



Essays on medium- and long-term global trends

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EPRS | European Parliamentary Research Service

Global Trends Unit

PE 573.301 - October 2016

GLOBAL TRENDOMETER

Essays on medium- and long-term global trends
Autumn 2016

Study
October 2016

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LINGUISTIC VERSION

Original: EN

Manuscript completed in October 2016.
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PE 573.301
ISBN 978-92-846-0104-2
doi: 10.2861/653859
QA-06-16-063-EN-N

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1. Introduction

Ignoranti quem portum petat nullus suus ventus est.

*If you do not know to which port you are sailing,
there is no such thing as a favourable wind.*

Seneca¹

Global warming, demographic change, mounting inequality, changing balance of power, societal impact of the ongoing technological revolution: in the face of these and other global trends, the world in 2030 or 2040 may appear so unknown, so complex and so distant that it would seem vain to prepare for it, as 'no one has a crystal ball'. There is no shortage of crises - the euro, Greek debt, refugees, terrorism, Brexit - all calling for difficult and immediate political responses.

Moreover, how can political decision-makers take time out from dealing with the immediate agenda to focus sufficiently on long-term trends, and to manage the thousands of pages of detailed, specialist analysis produced by the major international think tanks and foresight centres?

Yet the need to draw a link between today's decisions and the long-term future is not a distraction. Prevention is better than cure, and steps which strengthen our 'resilience' are needed. With this in mind, the European Parliament has contributed actively to the development of the inter-institutional European Strategy and Policy Analysis System (ESPAS). As the Parliament's President, Martin Schulz, stated recently: 'In too many policy fields, there is a tendency to fail to address issues for the long-run ... This has to change.'²

With the publication of the first edition of this new 'Global Trendometer', the European Parliamentary Research Service (EPRS) seeks to enhance its contribution to strategic foresight and respond to the need to identify and track medium- and long-term trends. This publication presents an up-to-date analysis of a selection of key trends.

The *Global Trendometer* takes a close look at specialist analysis from a variety of reputable sources. Robust analysis, both of empirical data and of the historical experience, is central to the search for effective responses to the multiple challenges that are likely to face Europe in coming decades. This new publication does not offer recommendations, but it does seek to draw attention to relevant studies and to prompt reflection on how Europe can address future challenges.

The guiding principles of this work are:

- to offer European political decision-makers, and in particular the Members of the European Parliament, a concise overview of key medium- and long-term trends;
- to underline the complex, cross-sectorial character of many current challenges;
- to analyse trends from a specifically European point of view; and
- to show how perceptions of key trends differ and/or evolve over time.

¹ Seneca, L. A. *Ad Lucilium Epistulae Morales*. LXXI, 3

² President's Office, European Parliament (2015, December 17): Speech at the European Council by Martin Schulz, President of the European Parliament

The 2015 ESPAS report '*Global Trends 2030: Can the EU meet the challenges ahead?*' was the first document of its kind with a specifically European point of view. This is a fundamental reference and starting-point for the new *Global Trendometer*.

This inaugural edition includes more detailed analysis of three trends, one from each of the major categories identified by the 2015 ESPAS report:

- **Growing scarcity of water world-wide:** Apart from its human impact on the most exposed societies, water scarcity may lead to conflicts and forced migration. Europe could be affected both directly and indirectly, and faces considerable challenges as a result.
- **Increasing inequality:** Foresight reports repeatedly confirm this trend, particularly in the West, and see it as a pre-eminent concern. Inequality poses critical challenges for the process of European integration, in social, economic and political terms.
- **US military power in 2030:** Changes in the technological, political, economic and even social bases of the US could change the global order. What consequences are there for Europe?

The European Strategy and Policy Analysis System (ESPAS)

[ESPAS](#) aims to strengthen the EU's collective administrative capacity for foresight. It seeks to identify the main global trends and to provide the decision-makers of the participating institutions with informed, up-to-date analysis of long-term policy challenges and options. It is a joint initiative of the European Parliament, the European Commission, the Council of the European Union and the European External Action Service, with the Committee of the Regions and the European Economic and Social Committee as observers.

The 2015 ESPAS publication '[Global Trends to 2030: Can the EU meet the challenges ahead?](#)' summarised major existing and emerging trends under three broad categories: i) economic and technologic change, ii) social and democratic change, iii) geopolitical change.

The *Global Trendometer* then addresses a wider selection of trends in a schematic way, to bring out uncertainties about their further development and possible disruptions they may provoke. The chosen trends are: jobless growth; the Asian century; blockchains and trust; additive manufacturing; intolerance; the mobile internet and democracy; Russia and China and democracy in the Middle East and North Africa.

As a rule, the issues addressed have deep roots and will have long-term consequences. Comprehensive solutions will often involve complex and indeed difficult policy packages, and a great deal of coordination and willingness to compromise across and within Member States, the European Union and the wider international community.

The choice of a wide selection of topics is quite deliberate. Specialist knowledge in specific areas is critically important; but there is also a great need to be able to look across sectoral boundaries. This can help us to identify common challenges and to develop comprehensive and strategically sophisticated responses. In a period of rapid change, an understanding of the dynamics of different sectors, and of their interaction, can help us make the most of the opportunities that arise and minimise the risk of future crises.

Danièle Réchard, Head of Unit

2. Essays

I. Water Scarcity: an avoidable crisis?

Introduction

Water is essential to human life. Although the earth's water resources may seem plentiful – with around 70 percent of our world being covered in water – clean drinking water is quite rare. While the amount of freshwater has been relatively constant over time, demand has risen at a rapid pace. Already today, freshwater has become a scarce commodity in some parts of the world, and projections suggest that global demand will exceed current sustainable supplies by 40 percent in 2030 (World Bank, 2016). By 2050, around four billion people could be living in water scarce areas, according to the Organisation for Economic Cooperation and Development (OECD, 2008, 2012). Given this dire outlook, it is no surprise that the World Economic Forum's (WEF) *Global Risk Report 2016* lists water crises amongst the greatest global risks to future stability and growth.

This increase in water demand over the coming decades is expected to be mainly driven by demographic developments, rising living standards, and higher water needs in the agricultural, energy and industry sectors. This rising demand is exacerbated by climate change and has to be met by ever decreasing freshwater reserves. Water scarcity will have severe consequences, not only affecting individual hygiene and water intake, but also influencing food prices, exacerbating inequalities and possibly increasing conflict and migration. Europe in particular could be both directly and indirectly affected, and is facing considerable future challenges.

In light of this worrying trend and its cross-cutting effects, it is of utmost urgency to address the future effects of growing global water scarcity on a transnational level.

In many ways the issue of water scarcity exemplifies the advantages of a strategic foresight approach to policy design that favours *risk management* over *crisis management*. Water is expected to become scarce in the future and adversely affect our lives in various ways. The extent and severity of this effect, however, depends crucially on the investments we make today. As Mogherini put it on World Water Day 2016: 'Now is the time for action'.

Definition

Water scarcity usually implies a lack of *freshwater*. It refers to a situation in which water resources are unable to adequately satisfy water needs from all sectors within a region. Water scarcity can be due to physical scarcity (i.e. when water resources are unable to meet demands) or economic scarcity, where the lack of water is the result of mismanagement or insufficient infrastructure. The concept is defined in relation to corresponding needs and livelihoods (Dow et. al., 2005, 3), and is often used in conjunction with *water stress*, *water shortage*, *water risk*, and *water crises*.

What drives water scarcity?

Demand for water will rise substantially within the next decades, especially as a result of ongoing population growth. According to World Bank (2016) estimates, the global population may exceed nine billion in 50 years. Ongoing economic growth and rising incomes lead to an expanding global middle class (ESPAS, 2015). With countries becoming more prosperous and urbanised over time,

their water consumption increases. Already within the past century, water use has been growing at more than twice the rate of population growth (Pontiroli Gobbi, 2012). Forty percent of the population already suffers from water shortages for at least one month per year. If the current trend continues, four billion people could be living in water scarce areas by 2050, according to OECD estimates.

As of today, according to the US National Intelligence Council (NIC, 2012), the agricultural sector accounts for as much as 70 percent of global water withdrawals. Production will have to increase in the coming decades in order to feed a growing population. By 2030, demand for food is expected to increase by around 35 percent (NIC, 2012). Higher incomes are expected to lead to a shift from a predominantly starch-based to a meat-based diet in many parts of the world, which is considerably more water-intensive. Whereas growing one kilogram of rice requires 3 500 litres of water, producing the equivalent amount of beef requires 15 000 litres, according to the UN World Water Assessment Programme (WWAP, 2015).

In Europe, the industrial sector is one of the main water users, accounting for about 40 percent of total water consumption (Förster, 2014). Global water demand coming from manufacturing is projected to increase by 400 percent between 2000 and 2050 (OECD, 2012). The energy sector is another thirsty business: according to the WEF (2015), Europe currently uses 30 percent of its freshwater to generate energy. Some new energy sources (such as hydropower or biofuels), although generally favourable due to their low carbon emissions, can be very water intensive. Paired with the expected rise in energy demand by about 50 percent in the next 15 to 20 years, energy-related water consumption is set to increase considerably in the future.

Another pressure is that of water pollution, which can occur through the contamination of water with fertilisers, urban wastewater or industrial waste. Many of the pollutants can make their way into underground aquifers. Unsafe water conservation and storage often also increases the risk of contamination and the spread of diseases.

Climate change is expected to exacerbate future water shortages. On the one hand, precipitation patterns will change and become more concentrated, with wet areas becoming wetter and dry areas drier. In some countries in the Middle East and Northern Africa, precipitation is forecast to decline by up to 15 percent (NIC, 2012). On the other hand, extreme weather events, such as floods, droughts, high waters and heat waves are forecast to become more frequent and destructive, increasing risks and vulnerabilities (Pontiroli Gobbi, 2012). Small glaciers are expected to disappear within the coming decades in some regions – a vital source of freshwater for millions of people during dry seasons.

The problem is not just the availability but also the distribution of water. As the World Bank (2016) puts it:

Climate change is not expected to alter global supplies. Instead, the challenges are regional, due to the uneven distribution of water, and economic, due to poor management of water resources. Without substantial reforms, water-related shocks and trends will converge to produce growing scarcity in some regions of the world and growing excess in others. (p. 10)

Overall, the issue of growing water scarcity is one of increasing demand (through an explosive population growth, increasing need for agriculture, and higher rates of water consumption) met by a shrinking, unevenly distributed supply, and a continuous depletion of freshwater sources.

What are the effects of water scarcity?

With freshwater being essential for human life, a lack thereof would have considerable adverse consequences. Thirst, already an issue in many of the most affected countries, would become a worrying trend, especially amongst the poorest members of the population. Water scarcity does not only affect drinking, but also hygiene and thus the spread of diseases, either directly through a lack of available water or through unsafe storing conditions that increase the risk of infection (WEF, 2016).

From a macroeconomic perspective, rising water scarcity and increasing competition for water would harm the global economy. The estimated 55 percent rise in water demand between 2000 and 2050 will be primarily driven by increases in manufacturing and electricity (OECD, 2012). 'Economic growth is a surprisingly thirsty business', with productivity and performance closely tied to water availability (World Bank, 2016, p. 1). Future water shortages could therefore have strong implications for the global economy and lead to periods of negative economic growth. In countries most strongly affected by water scarcity, the World Bank (2016) predicts GDP growth rates to decline by up to six percent by 2050.

