Brian Williamson and Mark Bunting

Reconciling private market governance and law: A policy primer for digital platforms

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About the Authors

Brian Williamson is a Partner at Communication Chambers and has extensive policy and strategy experience in relation to applications, networks and radio spectrum. He has worked on the benefits of, and policy in relation to, mobile apps and the internet.

Mark Bunting is a Partner at Communications Chambers, having previously held senior strategy roles at the BBC and Ofcom. He has worked on the implications of the growth of platforms for content regulation and on their benefits for public policy goals. He is a visiting associate at the Oxford Internet Institute.

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1. Executive summary

The role and appropriate regulation of platforms have taken centre stage in digital policy debates. Governments and the European Commission are reviewing policy, with the OECD report on digital trends for the G20 in January 2017 noting:

> *"Online platforms create new markets and opportunities, but also raise a range of economic and social challenges…"*

The focus of this paper is the opportunities and anxieties presented by digital platforms; and the challenge of reconciling code and law.

Nature of digital platforms

Platforms allow multiple market participants to transact and interact. Platforms are as old as the bazaar, but digital platforms operating at scale are a recent phenomenon.

Digital platforms lower the cost of interacting and transacting, and have created new markets. They are a core element of the digital economy, and facilitate digital transformation of previously "analogue" services. Examples include mobile apps stores, social networks and sharing economy intermediation services.

Economic impact of digital platforms

Digital platforms, whilst representing a tiny share of GDP, are emerging as drivers of growth. Platforms and cloud services are estimated to have had a material impact on productivity growth, with the majority of benefits due to diffusion and use of cloud and platform services, rather than provision.

Further productivity growth would not be expected to result in reduced employment, but will involve a reallocation of jobs throughout the economy, with implications for skills and income distribution. Previous productivity accelerations have seen a widening of the wage skills premium, though it subsequently narrowed.

If distributional issues flowing from innovation and growth are a concern, we should protect consumers not producers, and workers not jobs. We should not assume dystopia, and choose the future we want – facilitating the upside whilst mitigating any downside.

Policy

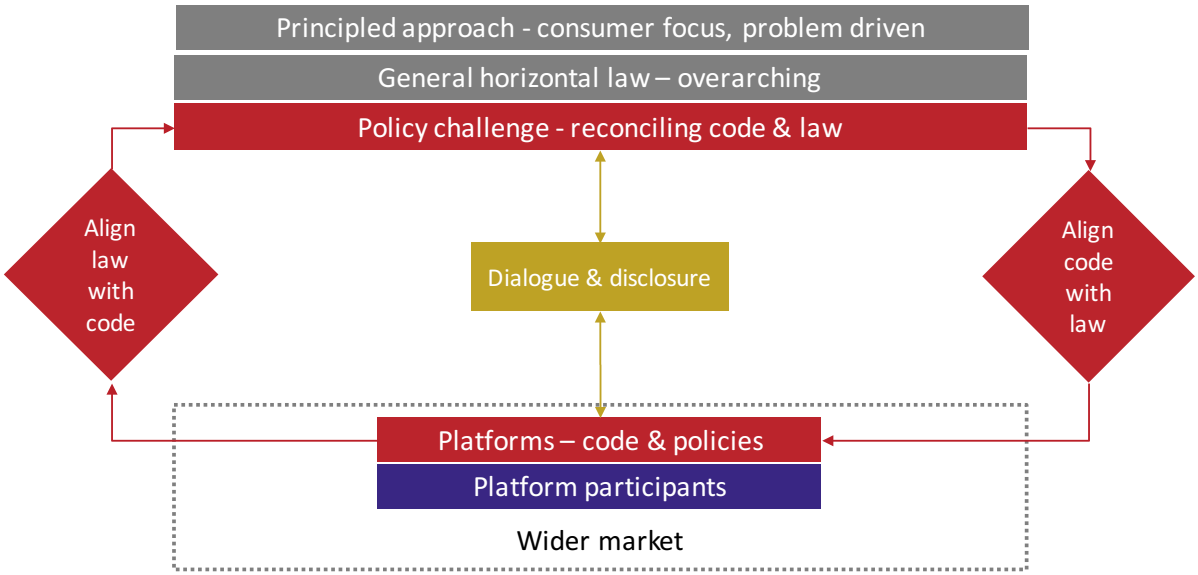
Platforms have posed questions for competition regulation and a range of other policy areas. Challenges arise as online meets offline, where the old rules may offer a poor fit with the new technology and market structure.

In relation to market power, we have a number of platforms that compete vigorously, though their core business focus and business models differ. As recently as a decade ago the market was more concentrated, with one major software provider. The market is now much more competitive and dynamic, and no platform feels safe, which is as it should be.

Further, digital platforms and services have brought competition to previously uncompetitive markets, and lowered the costs of growing businesses which can use platform services, such as apps stores, to scale.

Should competition problems arise, competition policy should be the first recourse, and authorities have shown that existing frameworks can be brought to bear. The focus of competition policy on consumers' not producers' interests, and on competition rather than wider policy questions, is a strength.

In relation to wider policy, the range of issues is as diverse as the economy, reflecting the ongoing "collision" between offline and online, atoms and bits. A complaint, or complement insofar as innovation is concerned, is that the new players are "lawless", but a deeper concern may be that they are "law makers" – in terms of code versus law. However, a unifying theme is the need to rethink law alongside code, to reconcile private market governance and the role of public policy (see the following figure).



New policy approaches are needed. The extension of existing rules relating to specific economic verticals to new technology and markets is, in general, unlikely to be preferred. As Edith Ramirez, the former Chair of the Federal Trade Commission, put it in 2015:

> *"…existing regulatory schemes tend to mirror, and perhaps even entrench, traditional business models and thereby chill pro-consumer innovation".*

The challenge is to reconcile private market governance (code and codes of conduct) and law, to ensure compatibility between public and private regulations, rather than to reflexively meet demands to "level the playing field".

In contemplating intervention policy makers should focus on clearly defined and evidenced problems, take account of platform market governance and be cautious of unintended negative consequences, including raising entry barriers and foreclosing the benefits of the dynamic evolution of platform market governance and the overall ecosystem. Transparency can be helpful, but it is important to be clear about 'transparency of what'. Too much transparency could enable the gaming of platform governance.

Dialogue is called for between policy makers and platforms to increase mutual understanding, maximise benefits and anticipate challenges. In some instances, the exercise of 'soft power' may be required to align the interests of platforms and platform participants with the public interest, by 'nudging' platforms to address issues that are external to their governance incentives. In others, the need for legitimacy and political accountability may call for a more direct approach, including co-regulatory models. Finally, as The Economist put it in "Chaining Giants" in August 2017, we should keep what works:

> *"Governments sometimes have good reason to claim sovereignty over the digital realm. They are responsible for national security and elected to uphold national laws. But their regulatory push threatens to create a "splinternet", with national borders reproduced in cyberspace. That would harm the internet's function as an open forum where people can communicate freely and come up with new global products and services—which is precisely what made it great in the first place."*

2. The rise of platforms – opportunities and anxieties

Platforms have long existed, but economically important digital platforms are a comparatively recent phenomenon. They enable direct interactions between two or more distinct sides of a market.[1]

Digital platforms have grown in response to the need to manage the complex open markets enabled by the Internet, that can involve millions or even billions of buyers and sellers. They are arguably an inevitable consequence of, and necessary part of, a well-functioning information society. But like any powerful 'technology', they create opportunities and raise anxieties. As the OECD put it:[2]

> *"Online platforms create new markets and opportunities, but also raise a range of economic and social challenges…"*

The opportunities need to be maximised and the challenges filtered – what is real, what is imagined and what is self-correcting?

The opportunity is the economic and social contribution platforms are making and their potential to offer more; the anxieties include concern over the domicile of digital platforms, the potential impact on jobs and the distribution of income, market (and broader) power and other policy challenges arising from the intersection of the old economy and rules with the new. The aim, as with previous powerful 'technologies', should be to seek to maximise the good and mitigate the bad.

In this section, we focus on the economic benefits of platforms, their prospective growth contribution and the potential impact on jobs and the income distribution. The analysis is necessarily broader than platforms *per se*, taking in cloud services and information and communications technology (ICT) generally.

In subsequent sections, we consider competition and dynamics in platform markets, the impact on competition in the wider economy and policy in relation to platforms and platform-mediated markets. In relation to policy we call out the fact that code, as in software code and codes of conduct developed by platforms, can be both a substitute and complement to legal code and regulation.

Platforms make an outsize contribution to the economy

ICTs drive economic benefit primarily through their use, not their production, as the European Commission have noted:[3]

> *"Digitisation of all sectors will be needed if the EU is to maintain its competitiveness, keep a strong industrial base and manage the transition to a smart industrial and services economy. 75% of the value added by the Digital Economy comes from traditional industries, rather than ICT producers…"*

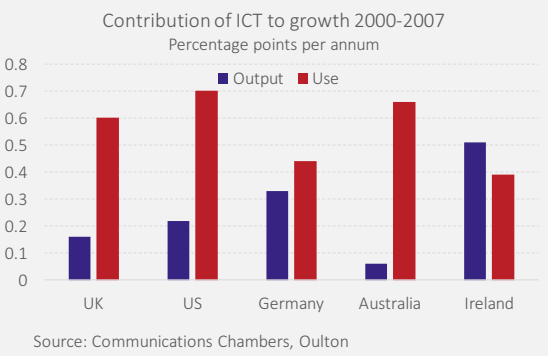
Bryne and Corrado (2017) estimate that for the US, over the decade to 2014, ICT use implies a contribution of 1.1 percentage points per year to growth whilst ICT production implies a contribution of 0.3 percentage points per year. [4]

Further, Figure 1 (for the earlier period 2000-2007) shows that countries with a relatively small ICT sector may see a substantial contribution of ICT to growth e.g. Australia; whilst countries with a large ICT sector may see

[1] Hagiu and Wright, *Multi-Sided Platforms*, Harvard Business School Working Paper 15-037, March 2015.
[2] OECD, *Key Issues for Digital Transformation in the G20*, January 2017.
[3] European Commission, *A digital Single Market Strategy for Europe - Communication from the Commission*, May 2015.
[4] Bryne and Corrado, *ICT prices and ICT services: what do they tell us about productivity and technology?*, September 2017. Federal Reserve Finance and Economics Discussion Series 2017-015.

a comparatively small contribution of ICT use to growth e.g. Ireland.[5]

Figure 1: ICT growth contribution



In other words, you don't have to make it to use it, and the country of domicile of ICT production is less important than ensuring technology diffusion and use. Economic flexibility and openness, key requirements for diffusion and use, are also the conditions most likely to foster emergence of home grown platforms.

