A New Deal for Big Tech: Next-Generation Regulation Fit for the Internet Age

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EXECUTIVE SUMMARY

Western politics is in turmoil. What started as a backlash against globalisation after the 2007–2008 financial crisis has spawned populist movements that are contesting the basic tenets of established liberal democracies more aggressively by the day.

A new approach to regulating technology companies will deliver stronger accountability and more freedom to innovate. Bureaucratic regulation designed for legacy industries is a poor fit for the pace and scale of the Internet; a fresh start is the best way to align private incentives with the public interest.

Technology is central to the challenge ahead because it defines the operating environment for today's politicians and policymakers. Navigating a good route through this space is not easy: the Internet has changed the structure of markets in fundamental ways, and introduced new and difficult policy trade-offs that have no obvious solutions.

A policy framework designed for the offline world served people well for many decades, and some hard-fought exemptions held things together long enough for the early Internet to flourish. But today, with technology reaching into every aspect of daily life, people frequently struggle to reconcile their mental models of how things ought to work with the reality of the modern economy.

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THE IMPACT OF THE INTERNET

The key to understanding what has happened lies in the economics of the Internet. Firms built for the Internet enjoy significant economies of scale and strong network effects. This gives rise to new business models:

- **platform companies** whose core product is the foundation for an ecosystem of other products and services;
- **aggregators** that leverage a superior customer experience to breeze past old models based on controlling distribution; and
- **infrastructure businesses** that replace costly, fixed assets with affordable and scalable services.

The companies that have harnessed these fundamentals have enjoyed astonishing growth and taken the commanding heights of the modern economy. Along the way, technology has stripped traditional gatekeepers of their power, delivered real progress for consumers and businesses, and increased many freedoms. But it has also brought significant economic upheaval and heightened cultural pressures, along with huge unknowns about the future. Most importantly, technology has concentrated power in the hands of a relatively small number of companies that all too often wield it clumsily and without sufficient legitimacy.

All of this comes at a time when the West's lead on technology is facing a clear and present challenge from determined Russian aggression and a concerted push from China to take a global lead in AI. This makes moving past the tech backlash more urgent than ever.

A NEW GENERATION OF REGULATION

Bureaucratic regulation designed for legacy industries is a poor fit for the pace and scale of the Internet. A new approach, based on stronger accountability coupled with more freedom to innovate, is the best way to align private incentives with the public interest.

The cornerstone of this approach is a new generation of regulator that can take an expert view of the activities of big tech companies. Whereas traditional regulators adopt a preventive approach based on rules and permissions, this next-generation regulator would take an enabling approach based on values and accountability. And whereas traditional regulators deal with narrow and well-defined domains, a next-generation regulator must deal consistently with the common themes arising in any market upended by the Internet. It must take an international outlook, have technical expertise comparable with the big tech companies and be fluent in the same fundamentals of Internet-scale operations, speed, data and innovation.

Such a next-generation regulator would have a three-part remit: to ensure tech companies take their responsibilities seriously, to ensure consumers understand the technology in their lives, and to rewrite obsolete rules for the Internet age.

Responsibilities for Tech Companies

The regulator's first task is to help the big tech companies meet their obligations to act in the public interest, and hold them to account when they fall short. It should require big tech companies to:

- **develop community standards** in consultation with users, governments and civil society;
- **enforce these standards** consistently and report on exceptions; and
- **consider the best interests** and well-being of users and society when setting strategy.

The regulator should have terms of reference that enumerate the values and responsibilities that society expects big tech companies to live up to, and the power to audit their policies and conduct inquiries into matters of public interest. It should also have the power to sanction companies for reckless or negligent behaviour; this should include options to issue directions and impose meaningful financial penalties.

Better Understanding for Consumers

The regulator's second task is to ensure that the customers of big tech companies understand what they are signing up for, and that this is consistent with what actually happens. It should require big tech companies to:

- **develop tools for users** to search, control and export data shared with a service;
- **provide straightforward summaries** of what else they observe about their users; and
- **give users clarity** about how a service is paid for.

The regulator should require additional transparency about what third parties are doing, to corroborate the information and explanations provided to users. This means giving users access to archives of third-party content that targeted them as well as global access to archives of political and other non-commercial content.

