debauch the currency’.

**Post-Soviet chaos**

As the Soviet empire dissolved, the disintegration of communist controls was rapid and complete. Looting and pillage is common during revolutions precisely because the existing systems of police authority and legal enforcement break down.

The assets up for grabs were enormous. Russia’s oil and gas industry alone is worth several trillion dollars. Azerbaijan, Kazakhstan, Turkmenistan and Uzbekistan all have rich mineral and energy assets. Every nation had developed banks and large-scale industry. The regional central banks, located in the capitals of each new nation as well as major districts, started printing money with little control from Moscow.

As the Communist Party dissolved and no alternative ‘supervisor’ came to take its place, an enormous ‘free for all’ was launched, permitting the most aggressive groups to grab these trillions of dollars in assets and cash flows. In the early 1990s, it was very common to read about private militia surrounding valuable enterprises or assets, so that they could physically take control.

This chaos did not come about by chance. The late Boris Fedorov, one of Russia’s leading economists and finance minister in the early 1990s, argued that chaos and lack of transparency served the purposes of many in power who were, whether inside or outside government, attempting to grab assets. It was far easier to rig privatisations or simply steal assets when the laws were unclear and enforcement was impossible (Boone and Fedorov, 1997).

Fedorov’s insight was often missed
abroad. Economists and journalists supposed that politicians had enough control that they could choose the pace and extent of reforms. Many suggested that Russia should turn back the clock, and slow down its pace of reforms to match China. But sitting in the capital city, no well-intentioned politician could manage the enormous anarchic forces that were tearing apart the old communist controls.

Most nations did manage to pass privatisation laws during these periods. The hope was that by specifying property rights clearly, the owners of the new assets could manage them more efficiently or sell them on to the highest bidders who could best manage them. Such laws did guide some asset transfers, but the underlying battle over resources was still brutal. The legacy of this opaque period still hangs over attitudes towards privatisation – and the ‘oligarchs’ who emerged – across the region.

The period of chaos ended within a decade. In most of Eastern Europe and the Baltic states, where nations hoped to join Europe, this experience was shorter or mostly avoided. In Russia, most of the assets had been grabbed by 1999, and there was growing awareness among the winners that they were better off with rule of law, and a system where they had incentives to build and invest their winnings, rather than attempt to grab more. President Putin came to power at this decisive moment.

Economic reform and growth
As Figure 1 illustrates, today the nations of the former Soviet empire have liberalised prices, privatised most of industry and created the essence of liberal market economies.

Some great companies have emerged from this battle. Metinvest (Ukraine), Severstal, Sibneft, TNK, Yukos and many others have emerged as world leaders in their areas. Ruthless corporate leadership focusing on efficiency and growth, partly explained by their emergence from that tough world of the 1990s, makes them appear far more capitalist than comparable firms in the West. There has also been rapid growth of private banks and small and medium-sized enterprises, filling in all the voids of services and consumer items that the communist system never satisfied.

The expectations for this new capitalist system have been borne out to a certain extent. Once the new pattern of asset ownership was staked out, participants turned to ‘growing their assets’ rather than fighting over ownership. This led to a productivity boom and a period of catch-up, so that most of the former Soviet bloc nations closed their productivity gaps with advanced nations.

As Figure 2 shows, over the last 20 years, productivity levels have generally risen rapidly, bringing national income levels from around 20% of advanced nations’ incomes in 1994, to near 60% of western levels by 2013. These rapid productivity gains, along with the birth of many impressively managed firms, have put an end to early concerns that ‘Homo Sovieticus’ might simply not respond to the incentives provided by a capitalist system. The broad failures of
the Soviet system that were the first impetus for its collapse have now been, largely and rapidly, resolved.

Stagnation and repression
But for many nations, we are surely not at the end of this revolution. The period of productivity booms appears to have prematurely ended after 2008. In its latest Transition Report, the European Bank for Reconstruction and Development uses recent growth trends, as well as fundamental factors, to draw the pessimistic conclusion that many of the nations of the former Soviet empire are on course to stagnate near current relative income levels (EBRD, 2013). The desire to catch up with the West, a precursor for the collapse of the Soviet system, appears, as in communist times, to be stymied. Why?

For nations seeking to join Europe, the answer is fairly simple. Ageing populations and low savings rates mean that there is too little investment to generate rapid growth. These nations will benefit from foreign investment, but it may take many decades to close the income gaps.

The real troubles lie in nations where there is no outside force, such as the European Union (EU), guiding them towards better institutions. In Russia, for example, growth has slowed sharply in recent years, and following substantial falls in the oil price and the value of the rouble, forecasts for 2015 suggest that GDP will decline, perhaps considerably.

Russia’s problems appear rooted in its ageing political regime. The team surrounding President Putin has evolved to give priority to members of the Soviet security apparatus. Their stated desire to build a strong state through renationalising and combining ‘national champions’ in the energy sector bears the hallmarks of pure power mongering.

Some of the best-managed private oil companies, such as Sibneft, TNK and Yukos, have been confiscated or repurchased by the state. Hopes that Gazprom, a large and poorly managed firm, would be broken up and privatised have been dashed. And the banking system has become, to some extent, a cash cow for officials’ benefit.

Similar problems of poor institutions plague resource-rich nations in central Asia. The new political model in Azerbaijan, Belarus, Kazakhstan, Russia, Turkmenistan and Uzbekistan is simple: leaders closely guard the commodity-rich enterprises for revenues, and they use the former communist security apparatus to suppress opposition.

Economic research suggests that nations with large commodity endowments tend to be less democratic, in part because leaders can avoid the broad consensus needed to raise revenues through wide-reaching taxes (Tornell and Lane, 1998). The power obtained through resource revenues, along with control of related companies and news media, are enough tools to keep the same elite in power for decades.

Less democratic nations tend to have weak rule of law and poor regulatory and investment climates. This may reflect the fact that under such a system, a narrow elite can manage policies and economic institutions to reap benefits for themselves at the expense of the nation as a whole. Such environments reduce incentives to build businesses and invest. Russia’s current outcomes appear to fit that prediction well, and much of Central Asia likewise.

Prospects for change in Belarus, Russia and Ukraine
Ukraine and Belarus stand out in a different manner. As Figure 2 illustrates, these nations have had the least success
in catching up. Here too the underlying problems appear political, although not driven by a large resource base. Ukraine’s pivotal position between Europe and Russia has endowed it with the power to win financing from these competing interests. Its government has swung regularly between ‘pro-Russian’ and ‘pro-EU’ stances. The Ukrainian elites have proved adept at auctioning their alliances for financial handouts. President Lukashenko in Belarus has built a strong police state, replacing communist controls with a self-described capitalist dictatorship.