Platforms play a major role in growing and dispersing ICT use. While growth accounting estimates – using national accounting data - of the benefits of platforms *per se* are not available, estimates have been made for cloud computing services. Bryne and Corrado (2017) conclude, for the decade to 2014, that:

> *"…the balanced growth contribution of ICT to U.S. labor productivity growth is very large—1.4 percentage points per year. About 25 percent of this total ICT sector contribution owes to the diffusion of ICT technology via purchases of cloud and related ICT services."*

It remains somewhat of a puzzle that we appear to be witnessing rapid technological change alongside a slowdown in measured productivity growth post-2007 (though the financial crisis no doubt played a part in this).

Various explanations for the persistence of this apparent paradox have been considered. In part, this may be due to measurement issues in relation to the shift from investment in local computing to cloud services, which the work Bryne and Corrado (2017) seeks to correct. It may also reflect a new phase of ICT adoption including cloud and platform services that, initially, involve an economic adjustment phase, in which case the productivity slowdown could presage a productivity growth acceleration.[6]

Finally, not all of the benefits of ICT and platforms are reflected in GDP, particularly in relation to services that may be free at the point of consumption. Estimates suggest these benefits are large.[7]

Platforms are valuable, but make up a small share of GDP

Digital platforms, and businesses that include digital platforms, are amongst the most valuable companies. This is unsurprising, given the growing importance of digital throughout the economy and the role of platforms in lowering transaction and information processing costs, and in providing governance which enables markets to function.

Sometimes platform market capitalisations are compared to individual countries' GDPs, to emphasise scale. Such comparisons provide a distorted picture. Whilst some platforms are very valuable, they are also global, and their value reflects both current and anticipated earnings. Conversely, GDP is per annum and any given country is a fraction of global GDP.

[5] Oulton, *Long Term Implications of the ICT Revolution*, November 2010.
[6] Brynjolfsson, Rock and Syverson, *Artificial Intelligence and the Modern Productivity Paradox: A Clash of Expectations and Statistics*, November 2017. NBER Working Paper 24001.
[7] Examples of the benefits of choice and free services include:
Brynjolfsson, Hu and Smith, *Consumer Surplus in the Digital Economy: Estimating the Value of Increased Product Variety at Online Booksellers*, 2004.
Brynjolfsson and Oh, *The Attention Economy: Measuring the Value of Free Digital Services on the Internet*, 2012.

The combined annual revenues in 2016 of Google, Apple, Facebook, Amazon and Microsoft were around US$555 billion versus global GDP of US$78,000 billion (in 2014), or around 0.6% (allowing for global GDP growth of 3% per annum to 2016). The share associated with platform services is even lower, around one-third of their revenues or 0.2% of global GDP. Even this overstates the scale of platforms, since the value added of platforms will be less than their revenues (GDP is a value-added measure).

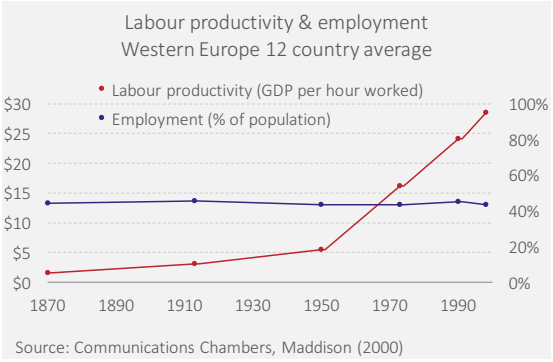
Platforms are small relative to GDP, but make a large contribution in terms of economic and other benefits throughout the economy.

The long view – opportunities and anxieties

ICT, and platforms as a key component of ICT, can be expected to contribute to economic growth over the coming decades. Nevertheless, change involves anxiety. The following discussion touches on these opportunities and anxieties, which whilst not particular to platforms *per se* (and tend to be more focussed on AI and robotics than platforms or ICT generally), do influence the tone of debate about policy in relation to platforms.

History provides a guide to what we might expect from innovation, though it is possible that the impact of future innovation will be different. Technology - steam, trains, electricity, cars and computers - in Europe from 1870 through to the Millennium resulted in a 10-fold increase in productivity (split between 5-fold real income growth and increased leisure) and no change in employment per capita (Figure 2).[8]

Figure 2: Productivity growth and employment



Some sectors, such as agriculture, saw rapid productivity growth; and whilst real output grew agricultural employment declined as a share of overall employment – from 37% in 1820 to 2% in 2000 for the UK.

As tasks are automated labour is reallocated. What people do may change, but overall employment remains more or less constant. There are two fundamental reasons for this. First, innovation is both labour substituting and labour augmenting, for example, many new jobs have been created developing mobile apps. Second, income growth driven by innovation increases demand for goods and services, so sectors of the economy not directly related to technology-driven automation may grow as a result.[9]

There are grounds for expecting the historical pattern to continue, with sectors subject to automation growing in real output terms but shrinking as a share of GDP, and with jobs reallocated to other areas of the economy.

Over time labour is concentrated on those activities that are important but hard to automate, for example, health care, child care and education. The tendency of those sectors with low productivity growth to persist, and even grow as a share of GDP, is referred to as Baumol's "cost disease".[10] It should, however,

[8] Maddison, *The World Economy – A Millennial Perspective*, OECD Development Centre Studies, 2000.
[9] Autor, *Why are there still so many jobs?*, Journal of Economic Perspectives, Volume 29(3), Summer 2015.
[10] William J. Baumol , *Children of performing arts, the economic dilemma: The climbing costs of health care and education*, Journal of Cultural Economics, Volume 20, Issue 3, September 1996.

not be thought of as a disease, but an inevitable consequence of rapid productivity growth in some areas of the economy and not others.

Beyond concern regarding jobs – which appear misplaced – there is also concern regarding inequality. In a number of countries median income have stagnated, whilst the share of national income going to capital versus labour increased post 2000. However, these changes largely pre-date the platform era, and their causes are complex and difficult to disentangle, including the one-time shock of China joining the global market.[11]

Growth in inequality may also reverse, as it did during the previous productivity acceleration associated with electrification.[12] Recent evidence also shows a return to growth in median income in the US, but as The Economist asks – "Can it last?".[13] The honest answer is we don't know whether inequality will grow or subside in future. What we do know is that we can choose to do things to address inequality, which is a general issue beyond the focus of this study.

It is, however, instructive to consider possible future scenarios. Aghion, Jones and Jones (2017) have modelled AI-driven automation over the long-run.[14] Under certain assumptions automation is equivalent to labour-augmenting and capital-depleting technical change, driving the capital share of income asymptotically towards zero in the very long-run i.e. a few centuries. Further, with intermittent waves of automation, the capital share of income can temporarily rise when growth slows, which corresponds with recent experience.

Conclusion

Innovation and growth are not inevitably associated with declining employment and rising inequality. Indeed, the reverse has held historically. What we should do is prepare people for change, help them adjust and ensure the benefits of innovation are widely distributed, not protect the *status quo*.

The alternative, of slowing innovation and seeking to protect existing ways of doing things would result in stagnation, and would likely worsen inequality.

The potential prize from innovation is large and we should seize it, as a paper for the European Commission on ICT and productivity concluded:[15]

> *"Conditional on the policy environment, labor productivity growth in the EU of 2.5 percent per year for the next 20-30 years appears attainable."*

It is up to us to choose the path we take, to seek to maximise the benefits whilst minimising potential harm.

[11] The Peterson Institute for International Economics (PIIE), *Has Global Trade Fueled US Wage Inequality? A Survey of Experts*, August 2017.
[12] Jovanovic and Rousseau, *General purpose technologies*, 2005.
[13] The Economist, *Blue-collar wages are surging. Can it last?*, November 2017.
[14] Aghion, Jones and Jones, *Artificial Intelligence and Economic Growth,* October 2017.
[15] Bartelsman, *ICT, Reallocation and Productivity*, European Economy Economic Papers 486, April 2013.

3. Platform markets are dynamic

Technological change disrupts platforms

Technology markets are characterised by disruptive transitions: on the hardware side, from the mainframe to the PC, and from the PC to the smartphone and cloud computing; on the software side, from mainframe to distributed software, from shrink wrapped software to the internet and downloads, apps and open-source tools. These changes have resulted in short lives for some companies, and a change of fortunes for others.

To the extent that some companies have weathered the pivot to mobile-apps and cloud, that may be because they have learned from those they first disrupted,[16] and that is not a bad thing. Successful platforms must adapt to survive, and through innovation they disrupt one another.

Internet companies began adopting "mobile first" strategies from 2010, and some companies are now mobile only e.g. Snapchat. Others were disrupted, including Blackberry and Intel/Windows (Microsoft ultimately adopted a multi-platform strategy with the release of Office for iOS and Android in 2015[17]).

Machine learning, or artificial intelligence (AI), is also disrupting the market. It allows new forms of computer interface, since voice and now images[18] can be understood, potentially disrupting search-based advertising models and opening new opportunities for entrants. AI, however, will have impacts well beyond the interface. The shift to virtual, augmented and mixed reality (VR, AR and MR) is also likely to prove disruptive, shifting the device and software mix and creating new interfaces.