As the agricultural industry is responsible for most of the annual freshwater withdrawals, reduced water availability could lead to strong increases in food prices and food shortages. A spike in food prices would especially disadvantage the poor, who spend a larger share of their income on food. This could exacerbate existing inequalities and 'fuel social discontent over other economic issues such as low wages and poor governance' (NIC, 2012, p. 34). Eventually, these developments could contribute to growing state fragility in arid regions of the world, with long-term cross-sectional implications. State fragility in turn hampers governmental capacity for effective water allocation, potentially increasing shortages.

There is some disagreement over whether water shortage *per se* will increase conflict between countries. A report by the Strategic Foresight Group (2013) claims that a lack of water cooperation among countries sharing trans-boundary river basins exacerbates their risk of war³. The World Bank (2016), however, claims that even in the future, war between countries over water alone remains unlikely. Inter-community tensions may nevertheless grow as a result of water shortages. Already, evidence suggests that '[e]pisodes of droughts and floods are often followed by spikes in violence, civil war, and regime change in developing countries' (World Bank, 2016, p. 19). Still, it may be premature to argue that ecological degradation alone increases the likelihood of violence – there have been many instances where, instead of sparking war, water crises have initiated co-operation amongst previously hostile countries (Bauer, 2007).

With ongoing global warming, increasingly frequent extreme weather events and rising water scarcity, the term 'environmental migrants' is increasingly salient in contemporary debates⁴. Floods, droughts and other weather events could lead to large-scale demographic responses and encourage migration to less affected countries. It is hard to measure exactly whether environmental factors and lack of water are the primary reasons that make people migrate, due to the interrelation with political and economic concerns. Nevertheless, bad water quality and desertification are expected to be among the most important concerns driving future population movements.

³ Hsiang et. al. (2013) similarly find that changes towards warmer temperatures and more extreme precipitation patterns systematically increase the probability of conflict between countries.

⁴ Norman Myers, an environmental analyst from the University of Oxford, estimates that climate change refugees will amount to 150 to 200 million people by 2050 – a figure commonly cited by the IPCC (Brown, 2008, p. 11) and the Stern Review on the Economics of Climate Change (Stern et al, 2006).

What does this mean for the EU?

Europe will be both *directly* and *indirectly* affected by growing global water scarcity. According to the European Commission (EC; 2016) 'water is no longer the problem of a few regions, but now concerns all 500 million Europeans'. About half of the EU's river basins will be *directly* affected by water scarcity and stress by 2030 (EC, 2012, see also EEA, 2015). The strongest impacts will be in highly urbanised, densely populated coastal regions and in Southern Europe, and could adversely affect tourism, agriculture, industry, energy and transport sectors (EC, 2007).

Compared to other regions, the EU will most likely be spared from the worst direct effects of water scarcity. However, many of the issues outlined above can have adverse *indirect* effects. Already, we see that disputes over ownership and usage of water give rise to tensions that are expected to increase as time goes on. Conflicts and state fragility often stretch beyond regional boundaries, affecting the global economy, increasing security concerns and altering migration patterns. Some argue that, besides conflict, water scarcity in Syria has been one of the key factors driving the recent migration wave to Europe (e.g., van der Heijden et. al., 2015). According to the North Atlantic Treaty Organization (NATO, 2013), 40 countries in the Middle East and in Africa will suffer from insufficient water access by 2025. Environmental degradation and water scarcity could therefore further increase migration to Europe.

The importance of water management policies

Adequate and efficient water management can mitigate much of the costs of water scarcity. According to economic models by the World Bank (2016), inadequate water management policies can exacerbate the negative impact of water scarcity on economic growth, 'while good policies can go a long way towards neutralising them' (p. 1). In some countries, economic growth levels could even increase significantly in response to more reliable water infrastructure.

There is already international awareness surrounding the importance of water for the future; the United Nations recently included the 'availability and sustainable management of water for all' as one of their 17 Social Development Goal (SDG) to 2030. Awareness now has to be followed by action. The main policy recommendations of key publications on how to avoid water scarcity are summarised below. All organisations agree that the consequences of inaction will be severe, and that today's investment in water will yield large benefits for the future.

World Bank (2016) High and Dry: Climate Change, Water and the Economy

In its report, the World Bank proposes three overarching policy priorities to help establish water security and a climate-resistant economy. First, a better and more efficient allocation of scarce water resources within and across sectors through better planning, regulation and water pricing. Secondly, investing in storage infrastructure, water distribution and recycling will go a long way to expand water supply and availability. Leaks in distribution networks account for a significant amount of yearly water loss. Finally, it is necessary to build resilient economies in order to reduce the impact of extreme weather changes, climate uncertainty and precipitation variability.

World Economic Forum (2016) Global Risk Report 2016

The WEF addresses the devastating impact of water shortage on food supply in countries most exposed to climate change. To maintain food security in the years to come it is necessary to adapt agricultural methods to future water supplies, address food wastage, improve water distribution and increasing storage capacities. The report also stresses the need for private-public partnership, focusing on 1) improving big data processing to develop early warning mechanisms, 2) facilitating

insurance programmes protecting small farmers against variations in yields and income, and 3) encouraging climate-resilient investments.

Organisation for Economic Co-operation and Development (2012) Environmental Outlook to 2050: The Consequences of Inaction

The OECD calls for determined strategies that ensure coherence between ‘water policy’ and other policy areas, and emphasises the need to prevent tensions over trans-boundary water sources. It recommends a mixture of policies that combine adequate water pricing with investments in wastewater collection technologies and water storage capacities. Improving water supply and sanitation infrastructure in developing countries will help mitigate the risk of water-related disasters. The OECD advocates an increase in the proportion of official aid dedicated to water issues by its member states, but also, like the WEF, highlights the importance of the private sector.

National Intelligence Council (2012) Global Trends to 2030: Alternative Worlds

The NIC calls for investment in new technologies and agricultural efficiency to prevent food and water shortages. In many parts of the world, agricultural progress could be made by investing in seeds and fertilisers, and by making better use of irrigated land, which would take high amounts of pressure of existing water resources. Export controls should be introduced with caution, as they may exacerbate food shortages in other parts of the world.

Conclusion

With each new day, competition over scarce water resources increases. Water scarcity is expected to pose a severe challenge for the future, driven by population and economic growth, and exacerbated by climate change. Because of its essential role in almost all sectors, a lack of water would have far-reaching and diverse consequences, affecting, amongst others, the global economy, food security and migration patterns. The time to act is now – adequate water-management policies can still mitigate many of the future concerns and help alleviate the future costs of water scarcity. The EU is already at the forefront of ensuring water security, both internally (e.g., 2000 Water Framework Directive) and on a multilateral level, repeatedly highlighting the importance of water supply, sanitation and water diplomacy. An EPRS ‘Cost of Non Europe’ Report (Zandstra, 2015) on water legislation shows that, if fully implemented, existing legislation could already generate financial benefits of around €28 billion per year for the EU. Given the dismal forecasts by lead publications, however, many further steps need to be taken in order to secure sustainable water supply in the decades to come.

By Danièle Réchard with Arun Frey

II. Increasing inequality: from a social and political challenge to an economic problem?

Summary

This essay analyses the trend towards greater inequality as considered in recent foresight reports, with a focus on how perceptions of this trend are evolving. It examines in turn the economic, social and political challenges linked to inequality. It then addresses policy options for the EU in the face of a significant barrier to economic and social progress and to continued European integration.

Background

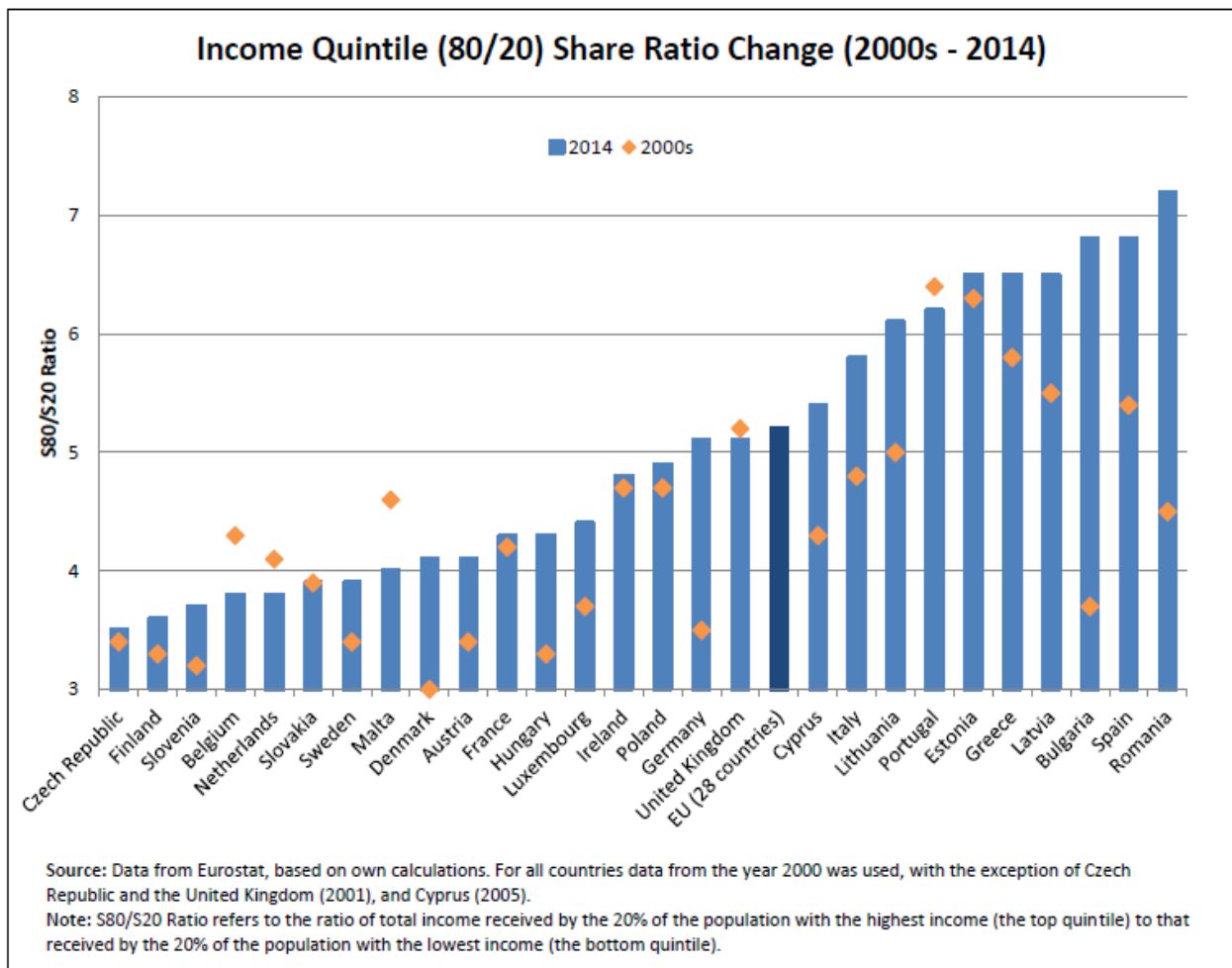
Authoritative foresight reports concur that economic inequality is a major trend. As the ESPAS report (2015) puts it, 'growing inequalities pose a major political, social and economic risk in the years to come' (p. 21). The WEF's current Global Risks Report (2016) states that 'excessive inequality lowers aggregate demand and threatens social stability, and can increase risks such as involuntary migration or terrorism caused by violent extremism. Rising inequality is also correlated to upticks in security problems, such as violent deaths or robbery' (p. 20). The OECD (2014) reports that income inequality has increased in the vast majority of OECD countries (p. 18). NATO (2015, p. 20ff) has now added inequality to its list of emerging trends - a further example of the greater priority being given to the problem.