But it is hard to imagine that these nations, where the revolutions are now failing to permit catch-up, will simply stagnate without more turbulence. The recent Maidan square protests and civil war in Ukraine’s east suggest how major regime change can occur. Opinion polls show an overwhelming majority of Ukrainians would like to join the EU, including a majority of the Russian-speaking minorities in the east. In essence, most Ukrainians are telling their leadership: ‘Our revolution is not over yet, we want to catch up with the West’. President Lukashenko should pay attention.

Change in Russia is more daunting. Large street protests, unheard of since the 1990s, have occurred in Moscow recently following unfair elections and policies towards Ukraine. Yet Putin’s inner circle seems highly unlikely to give up control without a violent fight. In most of the former Soviet Union, those losing power fear punishment from those who come next. The lack of safe exits for existing leaderships remains a major stumbling block for regime change without violence.

A surprisingly peaceful transition

Perhaps the most puzzling aspect of these 25 years of revolution is precisely this lack of violence. Despite the enormous wealth transfers and a large power vacuum at all levels of society, there have been few deaths and no violent military-led coups or expansive civil wars (with the exception of former Yugoslavia).

Perhaps the reason for this is that there were easier non-violent means for the ‘aggressors’ to get what they wanted. Lenin was faced with a strong military opposition to his revolution, so he was forced to fight a civil war. But when the Soviet empire collapsed, the vast majority of the population was pleased to see the Communist Party defeated.

Across these nations, the security apparatus and military fragmented, as the more aggressive individuals within them struck out to stake out claims on assets. In that environment, there were no concentrated foes that could start battles. Today that has changed: the former security apparatus has consolidated again, and once more become an important tool of maintaining power for a narrow elite.

But history tells us that revolutions are often followed by major or minor counter-revolutions before lives become normalised. The French revolution was largely a fiasco for early French democracy and European peace: after 10 violent years, a military dictatorship under Napoleon took power. The Chinese revolution was followed by a large-scale famine and the renewed disaster of the cultural revolution of the 1960s.

Compared with these events, the decline of the Soviet empire has been remarkably peaceful and the economic outcomes have been generally successful. But we are now embarking on a new phase, where entrenched regimes are again suppressing democracy and their policies are hindering economic catch-up. These regimes may be more prepared to fight to maintain power than were the former communists.

When Zhou Enlai, the former Chinese premier, was asked for his views on the impact of the French revolution, he is said to have responded ‘it is too early to say’ (though he may have thought the question was referring to the 1968 student demonstrations rather than 1789). The final outcomes in the aftermath of the fall of the Berlin Wall are similarly ‘too early to say’.

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He served as a resident technical adviser to the finance ministry in Poland in 1990-91 and the Central Bank of Mongolia during 1991. Between 1991 and 1993, he worked in Russia as an adviser to the plenipotentiary for negotiations with the IMF and the World Bank, as well as an adviser to the Russian finance ministry.

And from 1997 to 2003, he was managing director of research at Brunswick UBS, a Moscow-based investment bank.

Further reading


The most puzzling aspect of 25 years of post-communist revolution is the relative lack of violence.
Do people born at different points of the economic cycle have different outcomes – and if so, why? Arnaud Chevalier and Olivier Marie examine the educational attainment and criminal activity of children born in East Germany in the few years after the fall of the Berlin Wall – a time when uncertainty about the future was extremely high.

Long shadow of the Berlin Wall

The end of communism in Eastern Europe had colossal repercussions for the economic development of the region, but also, and perhaps less obviously, for its demography. Fertility went into a sharp decline (United Nations Economic Commission for Europe, 2000), especially in East Germany where there was a 50% drop in fertility over a very short period (see Figure 1). This outcome has been described by demographers as the ‘most substantial fall in birth rates that ever occurred in peacetime’ (Conrad et al, 1996).

Economic uncertainty was one of the main reasons for the fertility drop. Which kind of parents still decide to have children in such distressing economic times – and does this parental selection matter in terms of the outcomes for the cohort?
According to economic theory, a downturn can have two opposite effects on the demand for children: it reduces household income (an ‘income effect’) but it also reduces the opportunity costs of having children (a ‘substitution effect’). Which effect dominates is a priori ambiguous but since fertility typically rises and falls with the economic cycle of booms and recessions, the income effect seems to dominate overall.

But it is also likely that the relative size of the substitution and income effects depends on family characteristics, which in turn will lead to differences in the composition of cohorts of parents over the economic cycle. For example, US research shows that white mothers who give birth in more difficult economic times when unemployment is higher are less educated, which results in worse health outcomes for their children at birth (Deheja and Lleras-Muney, 2004).

The fall of the Berlin Wall provides a unique ‘natural experiment’ to study the question of parental selection based on national economic circumstances. In our study, we define the cohort of children born in East Germany between August 1990 (conceived just after the Wall came down) and December 1993 as the ‘Children of the Wall’. We provide evidence on parental selection based on three measures: first, the average criminal activity of the Children of the Wall as they grew up; second, their educational attainment; and third, detailed self-reported individual

Figure 1:
Annual crude birth rate per 1,000 women between 1950 and 2008

Notes: Calculations based on administrative population data from the Federal Institute for Population Research (http://www.bib-demografie.de).

Children of the Wall had worse educational outcomes and were more likely to have been arrested
information on their parents’ skills.

Using state-level statistics on contact with the police by age group over the period 1993-2011, we find that the Children of the Wall had arrest rates at least 40% higher than older cohorts in East Germany as well as their West German peers. This is true for all crime types and for both boys and girls. Importantly, these differences in the frequency of contact with the police started to appear as early as age 6. This is despite the children being part of a numerically smaller cohort, which is usually associated with positive outcomes. It is indicative of strongly negative parental selection.

Similarly, the Children of the Wall had worse educational outcomes. Compared with their class peers who were conceived just before the Wall came down, they had lower test scores at ages 11-12 and ages 15-16, and they were over-represented among low achievers. As such, they were 33% more likely to have repeated a school grade by age 12 and 9% more likely to have been put onto a lower educational track.

To explore if these negative outcomes were driven by negative parental characteristics, we use very detailed survey data from the German Socio Economic Panel (SOEP) and the Deutsches Jungedinstitut surveys.