Change and disruption are the norm, with no clear end in sight. Successful platforms must repeatedly transform themselves, and not all have succeeded. Platforms cannot afford to be complacent.

Shifts in tastes can disrupt platforms

Changes in tastes may also disrupt markets, particularly for social media and communications apps. Multi-homing (the opportunity to have multiple services on a devise) means that consumers can try a new service,[19] whilst continuing to use an existing service. Further, the shift to sharing and consuming a stream of content rather than curation of a profile lowers switching costs i.e. there is less need to port content (photos and contacts may, in any case, be stored independently of a given app). Network effects may nevertheless reduce switching.

Platforms compete with one another

Platforms compete with one another, even though their business models (including device, advertising, subscription and commission based models) and core markets may differ. For example, Amazon, Facebook, Google, Microsoft and Apple all offer online communications apps and compete in the nascent market for intelligent assistants.

Such services are beachheads, which could grow in importance as platforms. This sort of competition at the boundaries provides an important spur for innovation. As analyst Benedict Evans put it:[20]

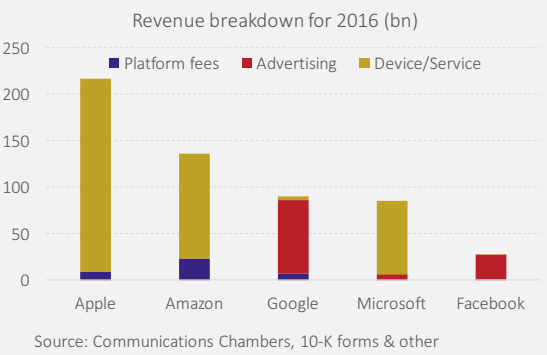
> *"…the market is big enough for four tech giants, not just one (Wintel) partnership, means we have four companies*

[16] A16Z podcast, *The strategies and tactics of big*, 7 August 2017.
[17] Microsoft blog, *Office everywhere: More great news for Office on iOS and Android*, January 2015.
[18] Benedict Evans, *Mobile 2.0*, January 2017.
[19] FT, *Snapchat's youth appeal puts pressure on Facebook*, 22 August 2017.
[20] Benedict Evans (blog), *The scale of tech winners*, October 2017.

aggressively competing and cooperating with each other, and driving each other on, and each trying somehow to commoditise the others' businesses."

Figure 3 shows a revenue breakdown for Google, Apple, Facebook, Amazon and Microsoft into platform commission fees (for apps stores and Amazon marketplace), advertising and device and service revenues.

Figure 3: Platform services are one element of a diverse set of technology companies



Less than one-third of overall revenues relate to multi-sided platforms, and whilst personal data based advertising revenues are significant, they are not dominant. Generalisations about such a disparate set of companies and services are unwarranted. Rather, an issue by issues analysis is called for.

The market is, however, not limited to Google, Apple, Facebook, Amazon and Microsoft. Baidu and Tencent, who have scale in China, could emerge as global competitors. In November 2017, the value of Tencent – who own WeChat and other services – surpassed that of Facebook.[21]

There is also a proliferation of platforms focused on specific verticals that compete with large multi-sector platforms. For example, in e-commerce there are a number of European success stories including Zalando, Yoox Net-a-Porter Group, Fartech and Delivery Hero that have experienced rapid growth.[22]

Data may not be "the new oil"

It is also notable, that whilst some claim that information is power – that data is the new oil[23] – data is not central to all platform based business models. For example, in Figure 3 above, the company with the greatest revenues – Apple – does not monetise personal data.

Further, it is insights rather than data *per se* that provide value, and machine learning is opening up scope to gain insights from unstructured data. DeepMind has also demonstrated the capability to learn without pre-existing data.[24] There may be diminishing marginal returns from data, and its value degrades over time.

There is a steady stream of start-ups

Developers and venture capitalists are continually identifying opportunities and testing the market. Wired magazine produces an annual briefing on start-ups in the European ecosystem, identifying promising start-ups from around Europe.[25] Whilst not all may succeed, some will, and they are all testing the market. Here are some examples:

- In Berlin, Careship provides a digital marketplace which matches families with at home helpers whilst MoBerries offers a data centric recruitment platform.
- In Barcelona, Lodgify allows people to set their own rules when renting property and Badi which uses machine learning to match people with empty rooms in shared accommodation.

[21] CNBC, China's Tencent surpasses Facebook in valuation a day after breaking $500 billion barrier, 21 November 2017.
[22] The Analyst for CCIA, *European E-commerce – investment & innovation: a competitive marketplace?*, November 2015.
[23] The Economist, *Data is giving rise to a new economy*, 6 May 2017.
[24] Silver et al, *Mastering the game of Go without human knowledge*, *Nature*, Volume 550, 19 October 2017.
[25] Wired, *Europe's 100 Hottest Startups 2017*, October 2017.

- In Paris, Zenly is a social network that allows members to share their location with family and friends whilst Algolia provides a real time search algorithm service for partners including Vevo and Twitch.
- In Lisbon, Misk is an invitation only social network for foodies whilst Landing.jobs matches tech professionals with companies.
- In Stockholm, Kry connects patients with doctors and therapists whilst Soundtrap lets artists collaborate on music and podcast projects.
- In Amsterdam, Vanderbron matches customers with local energy suppliers such as farmers with wind turbines whilst Blendle allows subscribers to pay for single articles from news outlets.
- In London, Mush lets new parents connect with other locally, chat, swap and sell items whilst Seenit can find you a film crew.
- In Helsinki, Yousician has opened the platform to allow let subscribers add their own music exercises whilst Smartly facilitates add on other platforms including Facebook.

New niches in the digital ecosystem are continually tested and explored, bringing innovation and maintaining competitive pressure.

Platforms compete with non-platform services

A platform may be prominent in an "online" market (including those facilitating "offline" activity), but may be competing with non-platform services. Airbnb competes with hotels; Uber competes with conventional taxi companies and other modes of transport; apps compete with web services and apps stores compete for subscriptions with direct B2C subscriptions; communications apps compete with legacy voice and SMS; YouTube competes with linear TV and Netflix, at least for younger viewers; whilst eBay and Amazon compete with bricks and mortar retailers.

An illustration of the limited scale of some online services is e-commerce, which accounts for 8.5% of retail sales globally and 10% in the US.[26] Online as a proportion of retail sales has grown at less than one percentage point per annum, and whilst the direction of travel is clear, offline remains the dominant form of retailing. Within online retail, multi-sided platforms make up only a fraction of sales, with many legacy retailers and entrants selling direct to consumers online.[27]

Platforms do not foreclose third party services

Platforms support third party services that compete with their own direct offering. Amazon supports third party sellers via Amazon Marketplace (with half of global sales estimated to be by third parties[28]), Apple and Google Apps stores support apps that compete with their own services including office productivity, music streaming, maps and online communications.

Google have numerous applications available on Apple iOS, including maps and an intelligent assistant which compete with core Apple services. Apple also chooses to make some applications available on other platforms, for example, Apple Music is available on the Google Play store (with integration with Google voice commands), as is the app "Move to iOS". Apps stores do not foreclose on competitors, indeed may view competitors as complements in best meeting the needs of their users.

Machine learning is increasingly accessible

Machine Learning (ML), a form of artificial intelligence (AI), with its dependence on data,

[26] The Economist, *E-commerce – The new bazaar*, October 2017.
[27] The Economist, *A new class of startup is upending America's consumer-goods industry*, November 2017.
[28] Fung Global Retail & Technology, *Third-Party Sales, Cloud Services Drive Amazon's Profitability*, June 2017.

might be thought to be an area where there was a risk that one platform would gain an enduring advantage over other platforms.

However, the academic roots of AI and desire to spur innovation have contributed to a comparatively open culture with Apple publishing a machine learning journal[29], the not for profit "OpenAI"[30] publishing and promoting open dialogue, Facebook AI Research[31] open source code and Google DeepMind publishing, collaborating with academia and providing open source data sets and code.[32]

Development tools have also been made available including Google "TensorFlow", whilst Apple have announced "ML Frameworks" and "Core ML" which supports the integration of AI into apps and Amazon offer AI specific support on Amazon Web Services. A specialised hardware design for AI has also been open-sourced by Facebook.[33]

Advances in mobile device processing power and software tools also make the local implementation of AI on mobile devices possible. Not only does this allow offline use of AI without consuming data allowances or where connectivity is unavailable, it also provides a means of protecting user privacy.[34] Techniques also exist for making statistical inferences about a group without revealing information about an individual.[35]

Machine learning is a competitive, and comparatively open field. As Benedict Evans commented:[36]

> *"…many ML techniques are getting commoditised and pushed into developer APIs and onto devices and apps very fast. There won't just be one Google or FB cloud that does all the 'machine learning' - this is a foundational tech that will be in everything."*

Cloud based machine learning as a service,[37] and developer tools, are ensuring that advanced techniques will be available to third parties, who need not understand the detail but can instead focus on developing powerful apps for users. AI will be in everything, with developer tools accessible to everyone. These developments reflect the value to platforms of ensuring that AI tools are widely available, to support the overall ecosystem.

Conclusion

Platform markets are dynamic and platforms compete. Platforms also tend to be open to competition involving third party services, consistent with the aim of meeting platform participants needs.

Competing platforms also involve diverse business models for which generalisations appear unwarranted. Rather, an issue by issue analysis is called for.

[29] *Apple Machine Learning Journal*.
[30] *OpenAI*.
[31] *Facebook AI Research*.
[32] DeepMind, *Open Source*.
[33] Facebook, *Facebook to open-source AI hardware design*, December 2015.
[34] Apple Machine Learning Journal, *An On-device Deep Neural Network for Face Detection*, November 2017.
[35] Wired, *Apple's 'differential privacy' is about collecting your data—but not your data*, June 2016.
[36] *Benedict's Newsletter*, 2017.
[37] Ars Technica, *Machine-learning cloud platforms get to work*, September 2017.