Taken as a whole, these reports also show that perceptions of this trend are changing. First, consensus on the reality of growing economic inequality has strengthened. Second, while it has long been accepted that inequality increases the risk of social and political instability, it is now recognised that inequality is also in itself an obstacle to economic growth (Ostry, 2014; OECD, 2016). This adds urgency to the search for effective policy responses.

Economic challenges linked to growing inequality

There is a strong consensus that economic inequality is increasing, and that this is a long-running trend from the 1980s. Income inequality is easier to measure than other forms of inequality, and the relevant data has been extensively analysed in recent years. Figure 1 presents trends in income inequality between 2000 and 2014 in the 28 EU countries. This shows a general pattern of redistribution upwards: the income share of the top 20% (quintile) increased relative to that of the bottom 20% in most, though not in all countries. OECD data shows that the ratio of the income share of the top 10% to the bottom 10% rose from 7:1 in 1985 to 10:1 at present.

Figure 1



The effect of inequality on growth has been extensively researched and debated. While the reported empirical findings are inconsistent (Voitchovsky, 2011, p. 569), a recent OECD report (2016) finds that 'higher inequality drags down economic growth and harms opportunities,' (p. 15). A European Parliament committee hearing was told that 'economies that have greater inequality have lower growth, and this is a causal effect' (Pearson, 2016).

The relation between inequality and growth is nevertheless complex. Tax and transfer strategies to mitigate inequality may themselves harm economic growth, if misused (OECD, 2014). The option of doing nothing is comprehensively challenged by the work of Thomas Picketty (2013), who contradicts the traditional analysis that the trend towards inequality reverses itself over time. Stiglitz (2012) points out that rising inequality cannot be dismissed as 'the inexorable workings of the market economy' (p. 333). A reassessment review of historical evidence presented in an International Monetary Fund (IMF) discussion paper concludes that 'lower net inequality is robustly correlated with faster and more durable growth, for a given level of redistribution' (Ostry, 2014, p. 4).

Tax fairness

Tax fairness has emerged recently as a major strand of the inequality debate. Luxleaks, the Panama Papers, and studies of the dimensions of corporate tax avoidance have brought the issue into sharp focus. Zucman (2015; table 1 below) estimates the cost to countries of wealth being held offshore at

over €200 billion. The ease with which companies can relocate to places offering more favourable tax regimes adds to popular concerns about the negative side of globalisation.

Table 1
Wealth held offshore and tax revenue loss, by region

	Offshore wealth (US\$ bn)	Share of financial wealth held offshore	Tax revenue loss (US\$ bn)
Europe	2 600	10%	75
USA	1 200	4%	36
Asia	1 300	4%	35
Latin America	700	22%	21
Africa	500	30%	15
Canada	300	9%	6
Russia	200	50%	1
Gulf countries	800	57%	0
Total	7 600	8.0%	190

Source: Gabriel Zucman, [The Hidden Wealth of Nations - The Scourge of Tax Havens](#)

The fact that the tax share of corporations and high net worth individuals has lagged compared to the tax share of the bulk of the population is a particular concern in view of the prospect of a looming funding gap for welfare programmes. It is easy to understand a clamour for a concerted effort against large-scale tax avoidance.

Success in resolving this issue depends on cooperation between countries, not just at EU level but globally, as acknowledged by the Global Declaration against Corruption (2016) adopted at the London Anti-Corruption Summit in May 2016.

Impact of technological change

There is considerable concern about the consequences of the rapid technological change the world is currently experiencing. 'Some inequalities are being compounded by the current technological and industrial revolution. The possibility of mass unemployment linked to the emergence of new technologies is perfectly plausible' (ESPAS, 2015, p. 61; see chapter 3/I below).

Social challenges linked to growing inequality

The negative social consequences of greater inequality have been analysed in detail, for example by Wilkinson and Pickett (2009). They present a considerable body of evidence showing a close association between greater inequality and worse overall outcomes in health (including obesity, mental health, and life expectancy), educational performance, crime (including violent crime) and social mobility.

Other trends may exacerbate inequality. Demographic developments in Europe point to an increase in retired people, and a fall in the ratio of those contributing taxes to those receiving social assistance. This in turn points to a scenario of relatively better off pensioners on the one side, and workers facing an increased tax-burden on the other.

It is also known that 'growing inequalities pose an additional challenge for the sustainability of European social protection policies' (ESPAS, 2015, p. 62). The ESPAS report suggests that 'more efficient social safety nets are needed to underpin market flexibility and combat rising inequality' (p. 77). One implication is that increased social assistance costs will create additional budgetary pressures. This leads to the dilemma of finding additional funding for social expenditure, for example through greater taxation, or alternatively reducing entitlements and ending programmes considered ineffective.

It is clear that there is a correlation between stable societies, with good economic performance, and those with stronger welfare provisions and lower levels of inequality. The Nordic countries are the stand-out examples of this.

Political challenges linked to growing inequality

The impact of inequality on political systems is readily apparent. ESPAS (2015, p. 77) noted that inequalities affected the EU's cohesion and undermined its economic strength. The IMF (2016), among many others, sees a link between inequality and a more inward, less internationalist political tone: 'the causes are complex but certainly reflect growing income inequality as well as structural shifts, some connected with globalization, that are seen as having favoured economic elites while leaving others behind' (p. xiii). Some commentators see inequality as a significant factor in the result of the UK's EU referendum (Goodwin, 2016). Of course, perceived unfairness in economic status is not a new phenomenon: Aristotle identified this as a factor in the political turmoil of Athens in his day (Ryan 2012, p. 100ff).

At a certain point, rampant inequality can become an existential threat to democracy, and large scale social conflict becomes a plausible scenario. There is now greater recognition of the possibility that greater inequality can ultimately undermine national security, as illustrated by the addition of inequality to NATO's list of key emerging trends.

On the international front, some have drawn comfort from the indications that globalisation is reducing inequalities between developed and developing countries, notably due to the rise of India and China (ESPAS, 2015, p. 21). Bill Gates has also emphasised this point (Muggeridge, 2016). Although inequality within emerging economies has been reduced, this has come about against a background of extremely high levels at the outset. A key measure of inequality in the distribution of family income, the Gini coefficient, remains higher for emerging economies than for most European countries.

Policy options

Combatting increased inequality calls for measures reaching across many policy areas. The literature reviewed above stresses the importance of skills and education, women's participation in economic life, and tax and transfer systems which allow efficient redistribution. Labour market measures are also part of the solution.

On education, there is strong consensus that this sector plays a crucial role. The OECD (2016) points out that 'inequality has a negative impact on growth through the channel of human capital: the wider is income inequality, the lower is the chance that low-income households invest in education' (p. 60). A RAND report (Hoorens, 2013) for ESPAS notes that high levels of inequality in educational attainment are associated with higher income inequality. Machin (2011) confirms that 'there is now a broad consensus on the issue of the existence of positive economic returns to education' (p. 426).

As the OECD (2014) notes, 'further improvements in educational attainment levels can support equity and growth' (p. 47). Yet there is no automatic mechanism leading from education to less inequality. 'Under certain circumstances education can provide the route out of disadvantage [...] In other circumstances education reinforces already inexistent inequalities and can result in increased inequality [...] education has been becoming more important for labour market outcomes and those left behind ... are penalised more heavily'. A key interim step is 'to devote resources towards increased and improved skill formation' (Machin, 2011, p. 426-7).

On the relation between gender equality and income disparities, OECD (2016, p. 211) research shows that an increase in the proportion of households with women working full-time over the past decades has had the effect of countering the trend for income inequality to increase. Given that 'increasing participation of women in the labour force has a significant effect on economic growth,' the OECD (2016) concludes that 'policies to increase the earnings potential of low-earning women are needed to further strengthen the effort' (p. 210).

As regards taxation, there is consensus on the importance of reform of tax systems and practice (OECD, 2012). Paradoxically, inequality can impede growth if it calls forth the wrong redistribution strategies – the treatment can be worse than the disease. But redistribution generally appears to have a benign impact on growth; only in extreme cases is there evidence to suggest a negative effect on growth (Ostry, 2011, p. 4). For the OECD, the remedy includes reforms to ensure that the wealthier pay their fair share, also by improving tax compliance and by closing tax loopholes. A reassessment of the role of taxes on wealth, including on the transfer of assets, is also needed (OECD, 2016, p. 79). Initiatives promoting tax fairness require improved tracking of data to uncover non-compliance, as well as enhanced sharing of data across national boundaries. This also calls for the allocation of sufficient resources to do the job.

On the global challenge of large intercontinental prosperity gaps, which remain a key driver of mass migrations, strong and coordinated international efforts are needed. It remains important to protect the framework allowing international trade, which is still a major contributor to prosperity nationally and internationally.

On the labour market, the spread of non-standard jobs in what has been termed the gig economy is seen as an important driver of income inequality (OECD, 2016, p. 136). Reduced job security is associated with increased income inequality. It follows that the long-standing emphasis on structural improvements should not be interpreted as a mandate to loosen labour market conditions, if the outcome is greater reliance on non-standard work. At the same time, there are indications that further digitisation and technological innovation will have a major impact on many jobs. Strategic planning is needed to forestall the threat of a sharp and lasting rise in unemployment.

Perceptions about the trend towards increased inequality and the steps needed to mitigate it have evolved considerably in the past decade, and this has also involved a reassessment of economic data. Continued robust analysis, both of empirical data and of the historical experience, is essential to inform policy in the coming years. We do not have all the answers to the problem of increasing inequality; we are at a frontier of knowledge, and one which needs to be pushed forward.

Concluding remarks

One prognosis is that 'while material conditions for most people are likely to improve over the next 30 years, the gap between rich and poor is likely to increase' (NATO, 2015, p. 21). Increasing inequality poses complex challenges, with economic, social and geopolitical dimensions. A strategy to mitigate it will involve initiatives across many different policy areas. There is a need for broad agreement on the division of labour, burden sharing and distribution of competences across EU

institutions, Member States, and other relevant bodies. This brings the focus around to improved governance, better policy coherence and better policy efficiency, and to three elements highlighted by the OECD Productivity and Inclusiveness Nexus:

- Improved capacity for joined-up action
- Reinforced institutional structures, and
- Improved international (and inter-instance) cooperation.

Without active counter-measures, the likelihood is that economic inequality will continue to increase, and its impact will become increasingly serious. A key takeaway of the ESPAS (2015) report remains valid: 'the search for a better balance between inequality, redistribution and growth will continue to shape the political agenda'(p. 51).

By Eamonn Noonan

III. Foundations of US military power in 2030: leading from the front or from behind?

Introduction

Today, after the cold war struggle for military supremacy and the period of undisputed military dominance, the United States has to cope with changing global circumstances and to confront formidable challengers. In response to this situation, the USA has recently started to work on what it calls the 'third offset strategy', a research programme on new technology and its use in the military.

This essay portrays the possible and probable long-term future of the technological, political, economic and social foundations of US military power⁵, in order to better understand likely shifts in global foreign policy, changes in US self-perception and new policy challenges for Europe.⁶

Past US military dominance

Since the start of the Cold War, the United States founded much of its strategic military power on technological superiority (Work, 2015), in order to 'compensate or *offset* the numerical advantages'⁷ (Brimley, 2014, para. 6) of the Soviet or the Chinese armies. Through strategies now called the first and second offset, the US developed robust nuclear deterrents in the fifties, and microelectronics and IT in the seventies and eighties. The products of this second offset - called the 'Revolution in Military Affairs' (RMA; Ibrügger, 1998) and consisting of 'networked precision strike, stealth and surveillance for conventional forces' (Hagel, 2014, p. 2) - made the United States military of the 1990s and 2000s unrivalled on a conventional battlefield. In particular, guided munitions allowed it to engage any enemy with deadly precision from a safe distance. The Gulf War of 1991 proved to all strategic challengers of US military power - competing countries as well as non-state actors, such as terrorists - that they would not be able to compete in a conventional war with the West.

