



Miscellaneous

These blogs cover a range of different topics, including reviews and more general futures thinking.

Why we are optimists- 2022



Image by Gerd Altmann from Pixabay

It has been a rough year. We'd like to brighten up your thoughts by sharing a few things that make us optimistic, from 2022.

Most important is that the serious financial media are saying that renewable electricity is cheaper than fossil fuels electricity. While replacing the old infrastructure which delivers electricity generated by fossil fuels is the hurdle, and while the switch may be too little too late to halt global warming, it is a start.

The argument has gone from "is a switch to renewables the right thing to do?" to "how much will it cost?".

The most recently published World Energy Outlook found that global fossil fuel combustion CO₂ emissions rose by just under 1% this year. This was due to growth in renewable energy and electric vehicles. In 2021, post pandemic, the increase was much larger. Solar and wind



are replacing much of the gas withheld by Russia, “with the uptick in coal appearing to be relatively small and temporary,” says Fatih Birol head of IEA.

Our World in Data identifies 26 countries including China, that not only pulled off the emissions drop, but grew their economies simultaneously.

For the first time, the IEA says global fossil fuel use could peak over the next decade thanks to stronger global emissions policies. We would add “and relative price changes”.

On other topics:

Despite the pandemic, the global economy has not collapsed, we survived and medicine has made advances in vaccines that would not have happened otherwise. The American government has maintained the ability of citizens to vote, to criticize the government, and to change unjust laws. And “we are not living through World War III”.

Another threat to humanity is bio-degradation. In *New Shoots* we discussed a number of snapshots of people acting to reverse the biodegradation of our planet. On 19 December 2022, during Cop15, a historic deal was struck to halt biodiversity loss by 2030. Indonesia plans to protect 10% of its seas by 2030, and 30% by 2045. The Global Mangrove Alliance has reported a decline in the overall rate of mangrove loss. More than 42% of the world’s mangroves are now protected, an increase of 17% since 2012.

The Sea Women of Melanesia has more than 40 members and protects 43 marine areas. “It is a team of women who are passionate about marine conservation and who are willing to go back to their community to set up marine reserves”, says team leader Naomi Longa. Local women learn essential skills such as snorkeling and underwater photography, and take classes in marine science. They help monitor the health of coral reefs in protected marine areas and assess the effects of coral bleaching on underwater life.

Langholm in Scotland was in decline as mills closed and the local landowner reduced his estate shooting business. The community bought some of his land and created the Tarras Valley Nature Reserve, to regenerate the community and the land, via ecotourism, environmental study centres and landscape restoration.

Zimbabwe’s Mana Pools, one of Africa’s most renowned game-viewing destinations, has maintained a zero elephant poaching rate for the third year in a row – a staggering achievement given 12,000 were poached in the area in the past ten years. More funding for local rangers along with the introduction of tracking technology and smartphones has driven the change.

Children in Brazil are breeding mosquitoes at home as part of a life-saving health initiative. These mosquitos are infected with Wolbachia bacteria under a pioneering initiative from the World Mosquito Program. Wolbachia cripples the insects’ ability to transmit blood-borne



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viruses like dengue, Zika, chikungunya and yellow fever. It is spread by releasing captive mosquitoes to breed with wild populations.

We hope these examples help you discover some optimism too.

Written by Patricia Lustig, SAMI Principal and Gill Ringland, SAMI Emeritus Fellow. A longer version of this blog was first published as a Z/Yen Long Finance Pamphleteers on 20 December 2022.

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Cut+Paste at The Crick Institute