Our analysis shows that women who gave birth in East Germany just after the end of the communist regime were on average younger, less educated, less likely to be in a relationship and less economically active. Importantly, according to the survey, these parents also provided less

Figure 2: Economic uncertainty and fertility decisions in early 1990s Germany: the probability of having a child by economic worry and education level

Notes: The graph plots the estimated probability of having a child in the period 1991/93 separately for individuals reported to be very worried about the economy (‘very’ = 1 and ‘somewhat’/‘never’ = 0) or not, by years of education for all women aged 17 to 47 surveyed in SOEP during this period.
educational input to their children even if they were not poorer. The Children of the Wall also rated their relationships with their mothers and the quality of parental support they received by age 17 much less favourably than their peers. Both these children and their mothers were likely to take greater risks compared with individuals who did not give birth (or were not born) in East Germany between August 1990 and December 1993.

While these results are in line with negative parental selection, they could also be driven by the timing of birth effects. For example, because of the economic turmoil at their time of birth, these children may have experienced higher levels of maternal stress in utero and during early childhood, which may have shaped their future behaviour.

To assess this hypothesis, we examine the same set of outcomes for the older siblings of the Children of the Wall, who were born in the relatively stable times of East German communism. They too reported having a poor relationship with their mothers, they too had lower educational attainment and they too were more risk-taking individuals. We thus reject the possibility that the Children of the Wall had worse outcomes because they were born in ‘bad times’. Instead, we conclude that the negative outcomes for this cohort can be explained by the lower average parenting skills of those who decided to have children during a period of high economic uncertainty.

A possible reason for this negative parental selection is that the fertility decisions of certain women did not react as strongly to changes in the economic environment. Indeed, further analysis of the SOEP reveals that less educated mothers were far less likely than more educated ones to reduce their fertility when they perceived a bad economic environment (see Figure 2).

Our findings confirm that parental selection may be one of the best predictors of the future outcomes of a cohort – and that this is most likely to operate through the quality of parenting.

These conclusions have potentially important policy implications. First, the provision of public services should not only be based on the size of an incoming cohort: more attention should be paid to its composition. Second, interventions need to start from a very young age and targeting could probably be improved by including non-cognitive characteristics, such as the attitudes to risk of expectant mothers and their children.

This article summarises ‘Economic Uncertainty, Parental Selection, and the Criminal Activity of the “Children of the Wall”’ by Arnaud Chevalier and Olivier Marie, CEP Discussion Paper No. 1256 (http://cep.lse.ac.uk/pubs/download/dp1256.pdf).

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Further reading


Parental selection may be one of the best predictors of the future outcomes of a cohort
If successfully concluded, the Transatlantic Trade and Investment Partnership (TTIP) would be the most ambitious free trade agreement in history. **Dennis Novy** explains that while the potential benefits from liberalised transatlantic trade are large, getting there will be an arduous process and many difficulties will have to be overcome.

**TTIP: is free trade coming to the North Atlantic?**
TTIP has the potential to benefit millions of consumers

A plan to create a free trade area between the European Union (EU) and the United States – the Transatlantic Trade and Investment Partnership (TTIP) – was officially launched at the G8 summit in Northern Ireland in June 2013. I was the specialist adviser on a recent parliamentary investigation of the potential impact of TTIP and the likelihood that it will get off the ground (House of Lords, 2014).

Winners and losers
Partly because of the sheer scale of TTIP – the EU and the United States together represent about 45% of global output – and partly because it will attempt to tackle non-tariff barriers and regulation, the proposed mega-deal is potentially a ‘game changer’ for twenty-first century trade (Hoekman, 2014). But what would be its likely effects on Europe in general and the UK in particular?

A study by the Centre for Economic Policy Research (CEPR, 2013) indicates that in the best-case TTIP scenario, the average EU household of four could see its disposable income rise by €545 per year by 2027 as a result of lower prices and higher productivity. But the degree of uncertainty involved in such predictions is immense, not least because they depend on the extent of the agreement: will there be a comprehensive agreement with full liberalisation of non-tariff barriers or a ‘light’ agreement with not much more than a cut in tariffs?

We probably have a better sense of the cross-industry gains and losses. It is likely that the car industry stands to gain considerably from TTIP on both sides of the Atlantic. Not surprisingly, it is one of the best organised industries in relation to TTIP. For the UK, other industries likely to gain include chemicals and pharmaceuticals.

But even if we believe that TTIP would be beneficial for countries and consumers as a whole, there will inevitably be losers. For example, highly protected parts of the Mediterranean agricultural industry might shrink once their tariff and non-tariff barriers are removed. It is unclear how governments envisage mitigating the adverse effects.

Losing the public debate
In any case, cold numbers will not win the hearts and minds of the electorate. The potential benefits of TTIP are likely to be diffuse while the costs will be concentrated. The lack of transparency surrounding the negotiations creates further suspicion.

Governments have to come up with much more convincing narratives and concrete examples if they want to sway the public debate on TTIP. How would the average person benefit from this trade agreement? Why is it in the UK’s long-term interest to engage in such negotiations?

TTIP might be the last opportunity for individual European countries to set high-standard global trade rules

At the moment, in most EU countries, the debate centres on specific items such as whether Europeans will allow chicken to be washed with chlorinated solution (as practiced in the United States), or whether international arbitration panels as opposed to local courts will be allowed to resolve disputes. These issues are important and deserve a proper public discussion. But in many cases, cherry-picked items have been hijacked by campaigners with a certain political agenda. The public debate would benefit from a more diverse and balanced discussion that takes account of arguments both for and against TTIP.

Governments across the EU are broadly in favour of TTIP, but it seems that they are currently losing the public debate. Communication cannot be left to the European Commission alone. Governments should engage more with their national electorates, and this engagement needs to happen at all levels of government, not only through trade and economics ministers.

Important sticking points
A number of difficult issues stand out, including:

Regulation and non-tariff barriers
The core of TTIP negotiations is not about tariffs but rather about aligning regulation and removing non-tariff barriers (Donceel, 2013). A classic example is car safety regulation. There is
TTIP is not only an economic project but also a political project to promote transatlantic ties

no evidence that cars are less safe in either the EU or the United States. But car manufacturers currently have to comply with two different sets of regulation. Removing duplicate regulation would bring down production costs and arguably consumer prices, even if this does not automatically generate new trade. While car safety is a common sense issue, negotiators face many controversial issues, such as food safety regulation where many Europeans perceive standards to be lower on the other side of the Atlantic.