Technological superiority was not the only aspect of US military power during the Cold War. Equally important were factors involving democratic control over armed forces, international reach, economic and industrial strength, an effective education system, high trust in the armed forces, and the sufficient quantity and quality of recruits.⁸

⁵ **Military power** is difficult to define. Experts argue over what is more important, the material, political and economic basis for armed forces – e.g. the renowned economic argument in Paul Kennedy's 'Rise and Fall of Nations' – or their effectiveness in deploying and fighting – e.g. Stephen Biddle's 'Military Power: Explaining Victory and Defeat in Modern Battle'. Here we focus on the first view, analysing the long-term changes in the political, economic, social and technological foundations of US military power. By focusing on the future of *military* power, we necessarily need to limit the discussion on the future of US foreign policy, cultural strength or the evolution of alliances.

Main sources on future issues are the following foresight reports: The EU Institute for Security Studies' (EUISS) 'Envisioning European Defence' report (Andersson et al., 2016) and 'Arab Futures, three scenarios for 2025' (Gaub & Laban, 2015); NATO's 'Strategic Foresight Analysis 2015 Interim Update' (NATO, 2015); the UK Ministry of Defence's Development, Concepts and Doctrine Centre (DCDC) 'Future Operating Environment 2035' (U.K. MoD, 2015); Global systems on a brink: Pathways toward a new normal (Burrows & Dynkin, 2015) by the Atlantic Council and the Institute of World Economy and International Relations of the Russian Academy of Sciences (IMEMO) and 'Global Trends to 2030' (ESPAS, 2015), but also selected political analysis, official statements and documents.

⁷ And, to a lesser extent proximity to probable areas of operations.

⁸ Discussing the relative importance of these forces in US history is beyond the scope of this paper.

The present - a mixed picture

Many of these factors behind US military primacy have eroded:

The results of the second offset wear off. Due to the effects of the 1991 Gulf War, the main challengers of the United States found alternative ways to deter the sole remaining superpower from being too active in their immediate areas of interest. In the 2000s, these strategies gave way to more conventional military strategies, including copies of RMA and effective but cheap weapons such as intermediate range missile systems and Improvised Explosive Devices (IEDs).

After an initial period of deterring the USA mainly through non-military means (e.g. notion of unrestricted warfare [Barno & Bensahel, 2016], offensive cyber capabilities, influence over global trade and finance), China gradually complemented this approach with military means, by denying the USA the possibility to safely access the South and East China Sea. This so-called area-denial and anti-access-, or AD/A2-Strategy (Freier, 2012, compare with: Haas, 2016), focuses on endangering the US military with standoff weapons - mainly missiles - which make operating inside the East and South China Sea very dangerous. This meant that any country coming to the aid of Japan, Taiwan or Korea in a regional conflict would have to anticipate heavy casualties. In particular, bases, aircraft carriers and aircraft became more vulnerable to guided missiles.

Russia in the 1990s relied on strategic nuclear deterrence (Trenin, 2016), but started in the 2000s to reform its armed forces (Gressel, 2015). In addition, it developed new ways to secure influence in the near abroad through an aggressive and difficult-to-respond-to 'hybrid war' strategy (Russell, 2015; see also: Whitmore, 2015).

Finally, global jihadism under Al-Qaeda in the 1990s developed its approach of spectacular terrorist attacks, because it could not attack the USA and its allies directly. Now, ISIS tries to conventionally fight its way to a caliphate. Terrorist tactics and extreme brutality are means in a conventional war which are intended to deter western ground forces, recruit fighters and weaken enemy morale (Cronin, 2015).

In addition, the second offset has led to adverse effects. As US Lt.Gen. H.R. McMaster (2015) noted:

Advocates of what became the orthodoxy of the "revolution in military affairs", or RMA, predicted that advances in surveillance, communications, and information technologies, combined with precision strike weapons, would overwhelm any opponent and deliver fast, cheap, and efficient victories. War was reduced to a targeting exercise. These conceits complicated efforts in Afghanistan and Iraq as unrealistic and underdeveloped war plans confronted unanticipated and under-appreciated political realities (p. 7).

In the last years, the USA has seemed to disengage from the rest of the world. President Obama has just ended 15 years of fighting polarising wars. After the economic crisis, US citizens prefer their government to deal with national challenges such as inequality and migration (Pew Research Center, 2016). There is talk of diminishing interest and capability of the US to act as a 'global policeman' (Kagan, 2014; Allin & Jones 2012). Allies, be it NATO, Japan or Saudi Arabia, question the US commitment.

This comes at a time of rising authoritarian assertiveness on the part of actors who seem to be faster in catching up on military technology, more ruthless in researching issues bordering on the unethical and in using new technological advances, and generally less risk averse in the use of violent means. Finally, nation states in general seem to be lagging behind in agility and adaptability when faced with new types of actors, especially networks, be they real or virtual.

US defence and R&D spending is lower than it was during the heights of the Cold War. It remains very significant, however, and will most likely stay so, if there is no paradigmatic change in the US foreign policy strategy (Walker, 2014). Nevertheless, the economic strength of the US declines in comparison to China.

Democratisation and globalisation of information and, more specifically, proliferation of defence-related knowledge, works in favour of less developed nations. Inventors experience more difficulty in keeping knowledge compartmentalised and countries such as China have professionalised the activities of intellectual copying and industrial mimicking. This also makes the development of weapons by copycats much cheaper than for the USA or Europe (Alexander, 2013).

Social trends seem to be the only ones in the United States' favour: Trust in the US military is still very high (Pew Research Center, 2013) and a good education and the free flow of ideas still provide the basis for military performance and adaptation through research (McMaster, 2015).

US response to challengers and changing trends

The US responses to the challengers were the 'Pivot to Asia', a combination of diplomacy and deterrence countering Russia and the so-called war against terrorism. Numerous policies to counter the political, economic and social trends brought mixed results.

In order to counter the turning of the tide in the technological area, in 2014 the current US administration, along with most of the defence community (industry, academia, think tanks etc.) started to push for a third offset in the realms of artificial intelligence, autonomous systems and robotics (Pavluk & Cole, 2016). This involves investing in new scientific breakthroughs, applied technologies and corresponding changes in the military.

The current debate among American experts on this third offset is well summarised by Bialos and Koehl (2016), when they ask: 'Is the US qualitative edge over its adversaries really eroding? Is a sustained offset realistic at all? Is Russia that important in considering the future U.S. forces? Are autonomy and AI really the most important technologies? Is an offset strategy useful that is geared for a likely conflict against a big power, considering that the US regularly fights irregular conflicts?'

The future - trends and uncertainties regarding the foundations of US military power

Geopolitical Future

All foresight report explicitly mentioning the military strength of the USA (ESPAS, 2015; NATO, 2015; DCDC, 2015) conclude that by 2030 (and 2035) the United States will still be the world's leading military power. According to DCDC (p. 2), the US and China will 'have the capability to dictate global events and potentially challenge world power' and China will be the second most single powerful country. According to Stratford (2016), China's military rise depends on two factors: the date of the eventual end of China's high-growth era, and the ultimate dominance of one of two narratives: aggressive Chinese nationalism or trust in civilisational and commercial pull, with a defensive military posture and conservative grand strategy.

If Russia does not come up with an alternative way to finance its ever more capable, but expensive, military, this could erode the social contract between the leaders and the population, leading to instability (Trenin, 2016). Thus, although Russia might be more powerful than at any time after the Cold War, this trend is unlikely to continue to 2030 (see below: chapter 3/VII).

Finally, global jihadism will most probably endure until 2030, even if there is a considerable likelihood that ISIS will be defeated and replaced by some other form of violent organisation. One

major disruption ending violent jihadism could be the rise of electoral Islamism (Gaub & Laban, 2015; see below: chapter 3/VIII). Expanding cyber space, difficult urban environments and globalisation will make it possible for all kinds of terrorist groups to survive and prosper, despite potential means of surveillance becoming more and more powerful.

As shown by the ongoing debate of neoconservatives around Robert Kagan (2014) and his realist sceptics (Switzer, 2014), the US foreign policy elite is split on the question as to whether US power decline is the result of political will, and therefore possibly reversible, or a given fact that needs to be managed. Depending on the position of the next administration in this debate, the in-coming president might discontinue or expand the expensive strategy of the third offset.

US military power would also be severely endangered, if by some disruption, 'US capacity would be stretched to the breaking point' (Burrows & Dynkin, 2015, p. 5). This instability could be created through home-made isolationism, China finding enough partners (e.g. BRICS) in an aggressive campaign for a parallel non-western order, or NATO being unable to continue as an effective alliance.

Withstanding US continued leadership, all foresight studies analysed for this essay stress the importance of a growing multipolarity in international relations. No matter if they base their finding on the decline of the US and the strength of Asia, or the many trends that build a more globalised and therefore decentralised world, the future will include many more political actors that have considerable power over global questions. As NATO (2015, p. 7) recaps, 'historically, major power shifts between states and regions occur infrequently and are rarely peaceful' (Allison, 2015) and 'in a polycentric world, this set of rules (and international norms) will be less evident and more contested, resulting in a need for dialogue and negotiation' (p. 8). This trend might limit military action in the future or lead to many small military conflicts with changing coalitions and the higher risk of big power conflict. Key uncertainties will be the reform of globalised regimes like the UN, the future of stabilising powers like India, the global rise in aggressive nationalism and protectionism and a possible alliance between Russia and China (See below: chapter 3/VII).

Although most arguments for the long-term global implementation of democracy are still valid, for the medium term, democracy as a 'brand' has difficulties, especially due to theocratic and authoritarian challengers. NATO (2013; 2015) has downgraded its positive projections of a gradual transition towards democracy from 2013 to 2015. It is uncertain, if democracies like the USA and its allies can go through difficult reform processes and at the same time prevail against autocratic and totalitarian challengers.

DCDC (2015, p. 13) reports state that the nation state and national armed forces will remain the central actor in 2030, but that a wide range of non-state actors - global opinion leaders, companies, international organisations, political movements, organised crime and terrorism - will be more important and that lines separating these groups will become blurred. The dwindling power of the nation state is creating a backlash in many countries. 'The loss of national sovereignty is a growing battle cry for those opposed to globalisation' (Burrows & Dynkin, 2015, p. 4).

Economic Future

Regarding the economic foundation of the US, the ESPAS report (2015) notes that 'an 'economic G3' – United States, China and the European Union – will dominate, with China expected to rise to first place' (p. 23f; see below: chapter 3/II).

The future of defence innovation will be heavily influenced by commerce, highlighting the need for more and novel forms of cooperation and sharing between the public and private sector. Current

drone innovations reveal cycles of military and civilian innovation. While the military cracked the massive costs of initial research, civilian research excelled in miniaturisation and scaling production. As the rate of technological change accelerates, defence production will have to cope with the problem of ever-increasing costs, shorter life cycles and more adaptive opponents.