Institutional Reform

The regulator's third task is to remove old-fashioned rules that make it hard for big tech companies to do the right thing, and rewrite others so they remain effective.

The complexity of modern technology, and big tech companies' unique vantage point over the ecosystems around them, means that the most acute insights into problems and potential ways forward often lie with the companies themselves. The regulator should therefore:

- **be empowered to create safe harbours** where firms can develop and test solutions to economic and social challenges; and
- **make recommendations** about the repeal or reform of obsolete rules that inhibit innovation or the public interest.

Big tech companies will always be tempted to use their considerable resources to consolidate their power and outmanoeuvre governments. The regulator should therefore:

- **be required to approve acquisitions** of potentially competitive start-ups by big tech companies, with a presumption that these

will not be allowed unless there is a compelling public-interest case to the contrary; and

- **have the power to place big tech companies** in an alternative corporate-tax regime that allocates profits geographically in proportion to active users, as a stopgap pending more comprehensive international tax reform.

Implementing this programme will not be easy. A values-based approach, and the blurring of the boundary between corporation, regulator and community implicit in these proposals, is a radical departure from the old model of policymaking. But it is essential for establishing a way forward that is compatible with the new reality of the Internet.

INTRODUCTION

Western political leaders face an external environment characterised by disruption and rapid change, which people of all backgrounds are struggling to make sense of. Against that backdrop, leaders have a choice: ride the anger or find the answers. Right now, the anger is winning.

What started as a closed-minded turn against globalisation is now being compounded by a backward-looking turn against technology. This is a matter more of convenience than of principle. For populist movements to maintain momentum, they need to continually find new scapegoats; big tech, with its reverence for disruption and its West Coast elites, fits the bill for stoking resentment on both the left and the right. But it is not immaterial: knee-jerk reactions do more harm than good, and framing much of the debate as a confrontation obscures massive potential to apply technology to help solve some of today's most pressing policy challenges.

There is no question that the tech sector has brought much of the current firestorm on itself. There have been serious misjudgements and real failures to empathise and communicate. But politicians and policymakers are complicit too: all businesses operate in a legal and political framework, and successive governments across the West have looked the other way or sought quick fixes rather than doing the hard work of fundamental reform of policy and regulation for the Internet age.

Although the consumer Internet era began in the mid-1980s with the first mass-market home computers and the first commercial Internet service providers, it took until the late 1990s to establish some of the policy norms required to resolve the early conflicts that arose from, or were exacerbated by, widespread use of the Internet.

These norms charted territory that is now very familiar: intermediary liability exemptions that protected online services against users posting illegal content; data protection and privacy regulations designed to ensure that personal information was handled properly; and antitrust decisions that checked anti-competitive behaviour by large software companies.

However, these rules were also grounded in a narrow view of the Internet and what technologies built on top of it might be capable of. So while the first debates about the Internet acknowledged an unusual degree of scale as a result of its global nature (the record industry would not have pushed so hard against early music-sharing services if there had not been a lot of money at stake, for example), ultimately policymakers regarded the Internet on a par with the many other more traditional sectors of the economy competing for their attention.[1]

Today, the Internet is not just another sector: it has escaped into and disrupted all of them. This rapid and near-total transition from niche to ubiquitous has left two significant problems. First are obsolete rules across the board that no longer achieve their objectives—and are often hijacked by vested interests to try to defend the status quo. Second is an inability to craft new rules because the mental models used for policymaking are based on a bygone era.

To find a sustainable solution, policymakers need to understand how the world has changed. The truth is, the Internet has changed everything—and not in the way people usually mean. Yes, it manifests itself in the astonishing devices in people's pockets and the apps they use on a daily basis, but to navigate the world of policy and find the right answers on regulation, the economics are what really matters.

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1 David Kravets, "Dec. 7, 1999: RIAA Sues Napster", Wired, 7 December 2009, https://www.wired.com/2009/12/1207riaa-sues-napster/.

ORIENTATION

The traditional framework for analysing the economy is familiar ground for policymakers. When markets are functioning well, competition between firms delivers productive and allocative efficiency; policy focuses on addressing the market failures that inhibit this—externalities, public goods, incomplete markets and imperfect competition—to improve social welfare.