4. Platforms facilitate dynamism throughout the economy

Platforms support entry and scaling-up

For users, including SMEs, cloud and platform services lower start-up costs and entry barriers. For the wider economy, this is pro-competitive.

Lower up-front capital expenditure, and IT expertise, is required to start a range of businesses, and the minimum required scale has declined. An example is app development, with over 2 million apps now available in the iOS and Android apps stores after less than a decade.

Many other businesses have seen their costs lowered by platforms, particularly their up-front costs. A professional services company may once have required a library, an in-house server, IT support and local presence. These requirements required scale to be commercially viable. Professional services can now be provided by individuals and small teams, working within a single firm or collaboratively across firms, with minimal start-up costs and with global reach.

A study for the UK Office of Fair Trading (OFT) on the impact of online markets on SMEs noted that:[38]

> *"Online marketplaces such as eBay and Amazon Marketplace have significantly reduced financial and reputational barriers to entry for SMEs wishing to trade online. These marketplaces provide web presence, marketing and payment services and, in the case of Amazon, fulfilment. This allows SMEs to focus on their core competencies e.g. managing supplier relationships. We found that SMEs have choices online, as these marketplaces compete with each other (some retailers sell across several marketplaces) and retailers own websites. They also compete with paid search providers and others in providing marketing to SMEs."*

Figure 4, reproduced from the OFT study, compares the up-front costs of a retailer setting up in business online versus offline

Figure 4: Comparison of online and offline up-front costs for a retailer setting up in business

Function	Online solution (negligible up-front cost)	Offline solution (significant up-front costs)
Presence	Build a website using a free online website creation service e.g. Weebly.	Lease retail premises.
Marketing	Set up an account with Google for search marketing.	Place advertising in local newspapers and directories.
Payment	Set up an account with PayPal and integrate into the website.	Set up a merchant account and acquire a credit card terminal.
Fulfilment	Use Royal Mail for delivery, fulfilment by Amazon (Larger premises may need to rent premises for storage of stock.)	Fulfilment from retail premises (Costs of holding stock and consumer costs in pick up.)

Since 2010, up-front costs are likely to have fallen further, for example, some no longer see the need for their own website, using social media and apps instead, and with a wider range of cloud services available. New marketing channels have also opened up which are scalable, for example, Facebook has over 5 million advertisers participating on the platform.[39]

[38] Marks, Adshead, Williamson, Sassoon and Jewitt, *Online markets discussion paper*, July 2010.
[39] Reuters, *Facebook's Sandberg says number of monthly advertisers tops 5 million*, April 2017.

Alibaba has set out an agenda to lower the costs of doing business globally, including for SMEs.[40] For example, tea distributor Whittard of Chelsea has increased its access to the Chinese market using Alibaba services, including help in relation to regulatory issues, payments and distribution.[41]

Further, the shift from physical to virtual – from atoms to bits – for services such as music; and from investing in new capital to better utilising existing capital (the sharing economy) has also reduced barriers to scaling up.

Swedish music service Spotify has been able to reach a global audience and scale, in part via apps stores. The number of monthly active users increased from 91 million at the end of 2015 to 126 million at the end of 2016, and paid subscribers increased from 28 million to 48 million.[42] As cloud quality and reliability improved, Spotify has also moved its services to the cloud with Google cloud providing Spotify with data analytics tools.[43]

Apps stores – a platform success story

Apps stores have reduced barriers to entry for developers. Apps stores:

- Support businesses in scaling-up globally.[44]
- Help create new markets and increased competition for legacy businesses.
- Increase scope for diversity, choice and long-tail services.

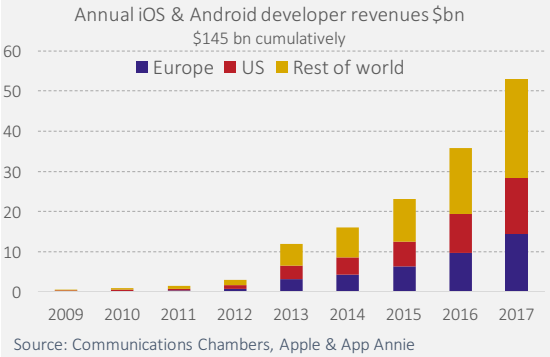
Apps stores facilitate innovation, entrepreneurship and wider economic and social benefits since they provide developers and consumers with:

- Powerful application programming interfaces that let developers build systems that can talk to each other; and developer tools including the open source Apple programming language Swift.
- A means for the global discovery, distribution and monetization of apps.
- Security and trust via apps store brands, app review policies, crowd sourced app reviews and security benefits from a controlled software ecosystem.

Apps stores not only lower the costs of doing business for developers and consumers, but also provide governance which helps overcome 'information asymmetries' that would otherwise limit software from reaching its potential.

An illustration of the benefits of apps stores is the time allocated to apps, which now exceeds browsing and PC use. Another is payments to developers (Figure 5).[45]

Figure 5: Developer revenues



An estimated $145 billion had been paid to developers worldwide by December 2017. However, this excludes other sources of developer revenues including apps related media subscriptions outside of apps stores, subscriptions to services such as accounting app

[40] FT, *Alibaba kicks off ambitious plan for frontier-free global trade*, March 2017.
[41] The Times, *Whittard of Chelsea finds that China's market suits it to a tea*, 11 September 2017.
[42] Spotify, *Consolidated financial statements as at December 31, 2016*, June 2017.
[43] Spotfiy, *Announcing Spotify Infrastructure's Googley Future*, February 2016.
[44] Financial Times, *European tech companies need money to scale up, not just start up*, May 2017.
[45] Estimates based on Apple press releases and App Annie reports of the Android-iOS developer revenue ratio. Regional shares based on Apple Job Creation reports for the US and Europe which provide snapshots of regional revenue shares.

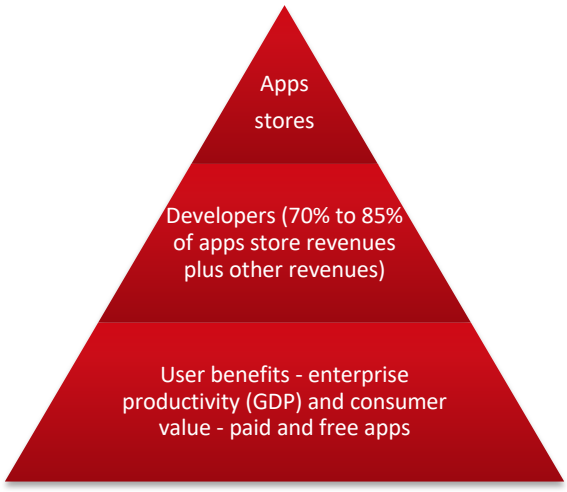
Xero, mobile e-commerce margins and commission revenue for peer-to-peer services.

Additional revenue is also earned by app developers under contract to enterprise and government, to develop apps which do not appear in public apps stores. Apps are also becoming an extension of enterprise services, for example, General Electric have entered into a partnership with Apple to bring the industrial internet of things into the mobile and app era.[46] The associated service revenues, in part attributable to apps, do not flow through the apps store.

Examples of app related revenues earned outside apps stores include advertising revenue attributed by Facebook to mobile which represented 87% of Facebook advertising revenue in Q2 2017, Uber revenues of $6.5 bn for 2016 earned via its mobile apps and an estimate of mobile enterprise application market revenues for 2016 of $48 bn.[47] Non-apps store revenues attributable to apps are substantial.

We therefore have a pyramid in which enterprise and consumer benefits substantially exceed developer and apps store revenues, and in which developer revenues substantially exceed apps store revenues (Figure 6).

Figure 6: Beneficiary pyramid



Platforms support content creation and distribution

The music industry suffered initially, when digital allowed low cost replication and distribution of music, contributing to piracy. Over time, initiatives to tackle piracy, coupled with improved legal digital distribution models including iTunes, subscription and ad-supported streaming services, have seen digital revenues grow and overall revenues return to growth.[48] Digital distribution has also contributed to strong growth for independent labels, as Bloomberg report:[49]

> *"Merlin, an organization made up of some of the world's top indie labels, distributed $353 million to members over the past year -- a 52 percent jump from a year earlier, the group will announce Thursday.*
>
> *The credit goes to streaming -- internet services like Spotify and Apple Music that give listeners access to millions of songs for a monthly fee or for free if they're willing to hear ads [Apple Music is a subscription only model]. No longer needing to press and distribute physical CDs, independent record*

[46] GE, *GE And Apple Team Up To Bring The Industrial Internet To The iPhone and iOS*, October 2017.
[47] Research and Markets, *Mobile Enterprise Application Market by Software*, November 2016.
[48] IFPI, *IFPI Global Music Report 2017*, April 2017.
[49] Bloomberg, *Spotify, Apple Trigger a Resurgence in the Small Record Label*, June 2017.

> *labels can now reach a global audience at lower costs -- and close the gap with the Big Three of Vivendi SA's Universal Music Group, Sony Corp.'s Sony Music Entertainment and Access Industries' Warner Music Group."*

Merlin note that the ability to reach a global market via digital is key:[50]

> *"Digital consumption unlocks global markets - 39% report over half of digital revenues originate from outside their home territory, compared with just 16% reporting the same for physical."*

Access to a wide catalogue of books online has also allowed benefits from increased choice[51], whilst online platforms allow self-publishing. While the average traditionally published author earns about 7.5% of the cover price on every book sold, Amazon's self-publishing division, Kindle Direct, pays 70% of the sale price. Perhaps more important, for those authors rejected by publishers, is the opportunity to reach readers and to feel free to express themselves creatively.[52]

Platforms are also central to growth and innovation of next-generation content services, for example with the launch of augmented reality developer kits by Apple (ARKit) and Google (ARCore).