In particular, the rising cost of armaments, with weapon programmes like the F-35 and the new 97 billion US-dollar strategic submarine replacement, is becoming increasingly unbearable for the USA (Majumdar, 2016). Here, the main trend is internationalisation of weapons research. A disruption could be the evolution of swarming, where many cheap automated weapons overcome expensive ones.

Regarding the effectiveness of state sponsored research, the third offset just might be the project to prove or disprove Mariana Mazzucato's (2015; Wolf, 2013) notion that states are the most efficient funders of game-changing technology, especially dual use goods.

Technological Future

The world will be much smaller in 2030, especially in terms of information and knowledge. Proprietary knowledge might be nearly impossible in the long run. The more the internet of things and additive manufacturing (see below: chapter 3/IV) become available, the more cheap choices of weapons will be available for groups and individuals. At the same time, weaker states and sophisticated non-state actors might have the knowledge necessary to develop weapons of mass destruction and the relevant guided delivery systems. Nuclear weapons might become a 'weapon of the poor', 'used against adversaries' superior conventional forces' (Burrows & Dynkin, 2015, p. 9) with the risk of immediate escalation. The cycle of ever more spectacular attacks might make terrorist groups prioritise such means (DCDC, 2015, p. 12).

As mentioned earlier, AD/A2 capabilities will be an important feature of the current, and possibly also future, arsenal of opponents of the USA. The DCDC (2015) report lists, *inter alia*, anti-ship, conventional and nuclear ballistic missiles, loiter-capable, automated systems (including submarines) and weapons of mass destruction.

According to the same report, more advanced nations will also focus on anti-satellite weapons and high-altitude platforms, while the less advanced will focus on professionalising the use of proxy warfare and state-sponsored terrorism. On the modern battlefield, western armies will encounter intelligent mines and guided munitions, directed energy and electromagnetic weapons and swarming and automated weapons of all sorts. Also important will be advances in nano-technology and advances in improving the body and mind internally or externally.

Highly developed 'western' armies will counter with many of the same trends: automation of all kinds of physical and cyber systems, intelligent, real-time big data analysis, communication and control, autonomous disruption of enemy networks through offensive electronic warfare and cyber capabilities, and new ways of engaging enemies with even more precision.

Regarding all things cyber, the reports analysed vary when it comes to the importance of dangers and potential. Much will depend on future vulnerabilities, the realisation of the internet of things and possible (international) control and verification. In robotics, autonomous systems and artificial intelligence, it depends on how fast the technologies will develop, how cheap they will be as weapon systems, and if potential arms races can be avoided. The Munich security conference report (2016) highlights the potential for these weapons in subduing civilian populations and lowering the threshold of conflict. Unlikely but paradigmatic breakthroughs would be quantum computing, defensive weapons rendering (even hypersonic) missiles useless and leaps in artificial intelligence.

Social Future

The most important social uncertainties are war weariness and the future of political participation. As a result of *inter alia* the middle-eastern wars, this generation (similar to the post-Vietnam generation) is very divided on the use of military force in international conflicts; influences in the next generation are unclear (Pew Research Center, 2016). The future impact of social media in security politics (see below: chapter 3/VI) is also unclear. On the one side it replaces expert journalism scrutinising the military, but on the other side it provides new actors to participate in the political discourse.

Europe and the decline in US military power in 2030 - So what?

‘The EU’s Common Security and Defence Policy is mainly limited to relatively small, short-lived and low-end crisis management missions and operations in third countries (and) suffers from a lack of commitment and a lack of resources’ (Andersson et al., 2016, p. 5). Current crises might change this, but they also shift attention to NATO. The next years will be very important and might lead to either a permanently reduced or even suspended role, or various forms of common action (Andersson et al., 2016).

According to a study commissioned for the European Parliament (Mauro & Thoma, 2016, p. 7), defence research in the EU has ‘declined sharply since 2006. Between 2006 and 2013, European Defence Agency countries’ R&D has been reduced by a staggering 29.2 %, from EUR 9.7 billion to EUR 7.8 (...) twice the rate of defence expenditure (14.7%)’.

Still, in 2030, most foresight studies predict that the EU is ‘likely to continue to play a greater security and defence role’ (DCDC, 2015, p. 13). This could happen inside or outside the existing treaty framework (Andersson et al., 2016, p. 6). The EU will probably still be a relatively weak security actor compared to the USA, Russia or China, not for want of military power, where it will likely be second or third behind China, but because of a lack of effective defence coordination, and of coherence, decisiveness and interest in global security issues. Without positive changes emanating from Russia, the European neighbourhood will be more unstable.

Regarding the third offset, defence experts such as Daniel Fiott (2016) ask how it might affect European capability development and if it could ‘also create a larger technological gap between NATO states?’ In addition, Luis Simon in The Journal of Strategic Studies (2016) asked if Europe might need an offset strategy of its own, because it faces similar A2/AD issues in its east and south. There are currently plans for an EU-funded Defence Research Programme (EDRP) led by the European Defence Agency in the next Multi-Annual Financial Framework from 2021-2027 (Group of Personalities on the Preparatory Action for CSDP-Related Research, 2016).

No matter how one thinks of the many normative questions surrounding this topic, the wider implications of any shift in the military power of the USA will be huge. In addition, most of the technological, political, economic and social global trends referred to above are not set in stone, but to change their course will require concerted will and efforts on the part of the EU.

By Leopold Schmertzling

3. Vignettes

The Asian century: economic powerhouse or stuck in transition?

By Marcin Cesluk-Grajewski

Background

Asia is likely to eclipse Western Europe and the United States in a shift of economic power over the next five decades, regaining the dominant economic position it had some 300 years ago. Two influential studies, from the Organisation for Economic Co-operation and Development and from the Asian Development Bank, predicted several years ago that the **21st century is likely to be dominated by Asia** - the 19th century having belonged to Europe and the 20th century to the United States - if that continent's governments pursue policies of inclusive growth, innovation, good governance and avoid what economists call the **Middle Income Trap**.

More recent studies from the Economist, PricewaterhouseCoopers and KPMG confirm the rise of Asia. This is a trend that started in the 20th century, with the rapid economic growth of Japan, followed by South Korea, Singapore and other Asian Tigers, and now continues with the expansion of China, India, Malaysia and others. China already overtook the United States in 2014 as the world's largest economy relative to purchasing power (PPP) and is likely to do so in market exchange rate terms before 2030.

Driven by **technological development, urbanisation and growing domestic consumption**, as people are driven out of poverty, Asia's per capita income could rise six-fold by 2050 to reach Europe's current levels, which would make some three billion Asians affluent by current standards. Western Europe and the United States would still top Asia in terms of per capita GDP and living standards.

Under an optimistic scenario, which assumes a benign international environment, including trade liberalisation and free movement of capital and technology, Asia's share of global gross domestic product will rise from 26% in 2000 and 32% in 2014 to more than 50% in 2050.

Under the 'Asian century scenario', Asia's GDP could reach US\$ 174 trillion in 2050, accounting for 52% of global output, compared with 18% for Europe and 13% for North America, according to the Asian Development Bank. But if the 'Middle Income Trap scenario' materialises, Asia's GDP could only be US\$ 65 trillion in 2050, accounting for 31% of global output, compared with 28% for Europe and 21% for North America. The more recent study of the Economist Intelligence Unit paints an optimistic picture, forecasting that Asian countries would

account for 53% of global GDP in 2050.

The rise of Asia will be part of a wider trend that will see the **evolution of most developing countries**, whose share of global GDP will rise to 57% by 2030, according to a study by consultancy KPMG. China and India alone will account for 25% of global GDP by that year and for 35% of the world's population. A PWC paper forecasts that China's share of the world's GDP in purchasing power terms will increase from 16.5% in 2014 to a peak of around 20% in 2030 before declining to around 19.5% in 2050. India's share of global GDP in PPP terms could increase steadily from just under 7% in 2014 to around 13.5% in 2050.

India could overtake the EU and the United States in terms of its share of the world's GDP in PPP terms by 2044 and 2049 respectively. Given the rise of India and China, the USA's share of world GDP in PPP terms will face a steady decline from around 33% in 2014 to around 25% by 2050.

Main Sources

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- Asian Development Bank (2011) [Asia 2050: Realizing the Asian Century](#).
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Possible disruptions

- **Japan** could overcome its economic stagnation, which has lasted for more than two decades, reinforcing the economic rise of Asia.
- **China's** impressive economic growth could crumble due to political instability resulting from growing inequalities or inefficiencies of the system ruled by the Communist Party.
- **Global warming** could undermine coastal populations, where China's economic activity is centred on and/or threatens its agricultural sector and those of other Asian countries.
- **Brewing conflicts** between China and Japan could escalate, destabilising the situation in the region. Such destabilisation could also result from a major conflict involving North Korea.

Key uncertainties

Asia's rise will depend on **internal policies and external factors**:

- Ensuring inclusive economic growth. **Increasing inequality** may undermine social cohesion, posing a threat to stability. China's interior is unlikely to grow as fast as its coast regions, making it necessary to redistribute wealth to poorer areas.
- Growing wealth often leads to **demands for democratisation**, which could pose a challenge for China's ruling party. Evidence suggest that such demands appear when GDP per capita exceeds US\$ 15 000, a threshold China passed recently.
- Avoiding the **Middle Income Trap**, where countries are caught when they are no longer able to compete with low wage economies in manufactured goods and are not yet capable of competing with advanced economies in high-skill innovations. A good education system is key to avoiding the trap.
- **International competition** for limited natural resources and a rise of **populism and xenophobia** could lead to trade and investment protectionism.
- Poor governance and **weak institutional capacity** would harm growth.

Main Trends to 2030

Most Asian countries could increasingly harness the full potential of technology, innovation and entrepreneurship, following in the footsteps of Japan, the South Korea and Singapore. In this case, the **countries will become creators**, not just buyers, of advanced technologies.

Asia is likely to continue to **undergo massive urbanisation**, creating industrial and technological clusters characterised by high productivity. By 2050, Asia could be transformed, as its urban population is expected

to nearly double from 1.6 billion to 3 billion.

Asia will **develop new financial centres**; with its share of global GDP rising to 50% or more, it should also therefore have about the same share of the world's financial assets, banks, and equity and bond markets. Economic expansion is expected to create a **virtuous circle** of growing purchasing power of people, which will boost domestic demand and consequently bolster production of goods and services.

The increased economic influence is likely to translate into **more political and military power**, allowing Asian countries to play a greater role in international institutions, such as the United Nations and the International Monetary Fund. Having more influence, Asian countries may take more ownership for solving global problems, such as climate change, energy conservation and resource scarcity, according to a PricewaterhouseCoopers study.

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Jobless growth: will robots and computers destroy our jobs?

By Marcin Cesluk-Grajewski

Background

Renowned economist John Maynard Keynes predicted nearly 80 years ago that the world would face **'technological unemployment'** 'due to our discovery of means of economising the use of labour outrunning the pace at which we can find new uses for labour.' Most mainstream economists say that the current technical revolution is set to destroy many jobs, but that it will create enough new ones to prevent unemployment from spiralling out of control.

This is what happened during previous industrial revolutions. But a growing number of experts believe that Keynes' prophecy **may materialise in the 21st century**, although wise government policies may significantly alleviate the process.

Drones delivering goods, driverless cars, computers offering medical diagnoses, fully automatised manufacturing lines and call centres, self-serving kiosks, algorithms replacing accountants, machines replying to emails, computerised legal and tax assistance as well as programmes writing news stories are just some examples of digitalisation and automation that may destroy more jobs than they create.

The contribution of labour to gross domestic product would thus shrink.