Agriculture
Agriculture is traditionally a contentious area. For example, not all geographical indications such as Parma ham and champagne will be recognised by the United States. Meat exports are another difficult issue.

Government procurement
Fair and open access to government contracts is supposed to be an essential part of TTIP. But access is especially difficult to obtain at the sub-federal level where the national government might have less power to legislate. Some promising progress has been made by the EU on that front in its recent free trade agreement with Canada.

Investor-State Dispute Settlement (ISDS)
ISDS is an enforcement mechanism that is supposed to avoid discrimination against foreign companies. It is a particularly contentious issue in Europe, where a hostile stance has been adopted by the German government, large parts of the German public and increasingly also in the UK. Perhaps not surprisingly, ISDS is also an issue where a great deal of misinformation is inserted into the public debate by anti-globalisation campaigners.

Given these countries’ resistance to ISDS, there has been considerable pressure on the EU to drop ISDS from the negotiations. But given that the EU typically insists on ISDS mechanisms when negotiating trade agreements with lower-income countries, it would smack of hypocrisy to oppose them when negotiating with the United States.

Financial services
Financial services are a priority for the UK given their weight in the national economy. But the United States strongly resists the inclusion of financial services in TTIP, partly because it is occupied with implementing the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010, which seeks to increase the safety of the financial system in the wake of the Great Recession of 2008/09.

Geostrategic considerations
International trade in the modern world is increasingly about ‘making things’ and no longer as much about ‘selling things’ (Baldwin, 2012). The rise of outsourcing and global value chains has fundamentally transformed international trade and foreign direct investment. Governance is needed to regulate these trends.

Given the enormous size and clout of the EU and the United States, TTIP might be a forum where twenty-first century trade rules are set. TTIP is supposed to be a ‘living agreement’ that creates a permanent dialogue for the future where new regulation is discussed and implemented. In that sense, TTIP is not only an economic project but also a political project to promote transatlantic ties.

Given the rise of emerging economies, TTIP might be the last opportunity for individual EU members such as the UK to have a major impact on setting high-standard global trade rules. The price of failure might therefore be high.
Parallel developments and the role of China
In addition to TTIP, the United States is currently negotiating the Trans-Pacific Partnership (TPP) with 11 other countries (Australia, Brunei, Canada, Chile, Japan, Malaysia, Mexico, New Zealand, Peru, Singapore and Vietnam). TPP is seen as more difficult politically since it involves low-wage countries such as Vietnam. Issues of labour and environmental standards are likely to come up, but these play less of a role in the TTIP negotiations.

It has been suggested that TTIP and especially TPP are designed to contain China – or at least to encourage China to engage more actively in global trade initiatives. TTIP should not be a closed shop. Third countries should be allowed to participate and appropriate arrangements need to be discussed (Winters, 2014).

Political uncertainty
TTIP involves an enormous political agenda and would be difficult to handle even in the best of circumstances. Additional complications arise from the changing political landscape on both sides of the Atlantic. In the EU, the new European Parliament is likely to be less friendly towards international trade and investment (Erixon, 2014).

On the US side, the mid-term elections in November 2014 took momentum away from the TTIP agenda. The US administration is yet to secure ‘trade promotion authority’ from Congress, without which the US administration cannot make serious negotiating offers. If no major progress is made in the narrow window of opportunity before the presidential election cycle kicks in, then we might not see a successful conclusion of TTIP until 2017 or even 2020.

How can research contribute?
Evidence on the effects of trade agreements is hard to produce. Nevertheless, there is strong demand for high-quality research. For example, it is frequently claimed that trade liberalisation leads to lower consumer prices. While it is easy to produce theoretical models with this result, it is harder to show this convincingly in the data. Prices can move for dozens of reasons, and international trade is only one potential factor.

Furthermore, there is not enough research focus on non-tariff barriers such as differential regulation. These barriers are typically much harder to measure than tariffs, but businesses clearly perceive them as the biggest impediment to free trade.

Finally, some aspects of political economy have received relatively little attention in trade research. For example, there is sometimes a mismatch between negotiators. Many US representatives tend to be ‘technocrats’, often lawyers, who have in-depth expertise on specific issues such as regulation. In contrast, their EU counterparts might be political appointees who delegate specific issues to expert aides. As a result of this imbalance, it can be hard to make substantive progress.

Conclusion
TTIP has the potential to benefit millions of consumers. It goes far beyond an economic project. Its current timetable seems ambitious. Without considerable attention and support from the highest levels of government, it will be hard to lead TTIP to a successful conclusion any time soon.

Dennis Novy is an associate professor at the University of Warwick and a research associate in CEP’s globalisation programme. He was the specialist adviser to the House of Lords on TTIP and his views expressed here do not necessarily reflect those of the House of Lords.

Further reading


TTIP might falter if there is not enough political support from the top echelons of government
Can temporary protection from trade with advanced economies foster the development of ‘infant industries’ in developing countries? **Reka Juhasz** considers a natural experiment: Napoleon’s wartime blockade of British exports, which allowed protected regions to build capacity in the new technology of mechanised cotton spinning and later to compete successfully in international markets.

**Napoleonic protectionism:**
how France’s cotton industry gained

Legend has it that in the late 1960s, Park Chung-hee, South Korea’s military dictator, exhorted the car manufacturer Hyundai to start building ships, as there was a sudden increase in global demand for oil tankers. Not only did the country have no experience in shipbuilding, it didn’t even have a shipyard. The domestic market at that time was heavily protected from foreign competition, with firms like Hyundai highly subsidised and encouraged to export.

Building the ships and the shipyard went hand in hand. Lack of experience meant that entire parts of the ship had to be dismantled and reassembled when things went wrong. Despite these setbacks, two years later, the initial orders were delivered on time – and today South Korea is home to the three largest shipbuilders in the world.

For centuries, economists have argued over whether nascent industries, such as shipbuilding in South Korea, can benefit from temporary trade protection. The idea, known as the ‘infant industry argument’, goes back at least to Alexander Hamilton, a founding father of the United States and an ardent proponent of protecting US manufacturing from Britain’s industrial might.

Over the years, governments attempting to kick-start industrialisation have experimented with various forms of infant industry protection. Germany and the United States, two industrial powerhouses of the late nineteenth century, industrialised behind highly protective tariffs. China and the East Asian growth miracle are more recent examples.