The diagnoses and policy prescriptions flowing from this framework have served policymaking well for many decades. But today policymakers are struggling to reconcile their mental models of how things ought to work with the reality of the modern economy. For example:

- Firms that capture a significant share of a market are usually expected to damage consumer welfare by restricting supply and driving up prices, but many of today's big tech firms focus on abundance for consumers and low price points.
- Markets are traditionally divided into consumers and producers, and regulated accordingly, but many of the most disruptive tech businesses are more accurately described as intermediaries or marketplaces than as producers in the classical sense.
- Consumers are expected to look out for themselves by making rational and informed decisions, but the ramifications of using many tech-based products and services are not well understood, and consumers' relationships with them can be complicated.

This dissonance arises because the traditional policy framework is built for a world that is predominantly offline. For as long as the Internet remained a niche pursuit, this was not a major problem: curiosities arising from it were easily ignored or dealt with by ad hoc fixes. In the modern world, however, this is neither desirable nor politically sustainable.

The starting point for a contemporary analysis of the economy that can address the challenges facing today's policymakers is the ubiquity of the Internet. This has enabled a dramatic migration of economic activity and value creation from the physical to the online world. In turn, this has fundamentally changed the nature of

production—not just for the big tech firms that tower over the modern economy, but for everyone.

In particular, many of the costs that drive business decisions and consumer behaviour are dramatically lower in an information economy with instant, global connectivity. This includes:

- **Production costs**: The non-rival nature of information-based products and services means that once the main development work is completed, there is little or no cost to produce an incremental unit, which makes economies of scale much more likely.
- **Transaction costs**: The Internet makes it much easier to determine what is available in the market, compare different options, and establish the relationships and exchanges required for transactions to take place with little or no friction.
- **Distribution costs**: When products and services are delivered online, firms can largely avoid having to hold and manage inventory, or having to ship it from one place to another, and can reach huge numbers of customers regardless of physical proximity.

Taken together, these shifts towards low or zero marginal costs weigh heavily on the strategy of any individual firm operating in today's business environment. And as every firm grapples with them at the same time, they have driven major changes in the balance of power both within supply chains and between producers and consumers. This has altered incentives and recast the structure of markets in ways that often run counter to conventional economic wisdom.

With such massive and disorienting changes across every sector of the economy, it can be tempting to revert to a simplistic narrative of old economy vs. big tech. There is, however, significant diversity among the big tech businesses, not only in terms of the sectors they operate in, but also in their strategic motivations and underlying business models. Any sensible policy response must therefore be founded on a proper and nuanced understanding of the dynamics of different industries and the players within them.

KEY CONCEPTS

In thinking about the impact of the Internet on the economy, three important concepts have taken on increased significance and are essential to understand: platforms, aggregators and infrastructure. What follows are stylised descriptions—none is a literal or complete description of any individual company, and many large tech businesses reflect aspects of more than one of them (in fact, this is where the hardest problems can arise). But together, these concepts help illuminate the strategic behaviour of both tech companies and the incumbents they often go up against, and have wider implications for the long tail of businesses that make up the rest of the economy.

Platforms

Platform businesses are based on building and distributing a common architecture on top of which other products and services can exist independently, each prospering through its own relationship with end users. Familiar examples in the tech world include:

- operating systems that provide a computing environment on which other applications can be executed, such as Windows *(https://www.microsoft.com/windows)* , macOS *(https://www.apple.com/macos/)* and Linux *(https://www.kernel.org/)* ;
- video-game consoles, where the operating system and hardware are usually tied closely together, such as PlayStation *(https://www.playstation.com/)* , Xbox *(https://www.xbox.com/)* and Nintendo Switch *(https://www.nintendo.com/switch/)* ;
- mobile operating systems for phones and tablets, like Android *(https://www.android.com/)* and iOS *(https://www.apple.com/ios)* ; and
- smart home voice assistants like Alexa *(https://developer.amazon.com/alexa)* , Siri *(https://www.apple.com/siri/)* and the Google Assistant *(https://assistant.google.com/)* .