According to some estimates, 47 per cent of total employment in the United States is in a high risk category, and potentially automatable, a study by Martin Oxford School showed. A McKinsey predicted that technologies could automate 45 per cent of the activities people are paid to perform and that about 60 per cent of all occupations could see 30 per cent or more of their constituent activities automated.

In the past, **technological progress shifted the composition of employment**, first from agriculture to artisan shops, then to manufacturing and clerical work and finally to service and management occupations. Since the 1970s, there has been a decline in employment in routine-intensive occupations, consisting of tasks that follow well-defined procedures. Human telephone operators have almost disappeared, as have most reservation officers, and many members of the office staff, many cashiers and warehouse workers.

Investment banks are further automating their trading routines and back-office operations. Law firms are replacing the work of paralegals with data mining programmes, while hospitals are increasingly using computers for diagnoses and health monitoring. Massive Open Online Courses are reshaping education systems. Sharing economy firms

are remodelling passenger transport and tourism. Already in the 1980s, Nobel Prize-winning economist Wassily Leontief wrote that 'the role of humans as the most important factors of production is bound to diminish in the same way as the role of horses was first diminished and then eliminated.'

However, automation is likely to eliminate relatively few jobs entirely. Rather, it will **take over varying parts** of their constituent activities, with predictable physical work, data processing and data gathering being the most feasible to be automated. Managerial jobs and those involving the application of complex expertise are the least prone to automation. Unpredictable physical work, such as forestry or animal breeding, will also be difficult to automate.

Finally, even if certain activities can be automated, it does not mean that they will be, as the process will also be determined by the **cost of labour**. If cheap workers are easily available while machines are expensive, jobs are still likely to be performed by humans. The jobs of bookkeepers and accountants, for example, require skills and training, so they are scarcer than simple cooks. But the activities they perform cost less to automate, requiring mostly software and a basic computer.

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Key Uncertainties

- The **pace of innovation itself is uncertain**. Some experts anticipate its exponential growth and an imminent explosion of new technologies in the areas of big data analysis, robotics, machine learning and artificial intelligence. Others say progress will be limited to the fine-tuning of the currently available applications.
- Armed conflicts, climate change, the rise of populism and other factors may lead to **protectionism**, winding down globalisation and harming technological change.
- **Politics may stop or slow innovation**. Decisions as to whether to adopt innovation can be resisted through non-market mechanisms and political activism, for example by government action to protect certain sectors.
- Future employment will depend on whether **education systems** are overhauled to equip people with the right set of skills, including hard ones, such as software design and soft ones, such as social intelligence.

Possible Disruptions

- Technological breakthroughs could provide key disruptions. If machines were to develop an **understanding of natural language** on a level similar to human beings, the process of automation would advance rapidly, notably in retail, finance, insurance and healthcare.
- The development of **artificial intelligence** would potentially open the way to unlimited automation.
- A **major war** could sever links in the global interconnected economic system, slowing innovation and automation.
- **Cyber wars** or, generally, an inability to maintain cybersecurity, would severely limit automation of white collar jobs in areas such as tax advice, law, accountancy and investment banking.

Main Trends to 2030

Most routine professions are likely to be **gradually automated**, except for those when human contact is valued. Cognitive/non-routine jobs will continue to be done by people, barring the development of artificial intelligence.

‘Winner-takes-it-all’ markets, products and people are emerging, in which the best performers are able to capture a very large share of the rewards, and the remaining competitors are left with very little. However, **start-ups** find it increas-

ingly easy to **challenge incumbents**. **Market polarisation** will continue, with growing employment in high-income, cognitive jobs and low income manual occupations, accompanied by a gradual reduction of middle-income routine jobs.

Social inequalities which began to grow in the 1980s, may increase further, and ‘The Hollywood model’ of **work on demand** will become ever more popular. Jobs will be broken into projects that may be outsourced to in-

dependent professionals or allocated to **temporarily hired** teams, physical or virtual. This approach to work may negatively impact the **social security system**, which was designed for workers with permanent contracts.

Social security systems and income distribution may undergo **reform** in order to ensure the continuation of the social and economic system.

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Blockchains and trust: a revolution, reformation or just another tech-toy?

By Freya Windle-Wehrle

Background

OECD [statistics](#) show a constant **decline in trust** in national governments since 2007. Recent scandals play their part. However, the issue goes much deeper when corruption and fraud govern. Then, societal perceptions change even faster in search of solutions to poverty, inequalities and vulnerabilities in infrastructure.

Here, the blockchain technology that undergirds crypto-currencies could have a far-reaching impact as it is a cheap, tamper-proof and data based technology that can **replace trust with transparency**. It is a breakthrough that will fundamentally change people's notions of centralised authority. Hence, zero-trust computing, digital public ledgers and self-executing smart contracts are emerging, blockchain-based trends that will be increasingly important in the coming [years](#) — by 2023 at the latest, according to the [World Economic Forum](#).

But how does a blockchain operate? Put simply, it is a **universal digital ledger** that functions by means of a public peer-to-peer network in a decentralised system such as [Bitcoin](#). Many other examples are emerging (e.g. [Ethereum](#)). The ledger **holds a record of every transaction made**,

and uses cryptography to verify them and keep information private. Using decentralised consensus, a blockchain eliminates the need for trust and keeps expenses low as verification processes become redundant. One of its great promises is that it can serve as a decentralised, permanent, unalterable store of all types of information or assets, not just as a currency or payment system.

Although blockchain-based enterprises still seem some way away, public ledgers relying upon this technology are already a reality. Ghana uses it to digitise land titles, thereby replacing unreliable or non-existent public registries. [Bit-land](#), a non-profit organisation, supports citizens in this process which decentralises and democratises by safeguarding property rights. The result is emancipation. [Honduras](#) and the Republic of Georgia are also in the forefront. In Honduras, the public sector has begun a project to reduce fraud in its land registry by moving data onto a tamper-proof digital ledger. The prototype makes alteration or deletion of stored information impossible. Early in 2016, [Georgia's](#) National Agency of Public Registry started a blockchain land titling project together with the Institute for Liberty and Democracy.

However, not only is it a quantum leap in land registries. [IBM](#) is experimenting with **digital consumables** marketplaces in a decentralised IoT (Internet of Things), where appliances of the future autonomously manage their consumables via blockchains. Having sufficient intelligence, they will engage in real-time negotiating, for example power usage to reduce costs, or requesting and paying for their maintenance. Supply chains will be turned inside out by this trend, also regarding methods of payment.

Blockchains will reduce the use of intermediaries between producers and consumers in most processes in financial services. This is a disruptive factor which can dramatically **overhaul the traditional banking system and industries** (e.g. insurances - [Everledger](#)). Protecting land titles and preventing property fraud is a major step forward in its own right. Opportunities also arise in the education sector: the [University of Nicosia](#) already issues academic certificates that can be verified through a blockchain. So, with a trustworthy record that anyone can inspect and no single user controls, is there still a need for trust?

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Key uncertainties

- **Regulation:** A regulatory framework for blockchains is lacking. However, it is still too early to create one as the full potential of the technology is unknown. Moreover, as warned against in a recent European Parliament resolution on virtual currencies (rapporteur: Jakob von Weizsäcker (S&D, Germany)), could too much regulation stifle innovation? And, at which level should a decentralised peer-to-peer system be regulated?
- **Registration authorities:** The combination of many processes and systems into one increases efficiency and reduces costs. Will this kill jobs?
- **Environment** and energy consumption: How much power does the network, do the networks consume? What are the costs?
- **Security and risks:** What if a blockchain is compromised or weaponised?
- **Ethics:** If everything is stored, what about the 'right to be forgotten'?

Possible disruptions

- A blockchain is a mundane process that has the **potential to revolutionise** how people, governments and businesses cooperate since it replaces the need for third-party institutions to provide trust for financial, contract and voting activities.
- Massive disruption is expected in the **banking sector** due to non-bank players in payment systems.
- Together with the IoT and Big Data, systems are becoming 'smart' and integrated. There is likely to be a significant **economic transformation** which will have major implications for how businesses are conducted in the future.
- Digital revolution **generates new jobs** such as blockchain developers, IoT architects and cognitive computing engineers. This deconstruction of work and labour reallocation in turn require an adapted approach to education and retraining of workers.
- Blockchains are potentially a serious **challenge to traditional power structures and centralised authority**, and in particular to administration, as the need for regulation remains. But they also represent an opportunity, for example with regard to new tax mechanisms.

Main Trends to 2030

Start-ups hope to capitalise on blockchain technology - either the Bitcoin blockchain or new ones such as Ethereum. Their applications run on custom-built blockchains that are backed by a shared global infrastructure. They are free of fraud, censorship or third-party interference.

Tracing product provenance along the value chain could lead to **more informed consumer decision-making**. Hence, a more transparent and safer market could emerge.

Industry leaders and banks are **customising and tailoring** the blockchain distributed ledger technology to fit very particular uses.

Blockchain algorithms will massively **replace traditional jobs** in areas such as accountancy, banking, translation and legal assistance, creating vacancies in the ICT sector (see the vignette on Jobless Growth).

There are likely to be radical effects on the IoT as **devices will perform**

autonomously ('Device Democracy') via blockchains in financial and non-financial settings.

Decentralised, autonomous organisations and marketplaces will emerge, consisting of virtual companies running on a **blockchain-based set of rules**.

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Additive Manufacturing in 2030: how the next Gutenberg revolution may bring production back to Europe

By Danièle Réchard with Arun Frey (Trainee)

Background

Additive Manufacturing (AM, also referred to as 3D printing) refers to the process by which three-dimensional products are built from the bottom up, **adding material layer-by-layer** on the basis of a digital file. Through this additive approach it is possible to manufacture complex shapes and intricate parts at near 100% material utilisation that could not have been made by traditional means.

Due to its flexibility, its potential to fundamentally alter the production cycle and to 'democratise manufacturing', some believe AM and 3D printing to be the precursor of an '**Industry 4.0**', a shift to a digitalised, automated and data-oriented manufacturing industry.

The technology's disruptive potential has caused both excitement and worry:

On the positive side, the potential of **bio-printing** could fundamentally revolutionise medicine by, for example, printing organs from patients' own cells, thereby alleviating current organ shortages.

On the negative side, the issue of **3D printed firearms** has raised security concerns about the adverse

implications of 'democratised manufacturing'.

According to [The Atlantic Council](#), 'AM is perhaps at the point of the earliest development of personal computers or at the beginnings of the Internet and the World Wide Web'.

Adoption of AM is growing at a rapid pace, and 3D printing has found a foothold in various diverse sectors, including in the areas of **medicine, food, prototyping, construction and robotics** among others.

Desktop-scaled 3D printers are becoming more affordable, fab-labs and digital fabrication workshops are emerging throughout Europe, and 3D printer sales are growing rapidly, indicating that the **onset of the 3D printing revolution is increasingly becoming a reality.**

In the seventh European Framework Programme (FP7), 'the EC funded more than [60 successful projects](#) in AM, with a total amount of EU contribution of over €160 million and a total budget of €225 million'.

Additive Manufacturing has become a research priority in Horizon 2020, identified as a **key enabling technology**.

Apparent growth in the area of additive manufacturing requires governmental action and policy response, from adjustments in intellectual property rights to consumer protection laws, without stifling future innovation.

According to the [European Commission](#), additive manufacturing technology is expected to generate US\$ 11 billion of revenues in 2020 in the EU alone. However, these numbers could be as high as US\$ 105 billion if **current barriers** to the industry's growth could be removed. AM maximises production flexibility, minimises the use of resources and the carbon footprint of manufacturing and increases local production, which in turn strengthens regional economies within the EU.