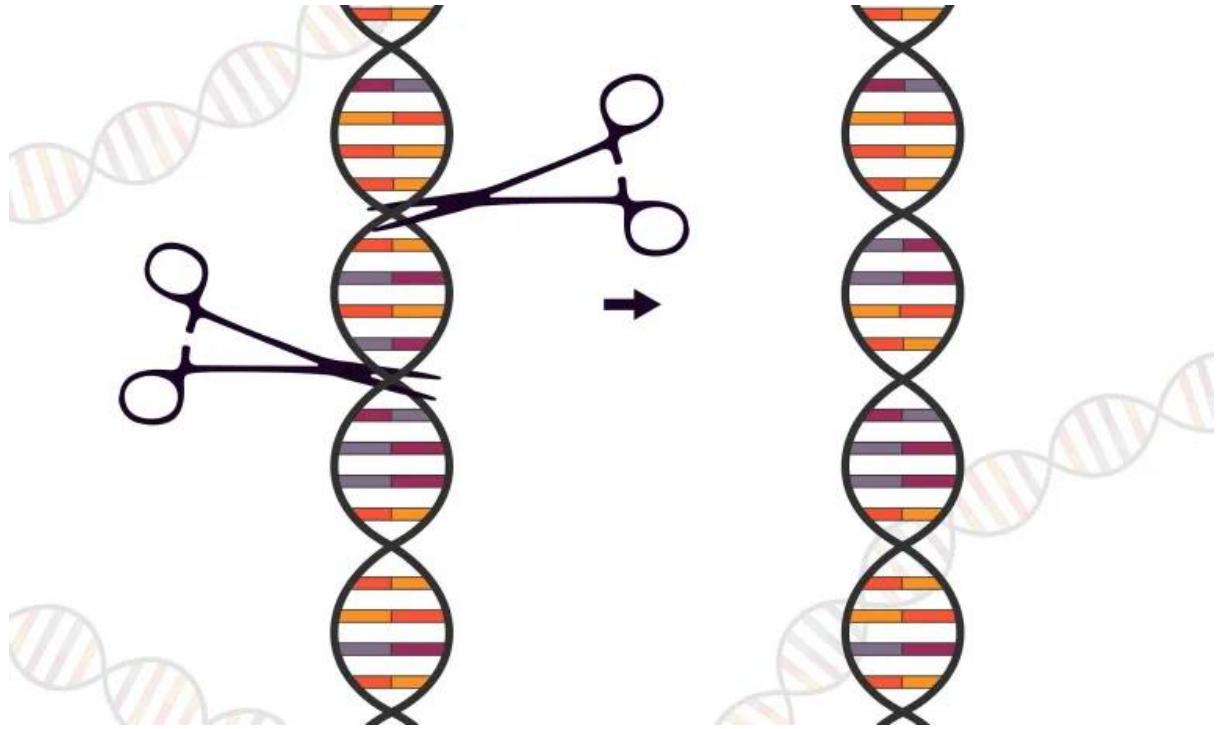
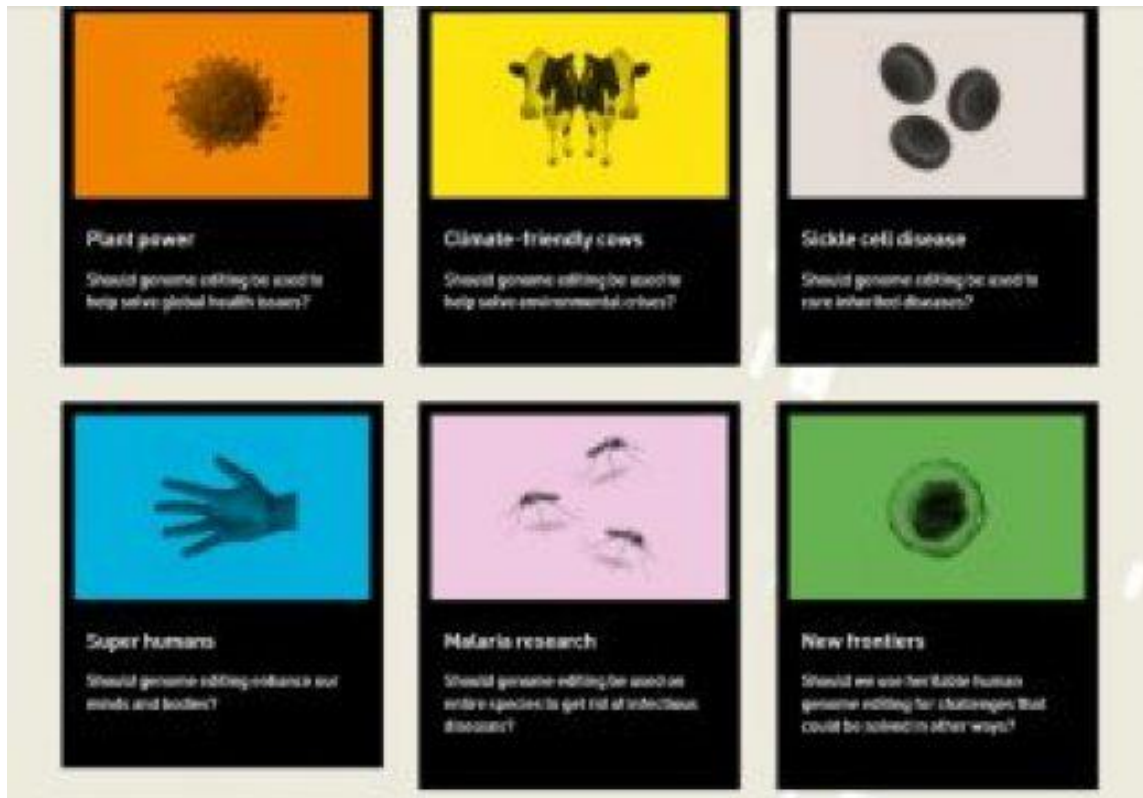


Image by LJNovaScotia from Pixabay

We have had Biotechnology as one of SAMI's main global Drivers of Change for many years. The invention of the genome editing tool CRISPR/Cas-9, which won its inventors the Nobel prize in 2020, has super-charged the field, with myriad applications in food and agriculture, and medicine. But this headlong rush into innovations has started to raise ethical and regulatory questions, just as Genetically Modified Organisms did some years ago. Currently the EU classifies genome-editing in the same way as GM, whereas the UK – in a Brexit departure – has chosen not to.

Regulators will need to get to grips with the issue. Experience has shown, though, that the general public also has a view on the ethics of the whole thing and needs opportunities to both hone and express that view. A new exhibition at the Crick Institute, Cut+Paste, aims to move this discussion along. Helpfully, it also has an online version that includes the same content as the in-person one.