Platforms help create new markets

Over the longer-term, the big gains come from new services, rather than more efficient versions of what we have already. Platforms not only support start-up and scale-up activity; but support the emergence of new business models, new services and new markets, as examples such as Airbnb, Etsy and Uber show.

Platforms increase competition in established markets

The new business models typically compete with existing models, though the services may diverge over time. Online communications apps compete with legacy voice and SMS, but through rapid innovation have differentiated themselves from legacy services and have become platforms themselves incorporating machine learning and with developer APIs.

Monzo, a London based banking start-up, is mobile native and runs on the cloud (hosted by Amazon Web Services). Monzo's vision is that banking becomes a platform, offering integration with other services via APIs.[53] An enabler of innovative new services such as Monzo, and the evolution into a services platform, is the European Second Payment Service Directive which provides controlled access to customer account data.[54]

Conclusion

Platforms lower barriers to entry and help start-ups scale-up. This should be considered by policy makers in assessing the overall competitive impact of platforms, and in assessing the impact of prospective regulation.

[50] Merlin, *Merlin membership survey 2016: accelerating digital growth for independent music*, June 2016.
[51], Brynjolfsson, Hu, and Smith, *Consumer Surplus in the Digital Economy: Estimating the Value of Increased Product Variety at Online Booksellers*, 2003.
[52] The Guardian, *Buying houses in cash and selling millions: meet self-publishing's 'hidden' authors*, June 2017.
[53] Monzo, *The bank of the future will be a market place*, February 2016.
[54] The Economist, *New European rules will open up retail banking*, March 2017.

5. The role of platform governance

"Honesty is the best policy, when there is money in it" Mark Twain

Markets require governance

We are accustomed to markets operating within a set of laws and regulations laid down by the state (markets cannot exist without some basic rules), but markets themselves play a role in rulemaking. As John McMillan put it in "Reinventing the bazaar":[55]

> *"The platform for a market in large part evolves by trial and error. The mechanisms for transacting develop from the bottom up, via innovations made by the participants. Spontaneous evolution is the main driver of markets. Markets and government have an uneasy relationship. Markets coordinate the economy better than any centralised alternative; governments sometimes distort and even destroy markets. But help from the government is essential if the economy is to reach its full potential."*

McMillan set out five elements for a workable market platform: information flows smoothly; property rights are protected; people can be trusted to live up to their promises; side effects on third parties are curtailed; and competition is fostered. Historically governments facilitated these elements.

Whilst the role of market governance is as old as the bazaar, the internet and digital platforms have created global bazaars; and are changing the balance between market players and government in relation to market governance. Platforms can meet some of the requirements of markets - improving information flows, trust and competition; but may only partially fulfil others such as mitigation of third party impacts.

A complaint, or complement insofar as innovation is concerned, is that the new players are "lawless"[56] (though they are subject to horizontal law, including competition law). But a deeper concern, for some, may be that they are "law makers" – in terms of code versus law.[57] The fact that they may be law makers should not be a concern *per se*, but it does imply the need to reconcile code and law; existing laws and regulations may not have anticipated the role of software code and platform codes in market governance, while platforms' governance incentives may often be aligned with regulatory objectives, but not always.

Platforms provide governance

Adam Smith coined the term the "invisible hand" to describe the way that self-interest in markets can deliver positive collective outcomes. Platforms seek to satisfy those using their platform, and craft market rules accordingly – the visible hand of the market.

Just as competition is good at aligning producer and consumer interests, competition between platforms - and prospective platforms - drives innovation and evolution in relation to market governance. In relation to peer-to-peer platforms, an OECD study found that consumers trust peer platforms more than conventional businesses in the same market.[58]

Platforms may be able to implement more granular and demanding rules than is possible for offline regulators. On the other hand, statutory regulators may find it hard to assess

[55] John McMillan, Reinventing the Bazaar – a natural history of markets, 2002, Norton.
[56] The Economist, *Shredding the rules*, May 2015.
[57] Lawrence Lessig, Code: And Other Laws of Cyberspace, Version 2.0, 1999. Basic Books.
[58] OECD, *Trust in peer platform markets*, November 2017.

whether policy goals are being met in platform-governed markets.

Conventional law-based regulation is not, however, subject to competitive pressures (beyond challenges to the courts and the risk of loss of legitimacy and independence). Regulation therefore tends to become entrenched, to adapt slowly, if at all, and can come to serve the interests of existing producers rather than consumers.

To the extent that platforms provide governance, the desire to maintain an attractive market place, coupled with competitive pressures, promotes dynamic governance which is aligned with users' interests. As the former Chairwoman of the FTC noted:[59]

> *"A platform provider has strong incentives to make its platform as attractive as possible to maximize its value to participants." Edith Ramirez, Chairwoman, FTC*

However, where users' interests and societies' interests may diverge, for example in relation to costs and benefits external to platform participants, a public interest role for intervention may remain.

Platform based governance in practice

Peer-to-peer exchanges

Peer-to-peer or sharing economy platforms have succeeded in creating new business models – and new markets – in part by offering governance. As Cohen and Sundararajan (2015) noted:[60]

> *"…platforms should not be viewed as entities to be regulated but rather as actors that are a key part of the regulatory framework…For nonintermediated peer-to-peer exchange in the past, the primary solution to market failure was intervention by a government agency. But today, the existence of third-party platforms that mediate exchange fundamentally alters what the market is capable of providing on its own..."*

For example, Lyft, Uber, Careem and Ola not only bring drivers and customers together, but seek to address information asymmetries and public safety issues. Examples include known and recorded identities of drivers and passengers, tracked journeys, live route sharing with friends and cashless transactions.

Mobile, GPS and app-based ride hailing have changed what is feasible, and have enabled code to substitute for law and regulation. Both law and code are necessarily, but a different balance may be appropriate given what such new business models can address on their own. Algorithmic dispatch of drivers also avoids the problem of corruption in relation to payments from drivers to car dispatches.[61]

Yet transportation platforms such as Lyft, Uber, Careem and Ola have proved controversial – challenging existing market structures and established forms of regulation. Nevertheless, they must adapt as they face competition for drivers and customers. For example, voluntary tipping, waiting charges and greater transparency over customer ratings have been introduced, whilst they have collaborated with public transit authorities to extend transport services.[62]

What is challenging, and is typically thought of as the role of government, is addressing impacts on

[59] Edith Ramirez, *Speech at 42nd Annual Conference on International Antitrust Law and Policy*, Fordham Law School, October 2015.
[60] Cohen and Sundararajan, *Self-Regulation and Innovation in the Peer-to-Peer Sharing Economy*, University of Chicago Law Review Online, Volume 82(1), 2015.
[61] Pers comm. Former minicab drivers who are now Uber drivers and welcomed the absence of the need for favour and side-payments to get work via an algorithm rather than a human car dispatcher.
[62] Quartz, *Why it matters that Uber and Lyft are becoming more like public transit*, July 2017.

third parties and ethical issues. For example, Airbnb has instituted a complaint page for neighbours where Airbnb guests are noisy[63] and a non-discrimination policy for hosts[64]; whilst Google DeepMind has established an ethics board related to machine learning.[65]

Platforms may therefore have value driven and reputational reasons to address third party harm. However, government also plays a role in relation to third party impacts, for example, in relation to traffic congestion – though policies should be applied in a neutral manner between services provided in different ways, if they have the same third-party impacts.

Apps store policies and user security

Apps stores may reject or remove apps if they violate policies in relation to content standards, represent a risk to the security of users, compromise privacy or become out of date.

Apps stores publish guidance on the basis for app acceptance and removal. For example, Apple publishes a detailed guide for developers.[66] This includes a requirement that:

> *"Apps that collect user or usage data must have a privacy policy and secure user consent for the collection".*

Developers can also be removed from the Apple developer programme, for example, if:

> *"Developers that use their apps to surreptitiously discover passwords or other private data will be removed from the Developer Program."*

Google also offer security checks for apps – including those from third party stores – on devices with the Google Play Store installed.[67]

The battle against malware that may be disguised within apps is ongoing, and is likely to remain so. Just as the immune system and pathogens are engaged in a constant arms race, platforms need to adapt their policies and at times must remove apps without notice. For example, hundreds of apps were removed from Google Play in August 2017 after security researchers found that they were potentially harmful malware.[68] Legitimate apps have also been compromised.[69]

Apple and Google have different approaches and different policies, but both companies are seeking to offer an attractive platform for developers and users. Diversity is a healthy part of competition, and seeking a common approach may be counterproductive. To take the immune system analogy further, genetic and immune uniformity increases vulnerability. Industry has collaborated to improve security, whilst pursuing different business models and approaches.

Apps stores are more secure than a completely open environment. Nevertheless, they need to be able to adapt, and exercise discretion, in the arms race to protect users. Complete apps store policy transparency could prove counterproductive, and may not even be possible given the use of machine learning (which is to an extent a "black box") to scan apps and protect users.

[63] Airbnb, *Airbnb and your neighbourhood*.
[64] Airbnb, *Airbnb's Nondiscrimination Policy: Our Commitment to Inclusion and Respect*.
[65] DeepMind blog, *Why we launched DeepMind Ethics & Society*, October 2017.
[66] Apple, *App Store Review Guidelines*.
[67] Google, *Keeping you safe with Google Play Protect*, May 2017.
[68] Cloudfare, *The WireX Botnet: How Industry Collaboration Disrupted a DDoS Attack*, August 2017.
[69] Paloalto networks, *Malware XcodeGhost Infects 39 iOS Apps, Including WeChat, Affecting Hundreds of Millions of Users*, September 2015.

Going too far - the 'good thing' illusion

Some market characteristics are at times promoted by policy makers and others, on grounds that they are thought to necessarily be a 'good thing'. However, reality is usually more nuanced and a feature that might be good in some situations may not be efficient or pro-competitive in others.