But we must add to this list all the cases in which seemingly similar infant industry protection failed spectacularly. In the 1980s, countries across South America were left with globally uncompetitive but politically well-connected industries after decades of ‘import substitution’, a particular form of infant industry protection. And countries in Africa are littered with ‘white elephants’ – grand infrastructure projects that never delivered on the promised gains.

Despite centuries of policy ‘experimentation’, the debate on whether infant industry protection works seems no closer to being resolved. This is partly because measuring the effect of protection on the development of an infant industry is tricky:

- First, the idea that an industry needs to be protected from competition before it can become competitive relies on the existence of market imperfections that prevent entrepreneurs from entering the industry at free trade prices. These are difficult to observe and even harder to measure.
- Second, protection is generally granted by government at the request...
of the industry. This makes it hard to determine whether the industry became competitive because of protection or whether it would have become competitive anyway.

Third, even though the industry might become competitive over time, this would not necessarily benefit the economy overall. Protection – whether it is a subsidy or a tariff – comes at a price, and determining whether the growth benefits outweigh the short-run costs of implementing the policy is not trivial.

My research uses a historical episode from the nineteenth century to shed light on the question of whether infant industry protection can work. I show how mechanised cotton spinning developed and subsequently became competitive in parts of the French Empire as a result of temporary changes in the extent to which different regions were exposed to British trade.

The appealing aspect of this setting is that regional differences in temporary infant industry protection – shaped by events determined outside the country’s borders – make it possible to compare regions in the same country that became better protected from trade with regions that remained more exposed to trade. Trade protection of various regions was shaped by the effect of Napoleon’s wartime blockade of trade between Britain and France.

During times of war, countries often blockade one another’s ports to impose economic hardship. Napoleon lacked the naval power to implement such a blockade of British ports, so instead he used his influence over much of Europe to attempt to stop British goods from entering continental ports. Ports were closed to British goods and the French military was active in enforcing the blockade along the European coastline.

From the outset, it was clear that the undertaking was huge: successful implementation of the blockade implied that all countries would adhere to the blockade simultaneously. In reality, trade between Britain and the continent did not come to a standstill as Napoleon wanted, but rather goods were smuggled into France via ports outside the French Empire that remained open to trade with the British.
Importantly for my analysis, while the blockade was generally effective along the coastline of the French Empire, it was unevenly successful outside the country’s borders. In particular, while implementation of the blockade was for the most part effective across parts of northern Europe, it was far less successful in southern Europe, where the British were militarily stronger (see Figure 1).

The inherent asymmetry in military power was further undone by the Spanish insurgency against Napoleonic rule. This event proved catastrophic for the blockade, as from the onset of the insurgency, the entire Iberian peninsula became open to British trade and provided a direct overland link to France.

Geographical variation in the effectiveness of the blockade outside the French Empire meant that trade between Britain and France became temporarily more expensive for some French regions than others. Regions within France witnessed smaller or larger increases in their costs of trading with Britain depending on the extent to which trade was displaced from direct to more indirect, and hence more expensive, trade routes. These routes entered the French Empire overland via ports that remained open to trade with the British.

My analysis focuses on the development of mechanised cotton spinning, as this was a new technology that French spinners had not adopted on a wide scale prior to the Napoleonic wars. Consistent with this technology lag, firms in France were producing cotton yarn at twice the British price.

Napoleonic protectionism was less a result of economic policy than of geopolitical events.
Following the invention of the spinning jenny in Britain in the late eighteenth century, cotton became a hugely important industry. The new technology led to enormous productivity increases in the production of yarn, and it was key to Britain's dominance of the industry. Cotton also played an important role later in Belgian, French, German and US industrialisation. The unskilled labour-intensive textiles sector was generally the first to draw workers away from agriculture and into full-time factory work – and it was thus an important step in the development process.

Nineteenth century cotton manufacturing also had strong ‘learning spillovers’ of the kind that are important to infant industry arguments. In Britain, the early machines were crude devices and workers were instrumental in improving them. What worked in one firm was soon copied by others. A lot of the technology required in spinning was new, and for this reason, the cotton mills were built by a handful of men who had acquired their skills on the job. Each new factory was a little bit better because of the experience acquired from building the previous one.

Entrepreneurs and the government in France sent industrial spies to Britain to copy the new machines, which could not be exported because of a government ban. Despite artificial barriers on technology diffusion, many of the first cotton mills were set up by British engineers and entrepreneurs who brought workers across the Channel to show French spinners best-practice techniques. Yet on the eve of the French Revolution in 1789, there were only 900 spinning jennies in France, while Britain boasted 18,000.

During the 10-year period of the blockade, cotton production capacity in the new technology quadrupled in France. But development was regionally uneven (see Figure 2). Consistent with increased protection in northern regions of the French Empire, spinning capacity in those regions increased enormously, while firms in areas around the Spanish border went bankrupt.

Larger increases in spinning capacity were systematically related to areas that received increased protection from British trade as a result of Napoleon's blockade – and the effect of increased protection was large. To rule out alternative explanations driving the results, I show that the rupture in trade with Britain did not have the same effect on woollen spinning and leather tanning, two closely related industries that were less intensively traded with Britain and which did not experience the same degree of technological change.

In examining the infant industry argument at work, we don't just want to know how cotton spinning in the French Empire fared during the blockade: we also want to assess whether the industry became competitive after peace and traditional trading routes were restored. Examining the location of cotton spinning within France in 1840 confirms that the blockade had long-lasting effects at the regional level. Those places that increased capacity in the new technology during the blockade remained important centres of cotton spinning 25 years later.

Firms located in these regions were also more productive in the long term. French exports of cotton goods increased after the end of the Napoleonic wars, and they increased relative to British cotton exports, showing that the industry was able to compete successfully in international markets (see Figure 3).

Was France bound to become competitive in cotton by this time? The evidence suggests that this is unlikely. As late as 1850, more than three decades after the end of Napoleon's rule, Belgium and France, two areas of the empire that enjoyed high levels of protection from British trade, had larger cotton industries than other European countries. Most strikingly, the domestic cotton industry was generally small in countries that had been exposed to higher levels of British competition throughout the blockade.

This episode provides evidence of the fact that a mechanism similar to the one emphasised by advocates of infant industry protection for centuries may be at work in certain settings. In many ways, industrialisation in France, in which the...
mechanisation of cotton spinning played an important role, is also representative of the development path that many countries have followed as large parts of their workforces move out of agriculture and into manufacturing. This suggests that similar forces could be at work in countries hoping to industrialise in the twenty-first century.