The exhibition aims to collect views on 6 major applications of genome editing.



But rather than dive straight in, the exhibition takes the visitor through a briefing on the science and some questions. These are not just informative and educational, but also engaging and stimulating, asking people to think about the issues from a personal perspective.

The exhibition opens with the provocative question “genome editing has the power to shape the future – whose vision should it be?”, elegantly drawing the visitor in. It’s a pertinent question too in the light of the fact that five agricultural biotechnology corporations controlled most of the technology needed to develop GM crops, as well as the tissue from which new plants can be grown, for example seeds, plants or leaves.

The second section is a briefing on DNA and the way CRISPR is used to “cut and paste” genes to treat diseases such as cystic fibrosis and develop new ways to fight malaria by editing mosquito genomes. Then visitors are asked which tastes, traits and talents they would like to pass on – love of animals, sense of humour, musicality. While not all of these are driven primarily by genes, their inclusion is a further clever way of widening the appeal.

More interestingly, CRISPR’s applications in treatments of conditions caused by variants in specific single genes are discussed: sickle cell disease and haemophilia B, some inherited forms of sight loss, leukaemia and several other cancers. Although heritable genome editing affecting succeeding generations is not legal in the UK, prospective parents can already examine IVF embryos for ones that have genes signalling disease and implant only those that do not.



This leads the exhibition on to enhancement and “designer babies”. Again, this is currently not legal – and largely not yet technically feasible. This may be most people’s red line. But we do all “enhance” ourselves to some degree: whether it is through education, using drugs such as caffeine to increase alertness, wearing make-up, working out, or cosmetic surgery.

Finally, the visitor is invited to consider the six ethical questions and submit their views.

Should genome editing be used to help solve global health issues?

On the one hand genome edited crops can help prevent diseases, reduce the need for farmed salmon and increase agricultural productivity. On the other it does nothing to address poor diets generally or favour sustainable farming. Genome editing could have many different unintended consequences.

Should genome editing be used to help solve environmental crises, eg with climate-friendly cows?

Farm animals produce around 14.5% of all greenhouse gas emissions. Selective breeding does similar things less effectively, so why not engineer cows that do not emit methane? And we could create drought- or disease-tolerant animals and plants. Alternatively, we could all eat less meat and dairy, and use land for plants and carbon capture more effectively.

Should genome editing be used to cure inherited diseases?

Sickle cell disease is just one of a large number of diseases that could be treated by somatic (non-inheritable) genome editing, improving the quality of life for many. However, it is very expensive and not easily available to the 200,000 to 300,000 children born with the disease in Africa each year.

Should genome editing enhance our minds and bodies?

Gene editing could be used to protect astronauts on flights to Mars from radiation and other hazards. And if drought-tolerant cattle are acceptable, why not drought-tolerant people? What is the line between preventing dementia and improving mental capacity? Using such expensive treatments to give some people greater advantages again increases inequality.

Should genome editing be used on entire species to get rid of infectious diseases?



Gene editing could be used to eliminate certain types of mosquito that carry malaria, saving millions of lives. But what might be the unintended consequences of removing part of the eco-system?

Should we use heritable human genome editing for challenges that could be solved in other ways?

Up until now the exhibition has been very evenly balanced, but here the question as phrased seems to me to be rather loaded. I imagine most people would say that if we could achieve the effect without heritable genome editing then we should. But what if this is the only way known? Would it not then be right to prevent future generations having to live with life-afflicting conditions such as deafness? Disability rights campaigners might argue that we should instead treat the disabled better, but we could do both. Potentially genome editing could move us back into the territory of eugenics and conversion therapy. And as always there could be unintended consequences, and we are in effect treating (unborn) people without their permission. It might mean long-term monitoring of future generations of DNA-edited individuals in case medical problems appear down the line, which would be costly, but mean that innovations could be introduced gradually.

I saw the online version of the exhibition. I thought that overall it is thought-provoking and challenging, and performs the valuable role of allowing people to express an opinion. Of course, those viewing online or attending in person will be a self-selecting group and the results can hardly be taken as representative of the population as a whole. Why not go and have a look and contribute yourself?

The exhibition does quite a good job of thinking through second and third order effects – a valuable futures thinking approach. The arguments about increasing inequalities could be applied to many other areas of medicine, especially as we move towards more personalised treatments. Similarly, arguments about “unintended consequences” could be applied to all scientific advances, admittedly sometimes correctly as with man-made global warming. Tampering with eco-systems is risky; but we have eliminated smallpox and almost eradicated polio – why shouldn’t we use whatever we can to get rid of malaria?

Biotechnology is advancing on many fronts. CRISPR is becoming ever-more powerful with techniques such as prime editing and smaller versions of Cas-9 that can be transported by popular genome therapy vectors to address an even wider range of diseases. Epigenome editing could be even more versatile, in effect dialling a gene’s impact up or down, rather than just switching it on or off.

Away from gene editing, there are advances in laboratory grown meat – already selling well in Singapore. Human organs suitable for transplants can be grown outside the body. Genetically engineered yeasts and bacteria have long been used to produce human insulin.