Openness and interoperability

Openness and interoperability are at times promoted as inherently good for innovation and consumers, but what we observe in technology markets is a constant search for a combination of closed and open, integrated and non-integrated elements that maximises innovation and benefits for the whole ecosystem. As Hazlett *et al* commented:[70]

> *"The viability of an ecosystem depends, when network externalities exist, on critical mass, productivity, innovation, learning and cooperation. An ecosystem "manager" or "host" is also a critical success factor, especially in digital markets that require compatibility standards (coordination) and complementary services to achieve full functionality. Ecosystems allow, and benefit from, specialized niche players."*

Within an ecosystem, there is a constant search for the right level of openness and interoperability versus integration.[71] Some elements of the system need to be able to evolve independently of others, whilst other elements benefit from tighter integration. A system that is too interoperable may constrain innovation and suffer from the accumulation of legacy compatibility constraints. As Viber founder Talmon Marco put it: [72]

> *"You can choose to interoperate or innovate; you cannot do both at the same time."*

Apple has pursued a strategy of integrated hardware and software, but has opened – in a controlled manner – the system to developers. The huge success of apps was the outcome, whilst hardware-software integration has allowed step changes; for example, interface changes including the introduction of multi-touch and, recently, embedded machine learning and augmented reality (which work best if processor, sensor and software changes are coordinated).

Investment in creating a secure environment may also be necessary, before elements of a system can be opened to third party innovation. An example is "extensions" introduced in iOS 8 in 2014, which greatly increased the things third-parties could do whilst protecting end users and their data, for example when using third party keyboards.[73]

Google has pursued a different strategy, which also combines open and closed elements. Google has explored opportunities in relation to integrated hardware-software innovation, including the Pixel phone, and has an apps store which screens apps for security.[74]

Rather than thinking of open or closed, or interoperable or non-interoperable, as good and bad respectively, one needs to consider the context in terms of the whole ecosystem.

Transparency

Transparency is often a good thing, but not always. It is seen as a core principle of effective governance and has received much attention in

[70] Hazlett, Teece and Waverman, *Walled garden rivalry: the creation of mobile network ecosystems*, November 2011.
[71] Autorité de la concurrence and CMA, *The economics of open and closed systems*, December 2014.
[72] The Verge, *Alone together: will one messaging app rule them all?*, May 2013.
[73] Ars Technica, *Explaining iOS 8's extensions: Opening the platform while keeping it secure*, 2014.
[74] Ars Technica, *Android 8.0 Oreo, thoroughly reviewed*, April 2017.

the debate about platform governance, and particularly the role of algorithms.[75]

Transparency is considered in some depth, to illustrate that even what may be considered a low-level and uncontentious intervention must be considered against the backdrop of what is done commercially, and that going further involves difficult trade-offs. For example, the European cookie law, whilst well intentioned, has proved burdensome for website owners and users, with little if any gain; and is particularly problematic when browsing on smaller screen mobile devices.

The intended meaning and precise requirements of 'transparency' can be unclear. It has been construed as a route to 'neutrality' (in search engines' treatment of their own and competitors' services); to consumer protection (in platforms' use of user data); to 'fairness' (in the European Commission's 'fact-finding' exploration of platforms' business-to-business relationships with suppliers); and to 'accountability' (for example, with respect to algorithmic selection, curation and presentation of news and political speech).

Frameworks already exist in many areas which govern platforms, as they do any company. However, there is a risk that higher standards are applied to innovative firms and business models than to incumbents. The case for enhanced transparency must be made, not assumed.

Transparency can pose risks. It may expose trade secrets or sources of competitive advantage. It creates a risk of gaming, particularly if bad actors are motivated and better equipped to exploit it. For this reason, Google does not and should not publish detailed explanations of how Gmail spam filters work and Instagram should not explain how it calculates quality scores to elevate high-quality comments in users' feeds.[76]

The complexity and risks of transparency may become more apparent as machine learning advances, since the reason machine learning delivers a particular outcome may not be apparent or capable of being explained even by platform operators themselves. To assess the impact of machine learning algorithms, a different kind of scrutiny will be required, not of the algorithms themselves but of their objective functions, training data, validation processes and monitoring.

These are not arguments against transparency *per se*, but warnings against a default assumption that more transparency is always better. Transparency is good, except when it isn't.

Conclusion

The concept of platform 'ecosystems' reinforces the need for caution in terms of unintended consequences of change, and a wider view of competition which encompasses competition between competing ecosystems. Extending the biological analogy, changes to the environment can have subtle unintended harmful consequences for an entire ecosystem.

Two conclusions emerge for platform regulation. First, recognise the role of platform governance when deciding whether and how to intervene. Second, take seriously the risk of unintended consequences.

[75] Angela Merkel: *"Algorithms must be made more transparent, so that one can inform oneself as an interested citizen about questions like 'what influences my behaviour on the internet and that of others?' Algorithms, when they are not transparent, can lead to a distortion of our perception, they can shrink our expanse of information…The big internet platforms, through their algorithms, have become an eye of a needle which diverse media must pass through."* The Guardian, *Angela Merkel: internet search engines are 'distorting perception'*, October 2016.
[76] Wired, *Instagram's Kevin Systrom wants to clean up the Internet*, 2017.

6. Policy primer

Use of digital platforms brings a range of benefits, and have enormous potential in helping to transform the economy for the better. But it is early days, and digital platforms also raise new challenges. The challenge, however is not in simply extending existing rules from the old to the new; but in reconciling new forms of private market governance based on code and codes of conduct with existing law and regulation.

Keep what works, but don't assume existing sector specific rules work for new businesses

The internet, and digital platforms, support a global single market, and have given us new services and new ways of doing things.

This has worked with a backdrop of global internet governance, and general horizontal law including competition and consumer protection law at the national level. It has also worked with a range of specific regulation, including openness to cross border data flows and storage, intermediary liability protection and the country of origin principle in relation to audiovisual content in Europe.

Now there are calls in relation to a number of vertical sectors of the economy to apply existing regulatory frameworks to platforms. However, applying old specific rules to new technology and business models is seldom the right approach. Edith Ramirez again:

> *"…existing regulatory schemes tend to mirror, and perhaps even entrench, traditional business models and thereby chill pro-consumer innovation"*[77]

Old rules may be redundant or offer a poor fit with the new technology and market structure. As the European Commission put it in relation to the collaborative economy in its Communication on Online Platforms:[78]

> *"The collaborative economy is a good example where rules designed with traditional and often local service provision in mind may impede online platform business models."*

Rather, the response should be to focus on clearly identified problems, and to consider in the context of emerging technology and market structure. The Commission emphasised:

> *"the need to foster the innovation-promoting role of platforms requires that any future regulatory measures proposed at EU level only address clearly identified problems relating to a specific type or activity of online platforms in line with better regulation principles."*

Sometimes the old rules might be extended, but often either the old rules require reform or entirely different rules should govern the new and old technologies and business models respectively.

Whatever we do, let's be careful to keep what works. As the Economist put it:[79]

> *"Governments sometimes have good reason to claim sovereignty over the digital realm. They are responsible for national security and elected to uphold national laws. But their regulatory push threatens to create a "splinternet", with national borders reproduced in cyberspace. That would harm the internet's function as an open forum*

[77] Edith Ramirez, *42nd Annual Conference on International Antitrust Law and Policy*, Fordham Law School New York, 2015.
[78] European Commission, *Communication on Online Platforms and the Digital Single Market Opportunities and Challenges for Europe*, May 2016.
[79] The Economist, *Chaining giants*, August 2017.

where people can communicate freely and come up with new global products and services—which is precisely what made it great in the first place."

Distinguish competition concerns from other policy issues

Competition concerns are a distinct set of issues for which there is a well-established framework which applies to the whole economy, namely competition law and institutions.

The specific circumstances relating to platforms and data need to be assessed on a case-by-case basis, and the economic analysis required may be complex and involve new considerations.[80] However, should competition problems arise, competition policy is the appropriate tool to address them. It offers a stable framework, yet is able to adapt should platforms raise specific issues that are in some sense novel.

General horizontal frameworks, including competition law, may be more robust to innovation than sector specific regulation. The reason for that is that they are based on enduring principles which are interpreted in relation to specific circumstances on an *ex post* basis.

Competition authorities also have a clear focus on consumers' interests in relation to competition, rather than the interests of any particular group of producers. Competition policy and wider policy questions, including industrial policy and distributional questions[81], should be kept separate.

Carefully scrutinise arguments in relation to fairness

An illustrative example of the distinction between competition policy concerns and other concerns is differentiation of services and prices offered to consumers, and the terms of trade between businesses. Both of these issues can arouse concern over fairness.

Differentiation of services and prices in relation to consumers can be efficiency enhancing, growing the market overall and benefitting in particular those with lower willingness to pay, for example, in the airline market. However, differentiation may also prove controversial. What is considered fair and unfair is subtle and depends on how differentiation is framed.[82] For example, Uber have utilised surge pricing to better match supply and demand, but have modified the approach over time to make it more transparent (showing the fare multiple) and acceptable (capping fare increases in an emergency).

Distributional concerns have also arisen in relation to business-to-business relationships. These are also not unique to digital platforms, for example, concern has arisen in the UK that supermarkets may have had excessive buyer power. However, provided there isn't a competition problem it is in general preferable to let market participants come to their own arrangements regarding terms of trade. If there is a competition problem, then that should be addressed through competition law.

If, as has been suggested in Europe, specific provisions were introduced governing 'fairness' in relation to business-to-business relations, then it is not clear why these should not be general horizontal provisions governing the entire market – including platforms and other business models and online and offline businesses. However, concern should only arise where there is a competition problem, and new rules are not required in such instances.

[80] Alex Chisholm, *Online platform regulation*, October 2015; Monopolkommission, *Competition policy: The challenge of digital markets*, June 2015.
[81] Herbert Hovenkamp, *Antitrust policy and inequality of wealth*, October 2017.
[82] Arvind Narayanan, *Price Discrimination and the Illusion of Fairness*, January 2013.