But a number of important qualifications are needed before translating the findings from this episode into policy prescriptions. Initial income differences between nineteenth century Britain and France were small in comparison with differences between rich and poor countries today. On the one hand, this suggests that mechanisms that inhibit countries from moving into certain sectors may be even more significant in modern settings.

On the other hand, small initial differences also meant that the conditions necessary for fostering modern industrial production were already in place prior to the Napoleonic wars. One reason why infant industry protection in practice may often fail is that policy-makers try to foster industries for which their country does not have the necessary underlying conditions.

A further difficulty in translating the findings in this setting to direct policy advice is that measuring the effect of protection from British competition on mechanisation in France was made possible by the fact that protection was not a result of economic policy. In practice however, infant industry protection is almost always the result of political intervention in the economy. Another important reason for so many failed infant industry projects may be the fact that the political process is captured by special interests. As such, resources may be allocated not towards sectors in which the country has high growth potential, but rather, towards sectors in which the economy cannot and will not be able to compete in the future.


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France’s industrialisation is representative of the development path that many countries follow
If central banks publish the transcripts of their internal policy debates, will discussions be enhanced or inhibited? Michael McMahon and colleagues use tools from computational linguistics to analyse the positive and negative effects of transparency on deliberations of the monetary policy-makers at the US Federal Reserve.

**The dilemma of central bank transparency**

The world’s major central banks display significant differences in transparency. The European Central Bank (ECB) currently publishes no direct information on its internal policy debates, and will only release minutes with a 30-year lag. The Bank of England releases minutes soon after meetings, but withholds transcripts. The US Federal Reserve (‘the Fed’) releases both minutes and transcripts of the Federal Open Market Committee (FOMC) meetings after a five-year lag.

Some of these policies have recently been revised. In December 2014, the ECB confirmed its commitment to publish regular accounts of the Governing Council’s monetary policy meetings from January 2015 (ECB, 2014). Earlier that month, the Bank of England published an independent report on its transparency practices and procedures by former Fed governor Kevin Warsh (2014), and announced that it...
would publish minutes simultaneously with policy decisions from August 2015 and meeting transcripts with an eight-year lag.

So what is the right level of transparency? Some transparency is clearly required for democratic accountability, but what are the costs and benefits of increasing the public’s information about the policy-making process?

Theory suggests that the primary channel through which transparency matters for policy-makers’ behaviour is ‘career concerns’ – the idea that experts wish to protect their reputation for competence. The main positive effect of transparency due to career concerns is that increased visibility provides additional incentives for committee members to work hard to identify appropriate policies (Holmström, 1999).

The main negative effect (predicted by Prat, 2005) is that policy-makers become conformist and begin parroting the views of their colleagues to avoid standing out, which leads to a stifled and uninformative debate. When speculating on the effect of releasing Fed transcripts in 1993, Alan Greenspan, then FOMC Chairman, expressed exactly this concern: ‘I fear in such a situation the public record would be a sterile set of bland pronouncements scarcely capturing the necessary debates which are required of monetary policy-making’ (Greenspan, 1993).

In our research, we use FOMC transcript data to test for the presence of these two effects – the ‘discipline effect’ and the ‘conformity effect’ – and examine which one dominates. The first challenge, familiar to applied economists, is to disentangle causal relationships. The second, much less typical, is to quantify text data and use it to study patterns of communication.

Identifying the effect of transparency on deliberation

Since the mid-1970s, FOMC meetings have been tape-recorded to assist preparation of the minutes, but until late 1993, committee members believed that these tapes were recorded over and their content destroyed. Then, in response to political pressure from the Senate Banking Committee, Fed staff informed the FOMC that verbatim transcripts prepared from the tapes indeed existed. Having previously denied their existence, Chairman Greenspan and the FOMC felt compelled to agree to release all past transcripts, in addition to all future transcripts, with a five-year lag.

This creates a ‘natural experiment’ for us to analyse: prior to late 1993, FOMC members deliberated under the assumption that their debate was private, whereas afterwards they knew every spoken word would eventually be publicly observable. Importantly, this change arose not from the Fed itself in response to committee design concerns, but from external events.

Rather than examine changes before and after increased transparency, we adopt a ‘difference-in-differences’ approach to identify the precise effect of career concerns. In other words, we test whether any changes in deliberation in response to increased transparency are greater for committee members with more career concerns.

Theory predicts that the impact of career concerns declines with experience: as observers gather more information about policy-makers, the less their behaviour affects their reputation. So as a proxy for the strength of members’ career concerns, we use the number of years they have worked at the Fed. Within this framework, we attribute changes in deliberation after transparency that are relatively greater for members with less experience as being driven by career concerns.

Measuring communication

The challenge remains of how to measure deliberation and how it might have changed. For this, we draw on tools from computational linguistics and machine learning. These underlie much of the search engine and pattern recognition software used by billions of people every day. We also believe they have a bright future in the social sciences for extracting relevant metrics from large textual databases. Given the newness of these methods, it is worth taking a moment to describe how we extracted the data.

The simplest measures we use are counts of various aspects of members’ deliberation, such as how many times they speak in a given meeting or how many questions they ask. But most of the analysis draws on the Latent Dirichlet Allocation (LDA) model (Blei et al., 2003). LDA is a statistical method for discovering ‘topics’ within members’ statements, where a topic is a probability distribution over words. The content of each statement is then a probability distribution over topics.

Less experienced monetary policy-makers refer more to data and staff briefings when their remarks will be made public

LDA is an unsupervised machine-learning algorithm, which means it uses no pre-assigned labels to identify topics. Researchers like us can provide documents (in our case, every statement in every meeting of Greenspan’s Chairmanship) along with a given number of topics to extract (we use a baseline of 50), and LDA returns estimates of the topics and the allocation of topics within each statement.

LDA is essentially a very flexible clustering algorithm, with the important feature that the same word can appear in multiple topics with different probabilities. Prior to estimation, we process the text by dropping extremely common and infrequent words, and ‘stemming’ words to bring them into a common linguistic root. ‘Preference’ and ‘prefer’, for example, both become ‘prefer’ after stemming.

The estimated topics correspond closely to ones that economists would naturally imagine arise at monetary policy meetings. Figures 1 and 2 show two examples, using word clouds in which the size of a word indicates the relative likelihood of its appearing in the topic.