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The Crick Institute's work in engaging the public is valuable. It points up a number of important questions and reinforces our view about the transformative potential of the technology. Biotechnology will remain one of SAMI's Drivers of Change across a wide range of potential futures.

Written by Huw Williams, SAMI Principal

Published 23 February 2023



World Values Survey



Image by John Hain from Pixabay

When exploring major drivers of future change, the focus all too frequently is on technological innovations or short-term political tensions. But both the adoption of technology and pressures on governments are fundamentally driven by social attitudes, which are often overlooked. Now, the latest wave of results from the [World Values Survey](#) (WVS), which has just been released, gives us insights into how attitudes have changed around the world since the survey began in 1981.

WVS is an international research program devoted to the scientific and academic study of social, political, economic, religious and cultural values of people in the world. It is a representative comparative social survey conducted globally every 5 years, covering 120 countries representing 94.5% global population. In the UK, it is funded by the [Economic and Social Research Council](#) and led by the [Policy Institute](#) at King's College, London.

The WVS suggests (referencing political scientists Ronald Inglehart and Christian Welzel) that much of the variation in human values between societies boils down to two broad dimensions:

- **“traditional vs. secular-rational values”** where traditional values emphasise religiosity, national pride, respect for authority, obedience and marriage, while secular-rational values are the opposite.

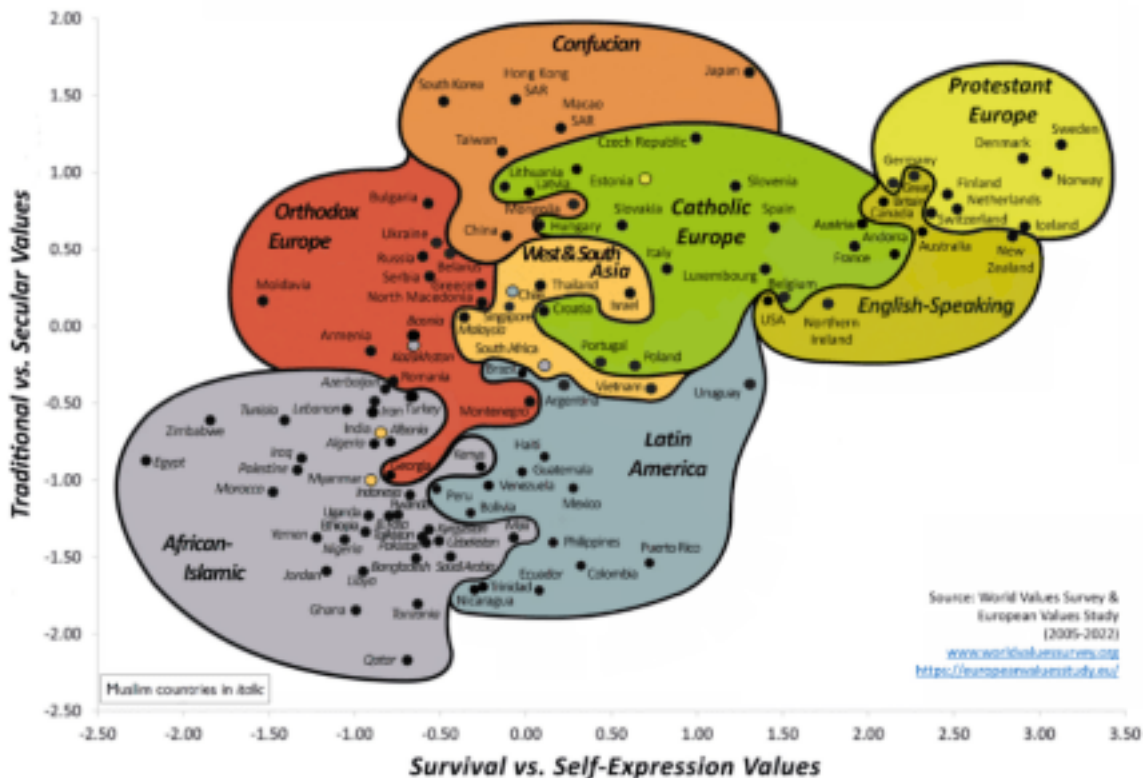


- **“survival vs. self-expression values”**. Survival values prioritise security over liberty, non-acceptance of homosexuality and sexual diversity, abstinence from political action, distrust in outsiders and a weak sense of happiness. Self-expression values imply the opposite.

The theory is that people’s priorities shift from traditional to secular-rational values as their *sense of existential security* increases and vice versa. This occurs most with the *transition from agrarian to industrial societies*. Shifts from survival to self-expression occur with an increase of *sense of individual agency*, mainly driven by the *transition from industrial to knowledge societies*.

Remarkably, WVS were able to produce a map of countries’ positions on these scales, which show significant geographical groupings (*Wave 7 report 2023*). (Note their own value judgements are shown by the direction of the positive/negative on the axes). Perhaps unsurprisingly, the Nordic countries were the highest scoring on both dimensions, with New Zealand and the Netherlands close behind.