Protect consumers not producers, workers not jobs

The beneficiaries of innovation are consumers and citizens, and we should maintain a clear focus on their interests, rather than producer interests.

Confronted by new platform-based services, existing producers may seek to protect the *status quo*, and the *status quo* is unlikely to be compatible with innovation and growth.

Growth involves the reallocation of jobs, so we should protect workers not jobs. Existing institutions, including labour market policies and income redistribution may be sufficient; though new approaches should also be assessed if existing approaches are insufficient, for example, lifetime skills training, adapting labour market rules and new forms of income support.

As with sector specific rules, some categories of horizontal law may also need to change. Jean Tirole, in "Economics for the Common Good" discusses the debate over employed versus self-employed status which has arisen in the context of peer-to-peer platforms, when current law was conceived with factory employees in mind: [83]

> *"…legislators often try and fit new forms of employment into existing boxes, and to raise questions in similar terms: Is an Uber driver an employee or not?"*
>
> *"In my view, the debate goes nowhere. Any classification will be arbitrary, and will no doubt be interpreted either positively or negatively depending on one's person prejudices about these new forms of work."*
>
> *"One thing is certain, we will need to rethink our labor laws and the whole work environment (training, retirement, unemployment insurance) in a world of rapid technological and organisational change."*

Labour market law is more specific than competition law, and existing legal categories may not fit new forms of work and the ongoing need to protect workers, but not jobs. Labour market law is also more country specific than competition law and practice, so any required changes will be country specific.

Recognise the role of code and self-regulation in governing markets

Code itself, and platform policies, are an alternative form of governance to law and externally imposed regulation. This should be considered in deciding whether, and how, to regulate.

The fact that alternative codes and policies compete and adapt is also a virtue of this form of governance, in contrast to legislation and regulatory institutions which tend to work on longer time scales and face less direct incentives in relation to the interests of market participants.

Consumer interests are represented, and mechanisms for consumers to provide feedback on service providers are a common feature of platforms.

However, in areas such as the balance between content removal and free speech, it may be inappropriate to outsource regulation without clear guidance or, at a minimum, transparency requirements. Legitimacy and political accountability are core considerations.

Accommodate private regulation

Code and platform policies may mitigate problems such as information asymmetries in markets, reducing the need for specific regulation.

However, market governance by platforms presents a challenge to the orthodox top-down

[83] Jean Tirole, *Economics for the Common Good*, 2017, Princeton University Press. Pages 420-421.

approach to regulation, as Joshua Gans (2015) put it:[84]

> *"Uber and Airbnb are in fact some of the most regulated ecosystems in the world. They have massive regulations that would make any would-be bureaucrat proud. The problem is essentially that we have a compatibility issue between the public and private regulations…"*

The key thing is to take account of private regulation in deciding what, if any intervention is required, and to work with platforms if additional measures are considered necessary.

A further implication is that one would not expect uniform regulation – a "level playing field" – to be consistent with an equivalent level of consumer protection; since the level of private market governance is likely to vary between platform and non-platform based services.

In specific verticals, application of existing specific rules to new business models may not be appropriate, and even if revised the rules may need to differ between old and new business models i.e. it is not simply a case of levelling regulation up or down. For example, information problems resolved by app based ride hailing may persist for conventional taxi services[85]; whilst the call termination monopoly applying to legacy voice does not apply to communications apps.[86]

Apply established standards

There is a tendency to set a higher standard for new technology and business models than existing technology and business models. This tendency, at least initially, should be resisted to facilitate adoption and transition, provided the new technology offers the prospect of better outcomes.

The Pareto principle – the idea from economics that provided someone is better off and no one is worse off, then welfare is improved - can be applied to technology transitions. The aim should be to impose a standard that ensures that outcomes are at least as good as they were previously.

The idea has been applied to telecoms network transitions, where a regulated "anchor product" may be required, but equivalent to what was previously available even though the new technology offers improved service.[87]

The approach could be applied more generally. For example, in relation to autonomous vehicle systems which rely on machine learning, there has been a degree of a policy vacuum as to how they should be governed and how ethical considerations should be weighed up. Yet we have existing standards and frameworks which apply to human drivers. In principle, the same standards could be applied. The relevant question is can the autonomous system match the human standard, not is it perfect.

Just as we do not enquire into the ethical trade-offs a human would make in different scenarios (in any case, it is not clear that we would have a way of doing so), we should restrict ourselves to testing whether an autonomous system can meet the existing human standard of performance.[88] One could think of this as a 'Regulatory Turing Test' in which, if a human tester would have given a system a pass ignorant of the fact that it was not a human, that would be sufficient.

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[84] FTC, *Workshop Transcript - The "Sharing" Economy: Issues Facing Platforms, Participants, and Regulators*, June 2015.
[85] Gerardin, *Principles for regulating Uber and other intermediation platforms in the EU*, October 2017.
[86] Brian Williamson, *Deconstructing the "level playing field" argument – an application to online communications*, May 2017.
[87] Brian Williamson, *Anchor product regulation – a new regulatory tool*, Info, Volume 16(5), 2014.
[88] This approach addresses the first order issues, though differences may necessitate consideration of other issues, for example, what an autonomous vehicle should do in the event of an accident. Waymo, *Waymo Safety Report On the Road to Fully Self-Driving*, October 2017.

Further, whilst we should be alert to biases that an AI may acquire from training data, humans are not only subject to bias, but make 'noisy' decisions which vary for the same 'input'[89] and may make corrupt decisions i.e. a decision inconsistent with intended objectives and outcomes based on direct payment. Our assessment of the *status quo* standard, against which to compare alternatives, should be realistic.

The same principle might be applied to other systems, including editorial, recognition and filtering systems – the aim should not be perfection but human standards, or better.

For example, news aggregators should be held to 'procedural accountability' rather than substantive content obligations.[90] Good governance might require aggregators to have clear routes for users to complain about content, policies about content review and removal, and opportunities for recourse – but not to publish their curatorial strategies, explain why and how particular content and sources are surfaced, or release the algorithms that underpin those so-called 'editorial' choices – just as news publishers don't.

We should build as much flexibility into regulation as possible. Where rule making can be left to platforms who are responsive to participants' needs, this has the advantage of allowing the approach to adapt quickly – without requiring a change in the law.

Beware of hubris, consider unintended consequences

Dialogue with those who understand the market - and own the code - is key to identifying possible unintended consequences early on, and avoiding them. Examination of other national markets, where developments may have occurred earlier, can also offer insights regarding outcomes and possible unintended consequences of regulation.

Online security provides examples of potential risk in relation to unintended consequences, including the risk to introducing flaws in whole system security,[91] slowing the capability to react to newly identified vulnerabilities (which may require immediate removal of apps or changes to terms and conditions without usual due process) and changes - including transparency requirements - that open scope for gaming of security, rankings and content moderation.

Vulnerability introduced into one area may also extend to others, for example, end-to-end encryption is used to protect communications and e-commerce which are increasingly integrated in apps including iMessage, Facebook Messenger and WeChat. It may not be possible to open encrypted systems to a single agent without risking opening them to others[92], and opening one element of a system may allow access to other parts.[93]

Regulation may also raise entry barriers and the costs of scaling a new platform. Additional regulation could therefore have the unintended consequence of entrenching the position of existing platforms and reducing competitive pressure.

An example of possible unintended consequences is the possibility that regulation chills socially beneficial online dialogue and information sharing. The Economist pointed to

[89] Digitopoly blog, *Kahneman on AI versus Humans*, September 2017.
[90] Mark Bunting, From editorial obligation to procedural accountability: content regulation in the era of information intermediaries, Oxford Internet Institute (forthcoming).
[91] This can include non-obvious vulnerabilities and interactions. For example, third party hardware repairs could introduce parts that open software vulnerabilities. Ars Technica, *Replacement parts installed by repair shops contain secret hardware that completely hijacks the security of the device*, August 2017.
[92] Abelson *et al*, *Keys Under Doormats: Mandating insecurity by requiring government access to all data and communications*, July 2015.
[93] Cory Doctorow, *The FBI wants a backdoor only it can use – but wanting it doesn't make it possible*, February 2016.

this risk in relation to the balance between security and liberty:[94]

> *"As in the offline world, legislators must strike a balance between security and liberty. Especially after attacks, when governments want to be seen to act, they may be tempted to impose blanket bans on speech. Instead, they should set out to be clear and narrow about what is illegal—which will also help platforms deal with posts quickly and consistently. Even then, the threshold between free speech and incitement will be hard to define. The aim should be to translate offline legal norms into the cyber domain."*

> *"Before legislators rush in, they also need to think about unintended consequences. If internet firms are threatened with fines, they may simply remove all flagged content, just in case. Regulation that requires lots of staff to take down offensive posts will most hurt small startups, which can least afford it."*

Consider soft-power ahead of regulation

Nudge, transparency and self or co-regulation are one step removed from imposing regulation; and should be considered ahead of regulation. These options require communication and signalling to work, and dialogue should come first. However, even these 'soft-power' techniques can involve unintended negative consequences if not carefully thought through – a point illustrated earlier in relation to transparency.

Nudge

A nudge might involve signalling the need for change, but leaving the initiative with industry to find a solution.