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Key uncertainties

- The degree to which mass adoption of 3D printing technologies will lead to high levels of **unemployment** is ambiguous. The WEF recognises that advances in AM would reduce the amount of labour needed in production, but these negative effects could be partially mitigated by the birth of a new industry supplying printing materials.
- To what extent will additive manufacturing **replace traditional methods** of production, which, as of now, still have considerably lower production costs?
- A positive scenario is a shift **from mass production**, where Europe is facing tough competition from developing countries, **to full customisation**, to keep the European economy competitive and at the forefront of innovation.
- That said, it could take years before the impact of 3D printing is felt beyond a limited range of goods.

Possible disruptions

- Large-scale restructuring of the current **manufacturing process may shift manufacturing back to Europe**. 3D printing could severely shorten the supply chain (with goods being printed on-demand), sparking localised and dynamic production.
- Additive Manufacturing could be a way to **increase productivity** in Europe despite a **decreasing workforce**.
- On the other hand, a reduced need for labour in industrial production could have a **destabilising effects** in some countries.
- Unprecedented advancements in bio-printing have the potential to significantly extend life expectancy. Would such technology be available for everyone, or would it further widen the health divide between rich and poor? Could the possibility to easily replace organs create disincentives to care about one's health?
- Will 3D printing really be a relief for the environment or will it simply lead an **explosive growth** in the consumption of **plastic goods**, potentially increasing the environmental burden?

Main Trends to 2030

By 2030 conventional **buying habits** will have changed considerably, with individuals printing their own products directly from their home. Buying goods in stores will change too, with a move away from mass produced to fully customised items.

The McKinsey Global Institute estimates **the economic impact** of 3D printing to lie between US\$ 230 billion and US\$ 550 billion per year by 2025.

Additive manufacturing will have an impact on the future labour market, potentially reducing the **labour costs** in some industrial sectors to almost zero and shifting manufacturing back to European countries.

Gains in 3D printing technology will also significantly spur innovations in other sciences, especially related to **nanotechnology and bioengineering**. Ongoing bio-printing using human tissue could revolutionise organ transplantation and potentially solve the

issue of organ shortages.

Although the '**democratisation of manufacturing**' will bring multiple benefits and spark innovation and entrepreneurial opportunities, it will also increase the risk of copyright infringements, and raise security concerns.

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Intolerance and hate crime: the return of an old problem?

By Eamonn Noonan

Background

Increased intolerance has long been identified as a worrying trend in foresight reports. For example, the [EUISS](#) stated that 'Migrants and ethnic minorities will become the main target of groups opposing cultural diversity, and are likely to be the victims of xenophobia in many developed countries'. The EUISS report framed it in the context of developments that were otherwise quite encouraging. It suggested that 'the decline of theories of conflict between civilisations and cultural relativism is therefore likely, although economic and social difficulties may reverse this positive trend in some countries, and extremist **identity politics and xenophobia** will continue to leave a mark on some parts of the world.' In a similar vein, the [Rand](#) report spoke of the possibility that the presence of ethnic minorities would be widely regarded as undesirable and divisive. More recently, the refugee crisis from 2015 prompted the [World Economic Forum](#) to note that 'insularity, xenophobia and right-wing populism are gaining ground across the continent, calling into question the integration process and a common European front on international security policies'.

A rise in intolerance, hate speech and hate crimes has been documented in parts of Europe in recent

years. In [Germany](#) alone, 1 031 incidents targeting accommodation centres for asylum seekers were recorded in 2015 — a five-fold increase on the previous year. 95 of these involved arson. In the [UK](#), the latest reported figures for hate crimes showed a year on year increase of 18%. Attacks on people choosing to follow religious dress codes by wearing a headscarf or a kippa are one aspect of this trend. Different tendencies are coming together: The European Commission against Racism and Intolerance ([ECRI](#)) expresses concern that the **Islamophobic trend** has merged with growing **anti-immigrant sentiment**, due to the influx of large numbers of migrants from Muslim-majority countries. Other background factors linked to this increase include terror attacks and the arrival of large numbers of refugees and economic migrants. **Austerity** is also associated with increased intolerance. As ECRI notes, the rise of right wing extremism, embracing xenophobia, anti-Semitism and Islamophobia, is another contributing factor.

The vigour with which authorities and public opinion respond to intolerance and hate crime can vary. [Amnesty International](#) has recently criticised a tendency to **fail to adequately investigate** and pursue hate crimes. Yet official responses should not be limited to

punitive measures; there must also be ample room for **rehabilitation**. The [International Network for Hate Studies](#) stresses the importance of alternative ways to address hate crime, including restorative justice approaches. Considerable efforts are underway to help [draw young people away](#) from extremist groups, and this must also be pursued.

There is also a problem of **under-reporting** of hate crimes and discrimination, which itself can be a signal of lack of trust in the authorities among minority groups. Funding cuts for services to combat racism and intolerance make it harder to raise awareness of the problem. On the other hand, **advances in technology** make it easier to track violent incidents, and smartphone recordings have often proved crucial in bringing perpetrators to justice. It seems likely that greater awareness of the extent of hate crime and of the societal costs of intolerance would prompt firmer responses by the authorities.

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Key uncertainties

- Will the growth of hard-line nationalist political parties **translate into sectarian and discriminatory policies**? If support for extremist parties declines, or if radical groups moderate their rhetoric as they gain political office, this risk will be reduced. This is a dangerous assumption; European history provides notorious examples to the contrary.
- Will intemperate commentary through social media lead to an **increase in racist attacks**? There are some indications that racist comment creates a climate favourable to violence. The possibility of a causal link between these phenomena, beyond mere correlation, deserves attention. This has implications for strategies to combat online hate speech.
- New **channels for dissemination of racist content** are likely to emerge, and this will call for vigilant preventive strategies.

Possible disruptions

- **Self-segregation** among minorities could result in higher levels of intolerance. Some within minority communities urge disengagement from the host society; some Muslim communities have been targeted by ideologues agitating for the replacement of democracy with theocracy.
- **Ghettoisation** on identity lines, whether imposed by the majority or embraced by the minority, would likely provoke increased intolerance and social conflict. This has implications both for urban planning and for policies towards segregated education.
- **Economic recession** is a potential obstacle to progress, given the association of poor economic performance and intolerance. Absence of economic recovery and labour market stagnation could well lead to systematic disparities by subgroup on income, employment, health and educational achievement. This scenario would create favourable conditions for radicalisation among minority youth and a possible pattern of reciprocal violence.

Main Trends to 2030

History has many examples of **integration improving with successive generations**. This is also a possible outcome in twenty-first century Europe. An alternative, negative scenario, however, is a persistence of hatred and division, accompanied by increased levels of hate crime. Policy decisions will influence matters: inaction could permit a downward spiral of hostility and division.

Europe has the advantage of a **strong legal basis** for combatting all forms of

discrimination. It helps that respect for human rights is a core European value. An energetic civil society is hard at work to promote tolerance and cross-community relations. These factors are likely to move developments towards the more favourable scenario.

It remains important to **grasp the seriousness** of the problem, and its potential to create deep and lasting conflicts if not tackled. Signs that progress is being made would include

an improvement in mechanisms to monitor hate crime and hate speech, and in mechanisms to intervene rapidly where problems emerge.

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The mobile internet and democracy: less citizen empowerment than we thought?

By Eamonn Noonan

Background

Real-time communications via internet and large-scale participation in social media can for the purposes of convenience be referred to as the '**mobile internet**'. This is a relatively recent phenomenon, but it has already shown its **potential to impact political affairs**. The Arab Spring, the Umbrella movement in Hong Kong, and the emergence of new political parties in Europe, all owe a great deal to the emergence of new, internet-based channels for communication and networking.

What impact will the mobile internet have in the coming years? One scenario is of **greater participation** in debate and in elections; another is of knee-jerk responses crowding out more deliberative and strategic policy-making. Some emphasise the prospect of **individual empowerment**, while others worry about a dumbing-down of the political process. A more fundamental question is whether the balance of power will ultimately shift towards, rather than away from, incumbents, who tend to have greater capacity to store and analyse user data.

There is consensus on the need to **combat hate speech** in social media, to say nothing of the use of the internet to promote violent

extremism. Yet a balance must be struck that preserves freedom of expression. Overregulation, or the wholesale criminalisation of dissenting opinion, would be negative developments. A related concern is that sophisticated data analysis tools may allow **manipulation of public opinion**. New technology brings opportunities for citizen empowerment, but it also increases the vulnerability of individuals to intrusive surveillance.

The mobile internet affects the relative power of incumbent **political parties**. New parties have used social media effectively to overcome lack of access to mainstream media, especially since **younger voters increasingly rely on new media** rather than traditional news sources, including television. Yet the conclusion that new media make it easier for new parties to emerge is an over-simplification. Groups that integrate new media into their election strategy campaigns seem to gain at the expense of those which stick to traditional, top-down approaches. But established parties that engage seriously with new media can prosper; an example is the targeted ground game of the Obama campaigns in 2008 and 2012. Indeed, the large scale **commercial harvesting of data** on individual preferences favours a commodifi-

cation of politics that could shrink, rather than enlarge, the public sphere. The political landscape of Europe differs greatly from that of the US. It is more multifaceted, and does not have the duopoly of large parties that characterises the latter. This may give greater scope for the emergence of technologically innovative new actors, such as The Five Star Movement (M5S) in Italy and Podemos in Spain. Yet a trend for established large parties to lose ground in Europe has been apparent for some time: the mobile internet may have encouraged this development, but it did not cause it.

The use of the mobile internet to open up **policy making and nomination processes** has the potential to lessen the gap between decision-makers and the people. Several parties are innovating in this direction, including Partido de la Red, Argentina, D66 and the Labour Party in the Netherlands and the Liberal Alliance in Denmark, as well as M5S and Podemos referred to above.

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Key uncertainties

- Greater citizen engagement means greater insistence on **transparency and accountability**, and this makes it more difficult to keep bad behaviour and sharp practice out of the public eye.
- Some argue that 'Brexit represents the first major casualty of the ascent of digital democracy over representative democracy,' and that digital democracy has contributed to **polarisation, misinformation and stasis**.
- Social media has the capacity to **magnify individual incidents** and create pressure for immediate responses to complex challenges.
- The public interest is not always served if **short-term fixes** are preferred to long-term planning, in areas where carefully designed policy packages, with a payoff over years rather than weeks, are the key to progress.

Possible disruptions

- Cybersecurity is a core issue. Large-scale theft of personal data is occasionally reported, but this has not slowed the progress of online services. Credible evidence of manipulation of electronic voting machines after a closely fought election could change this. So could a major incident involving loss of life, for example related to hacking of transportation systems.
- Successful management of **security threats** is essential for continued public trust in the internet.
- The **fragmentation of the internet** from a unified global system to a number of rival systems is another risk factor. Whether this occurred as an incidental result of technological innovations or because of deliberate policy decisions, it would have major implications, not only for economic development, but also for relations across the Atlantic.
- Mismanagement of the issue of **privacy versus surveillance** would compromise the potential of the mobile internet to promote democratic participation and empowerment.

Main Trends to 2030

The mobile internet may well enhance the present trend in Europe in favour of '**issue-based**' **political initiatives**, and thus create further challenges for long established 'big-tent' parties. The political landscape would see more fragmentation.

New media afford new opportunities to promote and coordinate grass roots input, and to challenge top-down, centrally controlled processes. The mobile internet could influence levels of trust between rulers and the

ruled, which have declined in particular since the 2008 financial crash.