The Inglehart-Welzel World Cultural Map 2023



THE INGLEHART-WELZEL WORLD CULTURAL MAP – WORLD VALUES SURVEY 7 (2023)
Looking at Qatar’s position on the map in relation to Great Britain’s perhaps indicates why holding the World Cup there received such criticism here in the UK.

Even more interesting is examining changes over time. WVS has produced an amazing animation of the results of the seven waves of surveys since 1981 – World Values Survey



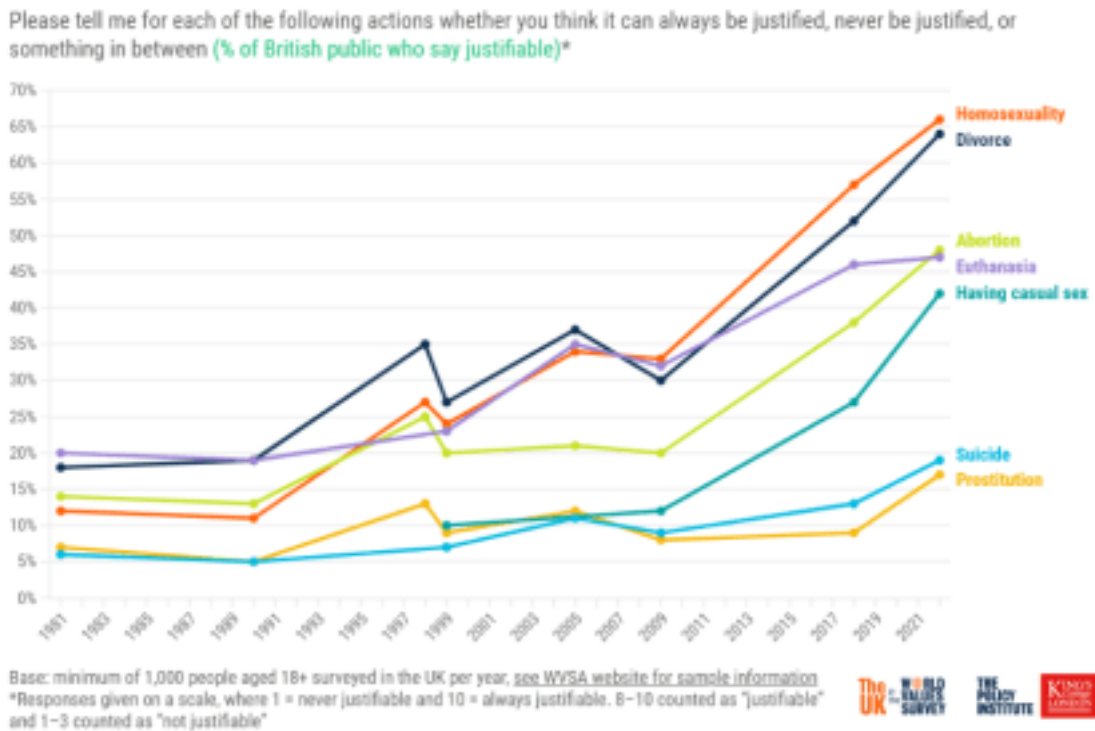
Cultural Map – YouTube. It is fascinating to note the ebb and flow of the positions of the UK and US.

This calls to mind work that SAMI did with the EC Research and Innovation Directorate, where experts plotted the paths of various regions across a scenario cross as they were impacted by different trends and shocks over time.

The most dramatic cultural change has been the shift toward gender equality. Whether men make better political leaders than women is a major belief within the “survival versus self-expression” dimension. Globally, a majority believes that men make better political leaders than women; however, this view is rejected by growing majorities in post-industrial societies and is overwhelmingly rejected by the younger generation within these societies.

The UK has become more liberal over the period, though the proportion of people saying suicide and prostitution are justifiable is still below 20%.

← → Across a range of issues, the British public have become much more socially liberal over the last 41 years
1 of 9



POLICY INSTITUTE ANALYSIS

This isn't just driven by younger generations replacing older generations. All generations have changed their views significantly.

The FT used the data to identify changing views to employing immigrants.