A nudge may simply require greater awareness of a problem, and though outrage may play a role and the threat of regulation is implicit, we should follow due process and weigh the facts. The attention focused on ranking algorithms[95] and funding of political advertising are both examples in this category.[96] The former was brought to Facebook's attention following investigatory work by ProPublica (an independent, nonprofit newsroom), who showed that it was possible to pay for targeted posts alongside, for example, anti-Semitic categories.[97]

The latter case also shows that in complex systems, unintended outcomes can be expected. Individuals, groups and even nation states will seek out vulnerabilities and exploit them. The measure of success may therefore be adaptation to prevent future harm, rather than the complete absence of harm, particularly when the costs of action required to eliminate harm are vast and risk preventing innovation. In such situations – Facebook's finding that Russian sources funded divisive ads during the US Presidential election campaign is a good example - legitimacy may therefore require greater assurance and transparency regarding procedures for identifying and responding to unanticipated harm. Facebook subsequently announced enforcement and transparency initiatives in relation to ads.[98]

Transparency

Notwithstanding the limits to the value of transparency considered in the previous section, transparency can be a powerful tool –

[94] The Economist, *Tech firms could do more to help stop the jihadists*, June 2017.
[95] Sheryl Sandberg, *Facebook post*, 20 September 2017.
[96] Facebook Newsroom, *Facebook to Provide Congress With Ads Linked to Internet Research Agency*, September 2017.
[97] ProPublica, *Facebook Enabled Advertisers to Reach 'Jew Haters'*, September 2017.
[98] Facebook Newsroom, *Improving Enforcement and Transparency of Ads on Facebook*, October 2017.

but we need to be clear as to transparency of what, and why.

Frank Pasquale has argued for 'qualified transparency' – "limiting revelations in order to respect all the interests involved in a given piece of information."; and for 'intelligibility'.[99] Others have suggested 'accessibility and comprehensibility'[100], 'explainability'[101] or 'auditability'.[102] Or to put it another way, the regulatory question is not 'transparency how?' but 'transparency of what?'

At least five varieties of transparency can be distinguished:

- Transparency of code – as discussed in section 5, this is subject to risks, and may become meaningless as machine learning becomes prevalent.
- Transparency of design – the creation of platform systems with properties that can be independently verified without revealing underlying data or code, for example platform objective functions, or that the platform operates in a non-discriminatory way.[103]
- Transparency of policy – the goals and objectives of platform design, community rules and terms of use, standards and sanctions.
- Transparency of process – clarity about how platform policies are designed and decisions made.
- Transparency of outcomes – definition, measurement and reporting on success and other relevant metrics.

Many companies make voluntary transparency commitments across several of these levels. Facebook's modifications to the news feed to address concerns about 'fake news' have elements of transparency of policy and of design.[104] Its announcement that it would display all political adverts paid for by an advertiser, on the advertiser's page, is a form of transparency of outcomes.[105]

The transparency reports now published by many companies on government information requests, and their responses to them, are also characteristic of transparency of outcomes.[106] Apple's guidance to apps store developers display transparency of process.[107]

Self and co-regulation

Self and co-regulation is an established approach that can help bridge the gap between public policy objectives and market outcomes when more explicit or 'command and control' style regulation might not work well.[108] It leaves scope with market participants as to how they deliver the desired outcome, subject to oversight.

An example is the UK Code of Practice on Search and Copyright,[109] a negotiated agreement in an area where trade-offs were required to get to a good outcome (the agreement took 4+ years to reach). Shared objectives were agreed, as were metrics to assess progress in implementation of the Code. The Code includes redacted elements, presumably to protect commercial confidentiality and/or prevent gaming.

Private regulation can also be extended, allowing increased scope for innovation "without

[99] Frank Pasquale, The Black Box Society, Harvard University Press, 2015
[100] Turilli & Floridi, *The ethics of information transparency*, L. Ethics Inf Technol (2009) 11: 105.
[101] Horvitz, *Reflections on Safety and Artificial Intelligence*, presentation to Exploratory Technical Workshop on Safety and Control for AI, Carnegie Mellon University, June 2016.
[102] FAT/ML, *Principles for Accountable Algorithms and a Social Impact Statement for Algorithms*.
[103] Joshua Kroll, *Accountable Algorithms*, 2015.
[104] Facebook, *News Feed FYI: Addressing Hoaxes and Fake News*, December 2016.
[105] Facebook, *Facebook to Provide Congress with Ads Linked to Internet Research Agency*, September 2017.
[106] Access Now lists 68 companies that have released transparency reports as of late 2016, covering over 90 countries.
[107] Apple, *App Store Guidelines*.
[108] Ofcom, *Identifying appropriate regulatory solutions: principles for analysing self- and co-regulation*, December 2008.
[109] *Code of Conduct for Search and Copyright*, February 2017.

permission" through policies that are clear enough for third parties to apply them on their own, without having to seek agreement on a case-by-case basis. The US Food and Drug Administration (FDA) has set out proposals along these lines in relation to digital health devices:[110]

> *"we are considering whether and how, under current authorities, we can create a third party certification program under which lower risk digital health products could be marketed without FDA premarket review and higher risk products could be marketed with a streamlined FDA premarket review. Certification could be used to assess, for example, whether a company consistently and reliably engages in high quality software design and testing (validation) and ongoing maintenance of its software products."*

Apply lessons from tech to policy

The tech sector has developed ways of moving fast, and not breaking everything. There are lessons, which policy makers can adopt.

Sandboxes

Sand-boxes are tools for firms and supervisors to explore how regulation should be interpreted and applied in view of a firm's new solution, through running live tests.[111] Sandboxes allow entrepreneurs to try new approaches, and have been applied, for example, in relation to FinTech.[112]

The fact that such approaches may be more developed in relation to FinTech also suggests that institutional arrangements that encourage learning across different areas of sectoral regulation may be valuable.

A/B testing

Internet companies routinely run multiple versions of services to see how consumers respond. This powerful technique is known as A/B testing. In contrast, policy makers tend to adopt new policies and apply them to a whole country or region.

Policy uniformity has benefits since it allows businesses to scale without having to adapt to different regulations, but it reduces the opportunity for learning what works best, and may prevent new technologies and business models from ever emerging.

An example of an intermediate approach, which seeks to preserve scope for regulatory innovation whilst recognising the benefits of harmonisation, is that adopted by the US Department of Transportation in relation to development of a Federal framework for autonomous vehicles.[113] The approach includes identifying best practices from around the country and offering technical assistance to state legislatures. In other words, nudging regulators towards a common approach, whilst leaving room for innovation at the State level. Planned large-scale policy experiments could also be conducted, to decide and refine policy.[114]

Where responsibility for market governance can be left with platforms, this allows different approaches to compete within the same market. For example, the commercial terms and consumer protections applied in the Apple apps store and Google Play stores evolve in competition with one another and in response to consumer and developer needs. Different approaches to privacy protection, over which individuals may have different preferences,

[110] FDA, *FDA Voice Blog: Fostering Medical Innovation: A Plan for Digital Health Devices*, June 2017.
[111] Sandboxes are mainly supervisory tools for firms and supervisors to explore how regulation should be interpreted and applied in light of a firm's new solution, through running live tests. European Commission, *Public consultation on FinTech: a more competitive and innovative European financial sector*, March 2017.
[112] Financial Conduct Authority, *Financial Conduct Authority provides update on regulatory sandbox*, June 2017.
[113] US Department of Transport, *A Vision for Safety: Safer Roads through Vehicle Automation*, September 2017.
[114] Muralidharan and Niehaus, *Experimentation at Scale*, October 2017.

may also develop, subject to minimum requirements in law.

Consider global solutions for global problems

In response to the global nature of the internet, and the benefits from freedom to trade goods, services and data across borders, a number of global initiatives have been put in place or considered. These include:

- Internet Watch Foundation, an independent not for profit organisation working with the global internet industry and the European Commission, whose mission is to remove all child sexual abuse images online.
- Technology companies have worked together to create the Global Internet Forum to Counter Terrorism.[115] The companies will work together to refine and improve joint technical work, such as the Shared Industry Hash Database; exchange best practices as we develop and implement new content detection and classification techniques using machine learning; and define standard transparency reporting methods for terrorist content removals.
- A proposal by Alibaba Group Executive Chairman and Founder Jack Ma for an electronic world trade platform (eWTP) that would help SMEs overcome complex regulations, processes and barriers that hinder their participation in global commerce.[116]
- A proposal by Microsoft for a Digital Geneva Convention[117] that would include a set of binding agreements between nations backed by a tech sector accord and supported by an independent attribution organization to identify wrongdoing.[118] The aim, in common with the existing Geneva convention, is to limit the impact of (cyber) hostilities on civilians and civilian infrastructure.

These initiatives are likely to be more effective, and preferable to, national initiatives in addressing global challenges.

Reconcile code and law

At a high-level, three approaches are proposed: align law with code; align code with law and dialogue and disclosure.

Align law with code: The incentive on platform owners to meet the needs of all platform participants will tend to align code with the interests of consumers and other platform participants. This, coupled with other general law and regulation, may be sufficient. In that case existing sector specific law and regulation should be reviewed to ensure it does not overlap with the governance achieved by code. The approach to legacy technology and business models may, or may not, need to change (it might change, for example, if the original motivation for regulation was a lack of competition and platform based entry has increased competition).

Align code with law: Wider social costs and benefits which are external to platform participants may justify intervention, as such costs and benefits may not be taken into account by platform owners. An example might be funding of political campaigns, though it may be that transparency is sufficient to align code with law. However, in considering the imposition of regulation both the expected costs and benefits of intervention and the possibility of adverse unintended consequences should be assessed. One should first do no harm.

Require disclosure: In a range of circumstances disclosure of platform policies may be appropriate, short of aligning code with law.

[115] Twitter, *Global Internet Forum to Counter Terrorism*, June 2017.
[116] Alibaba, *Electronic World Trade Platform*, 2016.
[117] Microsoft, *The need for a Digital Geneva Convention*, February 2017.
[118] Microsoft, *Growing consensus on the need for an international treaty on nation state attacks*, April 2017.

Disclosure must be sufficiently general so as not to undermine privacy, confidential commercial information or information which would allow bad actors to game the platform.

The task is not trivial, as digital will touch every part of the analogue economy, and more often than not we are likely to find the old rules are not fit for purpose. The prize for those prepared to undertake the journey will, however, be large.