We label the topic represented in Figure 1 the ‘inflation topic’ since its most likely words are clearly about inflation. ‘Infla’, the stem of various words related to inflation, is the most likely word, but words like ‘CPI’ and ‘core’ also occur with high probability. The topic in Figure 2 is one that captures words related to ‘Consumption and Investment’ demand, such as investment, inventories, income and consumption.

LDA yields member-meeting specific shares of time spent on each topic. From these, we can measure the amount members refer to staff briefing material and quantitative data, their topic breadth and the similarity of members’ topic coverage.
Our findings
So what does our analysis reveal? We find evidence of both the discipline and conformity effects. After transparency, more inexperienced FOMC members discuss a broader range of topics and use significantly more references to quantitative data and staff briefing material during the discussion on the economy. This indicates that they prepare more for meetings and gather additional information.

On the other hand, in the policy debate that follows the economics discussion, inexperienced members make fewer statements, ask fewer questions and speak more like Chairman Greenspan, all of which points towards conformity.

To gauge the overall effect of transparency on the informativeness of inexperienced members’ statements, we construct an ‘influence score’, which measures the extent to which a member’s speaking more about a given topic leads colleagues to speak more about it in the future. After transparency, inexperienced members become significantly more influential, suggesting they bring relatively more information to the discussion.

Overall, transparency appears to have been beneficial at the Fed by increasing information in spite of creating a more sterile debate. The challenge for central banks considering increasing transparency is to structure the deliberation process to maximise the discipline effect while minimising the conformity effect. Quoting our conclusion, the recent Bank of England report on transparency said ‘it is this important idea that motivates some of the Review’s ultimate recommendations’ (Warsh, 2014).

Further reading


in brief...

Business cycle blues

People do not psychologically benefit from economic expansions nearly as much as they suffer from recessions, according to research by Jan-Emmanuel De Neve and colleagues.

How do macroeconomic changes affect people’s wellbeing? It would be reasonable to expect the massive swings of recent decades – see-sawing from boom to bust and back again – to be reflected in a parallel see-sawing of their psychological impact.

But our research reveals an important asymmetry in the way that individuals experience positive and negative fluctuations of the business cycle. We find evidence that the life satisfaction of individuals is between two and eight times more sensitive to periods when the economy is shrinking than at times of economic growth. People do not psychologically benefit from expansions nearly as much as they suffer from recessions.

Our results suggest that policy-makers seeking to maximise wellbeing should focus more on preventing busts than promoting booms. They also help to explain why rising GDP does not always pay off in increases in happiness: the modest happiness gains accrued over years of growth can be wiped out by just a single year of contraction.

To explore how individuals react to positive and negative growth, we analyse wellbeing measures from three large datasets: the Gallup World Poll of 151 countries; a representative sample of 2.5 million Americans; and Eurobarometer, a twice-yearly opinion survey conducted by the European Commission.

In general, we find that growth is significantly associated with wellbeing. But when split across positive and negative growth, this result is mostly driven by the negative growth years. Recession years are significantly associated with losses in wellbeing, but there is not an immediate relationship between positive growth years and wellbeing.

So why do people experience macroeconomic losses more negatively than they experience equivalent gains positively? People’s disproportionate sensitivity to negative stimuli – and the general finding that ‘bad is stronger than good’ – may have an explanation rooted in evolutionary biology, since in terms of survival the avoidance of threats is more important than a missed opportunity.

Periods of economic contraction not only involve a loss of national income but also an increase in uncertainty, which is arguably intensified by the disproportionate coverage of negative news about macroeconomic trends compared with positive trends. Volatile business cycles and the

Recessions can rapidly undo the wellbeing gains from longer expansionary periods
resulting uncertainty are also attention-seeking stimuli. Other research has highlighted the role of economic insecurity in increasing angst and stress by showing that the subjective wellbeing of employed individuals working in the public sector – who in general enjoy more job security – is less acutely affected by economic shocks than comparable, less protected workers in the private sector.

The central findings of our study provide an opportunity to revisit the longstanding debate on the relationship between economic growth and wellbeing. When considering longer-term data, which cover entire business cycles, it appears that reported wellbeing has not risen in most of the world’s economically developed countries despite real GDP having almost doubled over the past four decades.

This result echoes work by Richard Easterlin, the pioneer of research on happiness economics. Easterlin’s ‘paradox’ – resulting from conflicting findings in the short term (using annual growth data, which incorporate both positive and negative growth years) versus the long term (real GDP data that cover one or more business cycles) – can perhaps be better understood in light of CEP’s results on macroeconomic ‘loss aversion’. Recessions can rapidly undo the wellbeing gains from longer expansionary periods and lead to an insignificant relationship between national income and average wellbeing when considered in the long run.

The experience of Greece is illustrative. The country’s real GDP grew by more than 50% between 1981 and 2008, while life satisfaction edged up by 5-10% overall (with most of the gains made over the decade of stable growth to 2008). But the recession that began that year led to a decrease in average wellbeing that erased all prior gains. Average wellbeing in Greece now stands at a level below historical records, despite real GDP remaining at a level well above historical figures (see Figure 1). The psychological costs of the recession cut even deeper than the negative growth numbers would indicate.

A better understanding of this asymmetric sensitivity has macroeconomic policy implications. On the one hand, a typical reading of the income-happiness paradox suggests that further growth in the developed world is a futile means to the end of improving wellbeing. On the other hand, researchers who find evidence of a positive relationship between wellbeing and GDP typically take from this that further economic growth is good for society.

Our findings suggest a more nuanced perspective: policy that is designed to engineer booms but which risks even relatively short busts is unlikely to improve wellbeing in the long run. Steady positive growth that minimises the risk of contraction seems the most likely route to improving general wellbeing.

Figure 1: Subjective wellbeing (SWB) and real GDP for Greece, 1980-2012


Jan-Emmanuel De Neve is an assistant professor in political economy and behavioural science at University College London and a research associate in CEP’s wellbeing programme. George Ward is a research assistant in CEP’s wellbeing programme. Femke De Keulenaer is at Ipsos. Bert Van Landeghem is at the University of Sheffield. Georgios Kavetsos is at the London School of Economics. Michael Norton is at Harvard Business School.

A short film about their study is available on CEP’s YouTube channel: https://www.youtube.com/watch?v=cOsWih883v8
Which national education systems deliver the best value for money? Peter Dolton and colleagues rank 30 of the world’s richest countries based on their expenditure on teacher costs (which account for 80% of education budgets) and the pupil outcomes they achieve. Finland, South Korea and the Czech Republic come out top of the list.