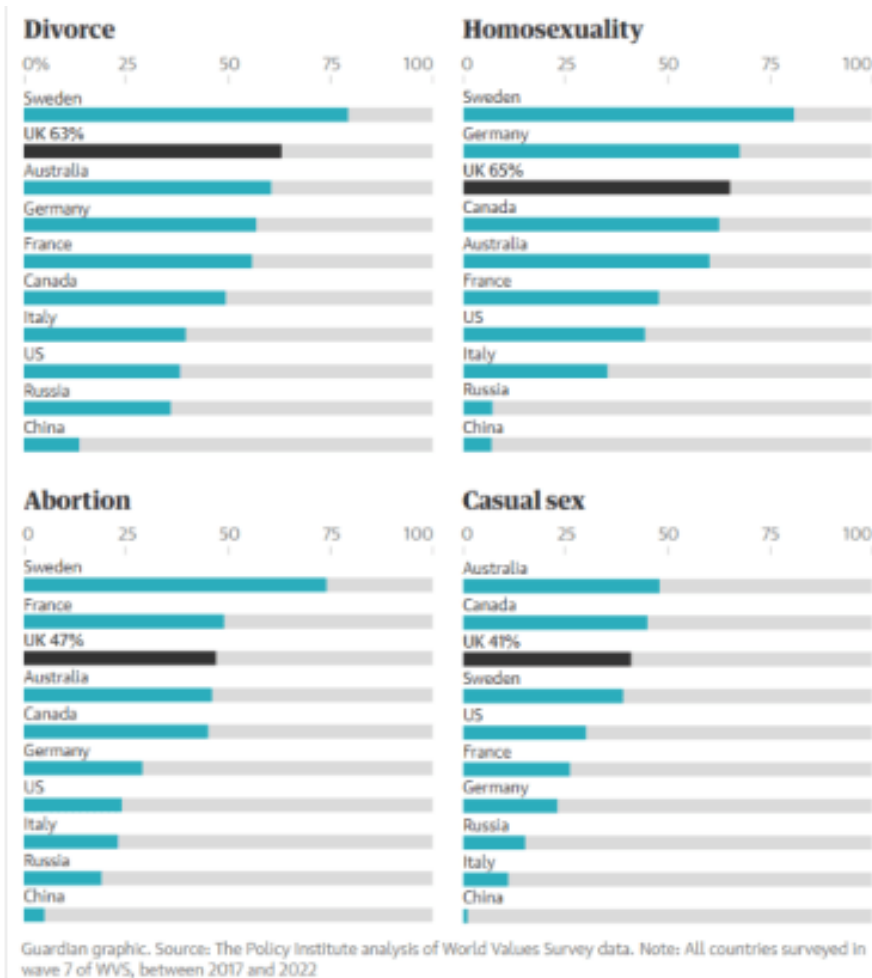


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The Guardian highlighted a comparison of the UK with other countries on a range of issues, showing it is among the most liberal.



However, UK attitudes are relatively less liberal on the death penalty, as the country has a more favourable view of capital punishment than various comparable nations. 21% think capital punishment is justifiable – higher than Greece (4%), Italy (6%), Germany (7%) and Spain (17%), though lower than Australia (25%), France (25%) and the US (30%). And a further 35% of the UK indicate that the death penalty is potentially justifiable. Taken together, this means a majority (56%) think it may at least be acceptable in certain circumstances.

In a society like the UK, with a diverse population potentially representing the worldviews of other countries, it will be important to note how different sub-sections of society may have quite radically different attitudes. There are also significant variations in attitudes of different age cohorts, with Gen Z being by far more liberal than Baby Boomers.

These variations show up some of the challenges for those developing public policy, and for organisations’ HR policies. The variety highlights the dangers of regarding one’s own attitudes as the norm, when others may prefer to reverse the positive or negative scales – in some societies “liberal” can be an insult. The way that the UK and US responses have ebbed and flowed also shows that the “*transition*” model of progress reflects an underlying value set.



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The analysis reminds us that foresight projects – and decision-makers – need to be aware of stakeholders' views and recognise their own prejudices. It also shows the power of social attitudes, as well as their flexibility over time and between generations.

Written by Huw Williams, SAMI Principal

Published 10 March 2023



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What Is Cutting UK Productivity?