Trust might increase if governments chose to play a more modest role in certain areas, in order to allow the engaged citizen greater room to generate solutions.

If one accepts the view that the internet is an intensifier rather than a determinant of trends, the key driver will be the extent to which current **economic challenges** are overcome.

A return of economic prosperity would likely encourage positive scenarios of constructive citizen engagement; continued economic stagnation would make for greater polarisation and fragmentation.

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Russia and China in 2030: authoritarian alliance or geopolitical rivals?

By Leopold Schmertzling

Background

The 2008-2009 financial crisis accelerated the planned **phasing-out of China's export-oriented high-growth** period. Since then, the Chinese government has had two overarching goals: delicately reforming the economy while at the same time preserving political, social and economic stability.

One way for the Chinese government to achieve stability is to focus on the international sphere. It has stirred up national sentiments about old but popular **foreign policy grievances**, especially its difficult relations with Japan and Taiwan, and the question of who rules the East and South China Seas. In addition, it has stepped up its efforts to achieve **global economic expansion**, with the One Belt, One Road initiative. Thirdly, it has started to build a system of organisations (e.g. the Asian Infrastructure Investment Bank) or strengthen existing ones (BRICS, Shanghai Cooperation Organization - SCO) that work in parallel to the established western institutional architecture, in order to advance **global multipolarity**.

This is where – from the Chinese point of view – **Russia** comes in. For China, Russia could be a **junior partner** in international politics: helping

to divert US attention (e.g. from the South China Sea back to Europe) and to complement China in areas where it is less competent, i.e. modern weaponry and projecting international influence (e.g. Europe, MENA region). In the economic sphere, Russia can serve as a key supplier of energy and as a market for Chinese companies. Russian gas decreases pollution through coal and is secure in its supply and is therefore of key importance to China. Regarding the multipolar global order, Russia is already cooperating with China in most non-western institutions, for example BRICS and SCO.

Russia, after losing its role as the co-decider of world affairs in the 1990s, **slowly regained** what it saw as necessary control over its sphere of influence, financed mainly by high oil and gas revenues. For a decade now, Russia has acted militarily to counter what it sees as western interference, which includes democratic reforms in its neighbourhood. The current western sanctions have hurt the Russian economy, which is already under pressure due to the low oil price, the long-term effects of the financial crisis, an uncompetitive economy, chronic mismanagement and corruption.

As for China, Russia's top priority

is regime survival, but in contrast to China, it has not yet started to diversify its economy, in this case away from energy, to sustain long-term growth. Its apparent aim is to stay economically and politically stable in the short-run, in the hope for a **medium term rise in energy prices**.

For Russia, China is the centre piece of its 'pivot to Asia' and **a lifeline that will keep Putin's system going**. In 2009, China provided Russia's oil companies with US\$ 25 billion to survive the financial crisis. Simultaneously, it opened its financial hubs, like Hong Kong, to Russian firms. In 2015, the two countries negotiated a 30-year energy contract worth US\$ 400 billion that seems to be profitable for both sides. There are questions regarding the economic viability of some of these projects. But Russia highlights progress as signalling to the West that sanctioning its economy, and encroaching on its sphere of influence, could come at the cost of assisting China's rise. Finally, Russia hopes to find in China a partner to work with on the international stage, stabilising Central Asia, securing friendly regimes and building an anti-western sphere of stability.

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Key uncertainties

- The extent to which Russia's and China's recent **assertive behaviour reflects strength or weakness** is unclear. This makes estimating future behaviour highly uncertain.
- **Russia and China share a long history of cooperation and rivalry.** It was weakness that made Russia accept Chinese influence in areas of common interest and that started a rapprochement. Any change in international, regional (e.g. Japan, Iran, India) and the respective national arenas, could upset this relationship again.
- **Russia's aggressive foreign policy endeavours might endanger the future partnership with China.** Neither the willingness of China to support Russia in this, nor the level of Chinese leverage over Russian foreign policy, is clear.
- China and Russia may attach **greater importance to their relations with the US and the EU** respectively than a possible alliance between the two countries.

Possible Disruptions

A 'soft alliance' could fail due to opposing interests:

- Russia's repeated use of its minorities as a foreign policy tool, contrary to the Chinese notion of non-interference and state-sovereignty;
- leadership shuffles and political interference by China or Russia in Central Asian countries;
- a nationalistic eruption of hostilities in Russia due to increasing Chinese influence in its sphere of influence or its thinly populated Far East (especially through cheap and efficient Chinese workers and companies);
- Chinese-caused instability in the East China Sea or Russian arms sales to Vietnam or other rivals of China in the South China Sea;
- differences of opinion on the future path of the collectively founded Shanghai Cooperation Organization (SCO) as an economic or security organisation,
- competition between the Eurasian Economic Union and the One Road One Belt initiative for influence in Eurasia;
- personal animosities.

Main Trends to 2030

The relationship between China and Russia is likely to become stronger and Moscow's dependency on Beijing will grow: **Russia will be the junior partner.** If Russia can cope with the limitations of this position, it could benefit from such a role.

A stronger long-term future partnership would mean that every problem any actor has with Russia or China would cause **repercussions** with regard to the other. Global and regional players will be forced to adapt to this.

Russia will be economically dependent both on China and the EU. Its manoeuvrability will be limited due to the terms of the energy contracts and the resources it has invested.

There will probably be closer **defence cooperation between China and Russia**, with large-scale joint military coordination and increased Russian arms exports to China.

In the long run, China will likely succeed in transforming into a

knowledge and service economy, while most analysts are unsure about Russia's prospects, due to the failure of the current Russian regime to modernise and diversify the economy.

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Democracy in the Middle East and North Africa in 2030

By Leopold Schmertzling

Background

The Middle East and North Africa, or MENA region is a contested regional concept. Sometimes also called the West Asia, North Africa (WANA) region, it has **no commonly accepted boundaries**, but a long common political and cultural history, mainly based on the Arab and Muslim identity of most of its citizens. Around a fifth of [Muslims worldwide](#) live in this region, but it also encompasses non-majority Muslim Israel, as well as many religious, ethnic and linguistic minorities. The definition used here includes countries on the North African coast and the Middle East, from Morocco to Iraq.

The two most important events affecting the evolution of democracy in the region in the last two decades were the **US Global War on Terror**, especially the Iraq War, and the so-called **Arab Spring in 2011**. Both led to major transformations in the region, which is now in turmoil: violent repression of legitimate protest and regional antagonisms have led to civil wars with over [15 million refugees](#); the securitisation of domestic politics, whereby 'normal' policy issues are treated as security threats, has put a stop to reform movements; and the low oil price and economic stagnation have further destabilised the region.

Although it is hard to rate [democra-](#)

[cy](#) (or [governance](#)), the NGO Freedom House [concludes](#) that, in 2016, ratings for the MENA region are among the worst in the world. Only two countries in the MENA region are considered to be **full democracies**: [Tunisia](#), with 79 points out of 100, and Israel (80 points). While Israel is a long-standing democracy, Tunisia has only recently taken key steps toward democratic rule since its Jasmine Revolution (as part of the Arab Spring). It adopted a new constitution and held national elections in 2014 and has so far avoided chaos and a return to authoritarianism.

The **three partly free states** in the region, according to Freedom House, are [Lebanon](#) (43 points), Morocco (41 points) and [Kuwait](#) (36 points). Lebanon has been plagued by insecurity for the last 40 years, but important aspects of democracy have nevertheless survived since the end of the civil war in 1990. Arab Spring protests in [Kuwait](#) and [Morocco](#) (as well as [Jordan](#) and [Oman](#)) throughout 2011 were met by both reform and limited repression from the respective monarchs.

The rest falls under the threshold of **not free**, (from high to low score: Jordan, Algeria, West Bank, Egypt, Iraq, Qatar, Oman, United Arab Emirates, Bahrain, Gaza, Saudi Arabia). Of these, three are currently **theatres of civil and regional war**

(Syria, Yemen, [Libya](#)).

This recent history of the area is entangled with long-term global and regional trends:

- Globally, there have been **ten consecutive years of 'decline of global freedom'** according to the Freedom House '[Freedom in the world 2016](#)' report. Over the past 10 years, 105 countries have seen a net decline, and only 61 have experienced a net improvement.
- In addition, according to the EUISS, the **Arab Muslim world is going through a political identity crisis**: Three currents of political Islam - electoral Islamism (e.g. Muslim Brotherhood), authoritarian Islamism (e.g. Saudi Arabia), and revolutionary Islamism (e.g. ISIS) - are dominating an often violent conflict, while other forms of political participation and ideology seem to be on the wane.
- The term '**democracy**' evokes **many contradictory reactions in the region**. It is associated with perceived western hypocrisy, especially in relation to the Israeli-Palestinian conflict and the failure of the so-called Arab Spring, as well as controversial historical concepts, such as colonialism, westernisation and nationalism. This makes any discussion of democracy prone to misunderstandings.

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Key uncertainties

- The most important uncertainty is whether long-term policies to **combat rising youth unemployment** (2014 MENA average: 28%) will work or not. Continuously high unemployment, especially among university graduates, might foster radicalisation, terrorism and criminality, but also renewed legitimate political resistance and emigration.
- The **success or failure of democratic Tunisia** will influence neighbouring countries such as Egypt and Algeria. The stable transformation of Ennahda into a democratic conservative party might change electoral Islamism and make it a dominant force in the whole region.
- Similarly, the democratic development in **Egypt, Turkey and Iran** will be of the utmost importance. Authoritarian or democratic change will influence the whole MENA region, but especially Tunisia, Libya, Lebanon and Iraq.
- Other important uncertainties will be the future trajectories, in terms of engagement and power, of the **US, the EU and China**.

Possible Disruptions

- A new form of **Islamic or Arab-nationalist interpretation** (or theory of) democracy could divert the strong forces acting inside jihadism away from fighting and could reawaken the progressive political will of the so-called MENA 'youth bulge'. A new charismatic leader or a new school of thought could provide the source for such an ideology.
- **Instability in Saudi Arabia** due to internal power struggles and the low oil price could lead to a revolution or a civil war, redrawing the political map of the Arabian Peninsula. Equally devastating would be an **open war between Saudi Arabia and Iran**.
- **Other possible events** with potentially widespread effect might include large-scale attacks on tourists in Tunisia or Egypt, a significant increase in food prices, the failure of the Iran nuclear deal, the mutation of ISIS and al-Qaeda into new organisations with mainstream appeal, the collapse of the Assad regime and the reform of the Arab League.

Main Trends to 2030

The **population** in the MENA region will grow from 357 million in 2015 to 468 million in 2025; Egypt grows by nearly a million people every six months. A large part of the population in 2030 will be young people between 15 and 30 years of age. Over 60% of the population will live in cities and will be confronted by the effects of **climate change**.

This **fast growing young population will be more literate and more connected**. Although 90% of the young can read and write, there are huge

discrepancies in education between different MENA countries, and between men and women, which will not change before 2030. From very low levels, internet penetration will double, from 25% to around 50% in 2025. Most of these future users are young and educated, providing possibilities for a vibrant social and political sphere online.

Even if oil prices stay low, Asian energy demand will sustain Arab regimes, their **wealth distribution** and their rentier economies until 2030, dis-

couraging and weakening democratic forces.

The MENA region will also suffer from **persistent gender inequality**, although there is a rise in women's political participation, especially in parliaments, and improvements in their economic participation.

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This is a publication of the Global Trends Unit
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European Parliament

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PE 573.301

ISBN 978-92-846-0104-2

doi:10.2861/653859

QA-06-16-063-EN-N

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