Educational efficiency: value for money in public spending on schools

Around 1.3 billion children are enrolled in primary and secondary schools around the world and each year governments spend trillions of dollars to educate them to the highest possible standard. In a recent report, we highlight which countries are using their budgets most effectively to produce the best outcomes for their young people.

Our ‘efficiency index’ is particularly relevant in the context of economic austerity. In most countries, public expenditure on school education represents a significant share of the total government budget. What’s more, the global proportion of public spending on education has, on average, risen for the past 20 years despite competition with other public services, such as health, transport and defence. Yet there are potentially large financial savings to be made if we can better understand the underlying relationship between resource inputs and pupil performance.

We analyse data from 30 Organisation for Economic Co-operation and Development (OECD) countries to ascertain which inputs funded by governments really do make a difference. We also look at which countries are combining these inputs most effectively to produce the best educational outcomes for each dollar invested.

The results are based on internationally comparable data collected over the last 15 years, using standardised scores from the OECD’s Programme for International Student Assessment (PISA). We also have other excellent data from the OECD, which help us to ensure that comparisons of each country’s education system are valid, and we test what impact each input has on children’s PISA scores.

Only two inputs have a consistent impact on educational outcomes: teachers’ pay and pupil-to-teacher ratios.
Only two inputs consistently prove to be statistically significant: teachers’ pay, and the pupil-to-teacher ratio in the classroom. The implication is that inefficiency in an education system can be a result of both underpaying and overpaying teachers or having class sizes that are too big or too small.

For example, if teachers are underpaid, it may be harder to recruit high-calibre individuals into the profession or to retain them: positive educational outcomes will suffer, which damages efficiency. Conversely, if teachers are overpaid, then it may be better to recruit more lower-paid teachers but spend more on reducing class sizes.

The two most efficient education systems – Finland and South Korea – have the third and fifth largest pupil-to-teacher ratios, which means larger class sizes. Inefficiency can also come as a result of either overpaying teachers – in countries such as Germany and Switzerland – or underpaying teachers – in Indonesia and Brazil. These countries occupy four of the bottom six spots in the overall efficiency rankings.

But our findings also suggest that on average, across all countries, the more money there is available to spend on teachers, the better results will be. This is perhaps not a surprising result as, on average, a country with more highly paid teachers draws their recruits from more educated graduates.

We take the analysis one step further and examine the ‘optimal’ combination of these two inputs within the available funding envelope: rather than require extra resources, could more be achieved with the same (or less)?

Educational efficiency is not immediately concerned with just raising PISA scores – but rather, as we live in a world of finite resources, with achieving the best educational attainment given a limited budget. With unlimited funding available, much more could be done to increase educational outcomes. But this is unrealistic: government budgets are limited, and spending needs to be prioritised accordingly to deliver value for money.

Our efficiency index is therefore a relative measure. Finland has been calculated to be operating at the notional maximum, but even that system could achieve more with less. For example, each education system needs to decide how much funding to invest in teaching materials, infrastructure, reducing class sizes or more highly paid teachers.

Our calculations show that Finland strikes the most efficient balance between teacher salaries and class sizes to produce educational outcomes. Using this as our benchmark for ‘maximum’ efficiency, we are able to calculate how PISA scores can be theoretically raised to Finland’s level by adjusting these two inputs – both of which are within the power of governments. Countries can use different combinations of teacher salary levels and class sizes to improve their educational outcomes.

Table 1 shows the efficiency index rankings by country; and Figure 1 shows the relationship between PISA scores and efficiency, grouping countries into five types by their relative position. We recognise that efficiency may not be the most important factor for some countries.

<table>
<thead>
<tr>
<th>Ranking</th>
<th>Country</th>
<th>Efficiency scores</th>
<th>PISA rank (2012 maths)</th>
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<tr>
<td>1</td>
<td>Finland</td>
<td>87.81%</td>
<td>5</td>
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<td>2</td>
<td>South Korea</td>
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<tr>
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<td>Brazil</td>
<td>25.45%</td>
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Figure 1:
Educational quality and educational efficiency: five groups of countries

Group 1   Elite performers
There is always room for improvement despite the fact that these countries score well in both efficiency and quality.
1 Finland 2 Japan 3 South Korea

Group 2   Efficient and effective
These countries are doing relatively well on both efficiency and producing high PISA scores.
14 Australia 15 Czech Republic 20 New Zealand 22 Slovenia

Group 3   More effective than efficient: overspending or bloated
These countries perform better in quality measures than in terms of efficiency This may be because they prioritise outcomes over costs; it may be because their system generates other outcomes that aren’t captured by PISA rankings; or it may be because the system is over-resourced beyond a threshold required to drive quality increases.
4 Austria 5 Belgium 6 Denmark 7 Germany 8 Ireland 9 Italy
10 Netherlands 11 Portugal 12 Spain 13 Switzerland

Group 4   More efficient than effective: underspending or underperforming
These countries are more efficient than educationally effective. This could be because of constraints that prevent the system from moving to the next level, for example, low salaries may prevent the teaching profession from being able to recruit highly skilled individuals; or if extensive resources are already being deployed, it could be that there are underlying flaws in the education delivery model the system has the potential to increase outputs for no additional inputs by making policy changes.
16 France 17 Hungary 18 Iceland 19 Israel 21 Norway
23 Sweden 24 UK 25 United States

Group 5   Inefficient and ineffective
These systems are inefficient and at the same time do not produce comparatively good outcomes.
26 Brazil 27 Chile 28 Greece 29 Indonesia 30 Turkey

Some countries will choose to pursue policies in which improving educational quality rather than educational efficiency is their most important goal.

This is an informed choice: but are the countries that are paying a premium for their education aware of it? If so, the additional benefits should be clearly defined for the taxpayer. If not, improving system efficiency should be of great interest.

Regardless of context, the index sheds light on the effectiveness of the spending choices made by those designing education policy. As governments seek to improve their education systems within financial constraints, we hope to inform debate about which items of educational expenditure are likely to make the greatest impact on the attainment of children.

On average, across all countries, the more money there is available to spend on teachers, the better results will be.

This article summarises ‘The Efficiency Index: Which Education Systems Deliver the Best Value for Money?’ by Peter Dolton, Oscar Marcenaro-Gutierrez and Adam Still, published by GEMS Education Solutions (http://www.gemsedsolutions.com/efficiency-index).

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