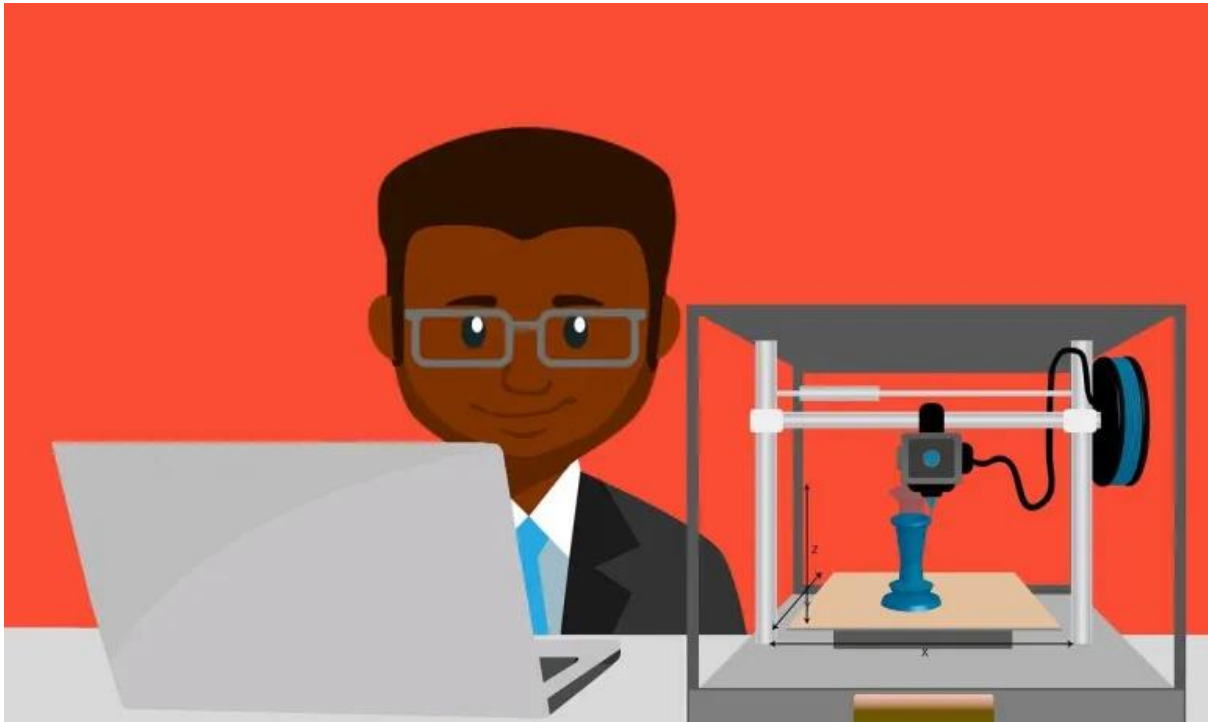


Image by Mohamed Hassan from Pixabay

Written by Gill Ringland, Ed Steinmueller & Patricia Lustig, this blog first appeared at the end of June as a Pamphleteer in the Long Finance series, <https://www.longfinance.net/news/pamphleteers/what-is-cutting-uk-productivity/>

In “Global Risk – is Software the ‘Vlieg in de soep’?” we first flagged a potential new threat to the economy and society. In addition to threats from war, volcanoes, global heating, we could see that our digital society exposed us to a less remarked upon threat. This is the threat from software failures.

We have since developed this thinking further, including through a joint round table with the National Preparedness Commission (NPC). The NPC is tasked to promote better preparedness for a major crisis or incident. The [report from the roundtable](#) concluded that “The software element of digital systems failure is a cost to economy and society which will only increase as software has become a utility, is in wider usage, and more vulnerable to failure.”

In addition to the threat from catastrophic software failures, we also started to think about their insidious effect.



It is well known that the UK's productivity and productivity growth has lagged the US and – for most of the last two decades – that of the eurozone. While it is only human to look for a silver bullet such as AI, here we suggest measures that would underpin the silver bullet if and when it arrives, and could also increase productivity in the meantime.

The authors have been exploring the risks to UK productivity from software failure for the last two years through a BCS Working Group. Their report “Digitalisation – software risk and resilience – a policy think piece” compared the cost of software failures to the economy with that of road accidents, and found them to be comparable.

Software is now pervasive, and software services are now delivered through complex tightly coupled systems, with unpredictable failure modes. This requires new approaches to the measurement, mitigation and management of software risk and resilience.

The Department for Culture, Media & Sport (DCMS), with the Department for Software, Innovation and Technology (DSIT) issued a “Call for views on software resilience and security for businesses and organisations” in February 2023. The BCS response to the call emphasized that digital – software – failures are already impacting the productivity of the UK. Many services in sectors not thought of as digital are dependent for their delivery on software – from ecommerce to entertainment to government services. Productivity, in economics, measures output per unit of input, such as labour, capital, or any other resource. Software failures reduce the number of available hours and/or value of hours worked by users of digitally enabled services.

One of the recommendations of the BCS response was that government could lead on sharing information about breaches in digital services. Metrics for this are defined in the Network and Information Systems (NIS) Directive and Regulation for Regulated Data Service Providers (RDSPs). The four metrics are availability (user hours lost); integrity, authenticity, or confidentiality (user data compromised or services delivering wrong information); risk (to health, safety, or life); material damage to users (financial impact).

This “governance by accident” model is also being proposed for AI systems. Accidents could be defined as breaching service levels using a set of metrics as above. This approach measures the impact (rather than exploring the technical cause) of the failure. The impact approach is being actively considered by the insurance industry, as the legal costs of proceedings to determine the root cause of failure – or whether it was state sponsored or private hacking – mount up over years.

There are complications in the impact approach, but there are precedents. The DCMS's publishes the names of RDSP organisations and fines levied for loss or unauthorised access to customer data. As a regulator, they are empowered to require reporting of breaches over a threshold value of the metrics. It is also suggested that regulators for Other Essential Services (Energy – electricity, oil and gas, transport – air, rail, water and road, health – healthcare settings (including hospitals, private clinics and online settings),



water – drinking water supply and distribution and digital infrastructure – TLD (top-level domain) name registries, DNS (domain name systems) service providers and IXP (Internet exchange point) operators) should impose similar requirements.

Could a “governance by accident” approach to reporting on resilience improve other factors which are affecting UK productivity?

“User hours lost” came to mind when one of us was recently caught up in a blockage of the M1 and was delayed by two hours. The cause was apparently a lorry breaking the safety fence on a cross-bridge and hanging in the air over the motorway. A delay of two hours for all the stranded vehicles translates into a likely loss well in excess of the 750,000 user hours in the NIS Directive definition. However, a quick look at the Department for Transport website does not appear to report on user hours lost, though the impact of loss of productive time is surely an important contributor to the UK’s low productivity.

As the UK looks to invest in strategic areas of science and technology, perhaps measuring and tackling digital and physical infrastructure resilience factors which are holding back UK productivity, should be explored in parallel.

The framework above would seem to provide a possible starting point. It provides a language for describing the lack of resilience of infrastructure that we all know is cutting UK productivity off at the knees. Further, becoming known for reliable digital services in our new complex environment would add to the UK’s global competitiveness.

Written by Gill Ringland, SAMI Emeritus Fellow, Ed Steinmueller & Patricia Lustig, SAMI Principal

Published 13 July 2023



Looking to the future – some themes for 2024



Image by Wilfried Pohnke from Pixabay

Futurists dislike short-term thinking. It doesn't play well with our models, emphasises blips over trends, and gets in the way of dealing with the big issues in favour of dealing with today's – or tomorrow's – crisis. That being said, 2023 has been a very good year for seeing some trends develop – some “pockets of the future in the present” – which may extend further in 2024.

So, in deference to the season's apparent need for predicting the next year, in the often vain hope it will be better than the passing one, here are some thoughts about the trends of 2023 which we see playing an important part in 2024.

The continued evolution of **artificial intelligence** and other technologies has been a significant theme. From breakthroughs in machine learning to the widespread adoption of AI in various industries, these advancements have begun to significantly alter the landscape of work, ethics, privacy, and even daily life. OpenAI's board disruptions around the development of Q* point the way to step-change development; Google's issues with Gemini show that the development is not a straight line. Fairly soon, this thing is going to get exponential, though probably not in the short term.

The growing urgency around **climate change** has seen increased emphasis on sustainability. This includes innovations in renewable energy, policies aimed at reducing



carbon emissions, and a greater focus on sustainable practices in both personal and corporate spheres. Depending on who you read, we're almost too late, or, at least according to the president of COP28, we can keep pumping oil and gas. As the 2023 Natural Resources Forum "ESG Week" showed (full disclosure – the author chairs the NRF), the oil, gas, metals and mining industries understand the importance of making even the most unlikely sectors climate-neutral. Maybe 2024 will be the year that politics catches up with science and industry.

The world continues to grapple with the aftermath of the **COVID-19 pandemic**, focusing on recovery and preparedness for future health crises. This includes advancements in healthcare technology, vaccine development, and global health policy reforms. Whilst the UK's Covid-19 Inquiry grinds slowly on, some lessons are already being learned for the future.

Economic recovery post-pandemic has been uneven, highlighting issues of inequality and the need for more inclusive economic policies. Discussions around universal basic income, wealth distribution, and the impact of automation on jobs have been central. Faltering economies cause social hardship and disruption. As poverty rises, hopelessness comes along too.

Many countries have experienced increased **political polarisation**, impacting governance and international relations. The rise of populist movements, debates around misinformation and free speech, and the changing role of global alliances are key aspects of this theme. There is almost too much to say here – 2024 could see a widespread rise in the hard right across Europe; Trump could be the next US president. Misinformation threatens civil society, political structures, and people's faith in democracy. Europe and America have a "pro-Putin populist problem" with obvious implications for Ukraine, the Baltics and the world.

As more of our lives move online, cybersecurity and digital privacy issues have become increasingly important. This includes protecting personal data, the threat of cyber attacks, and the ethical implications of digital surveillance. Scenarios developed during Cyberevolution 2023 highlighted the vulnerability of everything from personal data to critical national infrastructure. And, considering how many elections are taking place in 2024, the integrity of national elections is vital. The quiet drumbeat of nation-state-level cyber attacks has not yet reached cyber warfare. But they could.

The transformation of the **educational sector and the evolving nature of work**, accelerated by technological advancements and the pandemic, are significant themes. There's a growing emphasis on lifelong learning, digital literacy, and adapting to a changing job market. We know from our work at SAMI that concerns about the future of skills, education, and work are widespread. As nations struggle with productivity challenges, those concerns will only increase.



Social justice movements, cultural shifts, and discussions around **identity and diversity** rattle societies globally. These movements influence policy, corporate practices, and societal norms. Whether it's through the trans debates in the US and UK (no links here as they're mostly frankly depressing – this is not a place where people seem to be balanced) or the increasing voice of the First Nations in the climate challenge, civil society is finding ways of engaging with its own future. Inevitably fissiparous, divided and without the power of governments and armies, expect to see increasing action on the streets as people seek to reclaim some of the power they feel they are losing through economic disparity and unhearing governments.

Which takes us to the debate around the benefits and challenges of **globalisation**. Supply chain disruptions, trade wars, and the reshaping of global alliances are the big themes. Social disorder, reshoring, anti-immigrant sentiment (and laws, such as the Safety of Rwanda (Asylum and Immigration) Bill), “citizens of nowhere” vs “citizens of somewhere” disrupting electoral projections – all spin from globalisation and affect internal and external policies in jagged and unpredictable ways.

There could have been more trends than just these nine. They all intersect and interact unpredictably, often dangerously. There are doubtless many positive trends – many examples of kindness, thoughtful thinking, and the slow and steady development of a better world. It is difficult to see them when the “pockets of the future in the present” present such compelling evidence of change and of an uncertain response to that change from the people most affected by it.

We look forward to 2024 – we hope it is successful and peaceful for all of us. We fear that that success and peace may be rare.

Written by Jonathan Blanchard Smith, SAMI Fellow and Director

Published 15 December 2023