Many of these platforms have achieved staggering global scale. Google has reported over 2 billion active Android devices worldwide; Apple has announced over 1.3 billion active devices; and Microsoft has stated that 700 million devices run Windows 10.[2] Smart speakers are the newest category here: sales to date are in the tens of millions, but the market for these devices is growing extremely fast.[3]

In all of these cases, consumers buy into the platform because it is the prerequisite for using various third-party products and services in its wider ecosystem. Consumers' relationship with the software, apps or products that run on top of the platform is typically separate from the purchase of the platform itself. The inherent qualities of the platform matter, but the ecosystem itself is usually the main factor driving a decision to opt for one platform over another. This means that platform businesses have a strong incentive to support third parties and to try to lock in consumers.

The platform concept is not new: one could think of cars as a platform for accessory manufacturers and service providers. But the Internet has intensified the economics of platform businesses by making it easier to attain critical mass among consumers and upgrade standards much more regularly. That erodes the cliff edges in performance and capabilities that used to encourage customers to switch from one platform to another.

Aggregators

American technology analyst Ben Thompson introduced the aggregator concept in his work on strategy and technology.[4] This

2 Ben Popper, "Google announces over 2 billion monthly active devices on Android", The Verge, 17 May 2017, https://www.theverge.com/2017/5/17/15654454/android-reaches-2-billion-monthly-active-users; "Apple Reports First Quarter Results", Apple press release, 1 February 2018, https://www.apple.com/newsroom/2018/02/apple-reports-first-quarter-results/; Frederic Lardinois, "Microsoft says nearly 700M devices now run Windows 10", TechCrunch, 7 May 2018, https://techcrunch.com/2018/05/07/microsoft-says-700m-devices-now-run-windows-10/.

3 "Amazon Echo, Google Home Installed Base Hits 50 Million; Apple Has 6% Market Share, Report Says", Forbes, 2 August 2018, https://www.forbes.com/sites/johnkoetsier/2018/08/02/amazon-echo-google-home-installed-base-hits-50-million-apple-has-6-market-share-report-says/.

4 "Aggregation Theory", Stratechery, accessed 28 September 2018, https://stratechery.com/concept/aggregation-theory/.

report uses a slightly more accommodating version of his framework that keeps the basic principles intact but focuses more on the headline concept than on the precise boundary of the definition.

Aggregators have a business model based on owning the relationship with the end user in a particular category, which they achieve by focusing their efforts on providing a superior user experience. Although price may be an aspect of this, other factors like discovery, personalisation and reduced friction are typically more important. Familiar examples in the tech world can be grouped into three types.

First are services that connect users and the content they share, which puts a premium on presenting compelling content quickly and easily. Examples include:

- search services like Google Search *(https://www.google.com/)* , Yelp *(https://www.yelp.com/)* and TripAdvisor *(https://www.tripadvisor.co.uk/)* ;
- social sharing services like Facebook *(https://www.facebook.com/)* , Instagram *(https://www.instagram.com/)* , Twitter *(https://twitter.com/)* , LinkedIn *(https://www.linkedin.com/)* , Reddit *(https://www.reddit.com/)* , YouTube *(https://www.youtube.com/)* and Twitch *(https://www.twitch.tv/)* ;
- messaging services like WhatsApp *(https://www.whatsapp.com/)* , Messenger *(https://www.messenger.com/)* and Snapchat *(https://www.snapchat.com/)* ;
- dating services like Tinder *(https://tinder.com/)* and Bumble *(https://bumble.com/)* ; and
- question-and-answer communities like Stack Exchange *(https://stackexchange.com/)* and Quora *(https://www.quora.com/)* .

Second are services that provide an entry point to collections of digital content, where the transition to digital storage and delivery alters the economics in favour of bundles and subscriptions. Examples include:

- audio services like Spotify *(https://www.spotify.com/)* , Google Play Music *(https://play.google.com/music)* , Apple Music *(https://www.apple.com/music/)* and Amazon Music *(https://music.amazon.com/)* ;
- video services like Netflix *(https://www.netflix.com/)* , Hulu *(https://www.hulu.com/)* and Amazon Prime Video *(https://www.primevideo.com/)* ; and
- publication services like Texture *(https://www.texture.com/)* , Readly *(https://readly.com/)* and Kindle Unlimited *(https://www.amazon.com/kindleunlimited)* .

Third are services that facilitate point-in-time transactions, where the Internet reduces friction and makes it possible to trust counterparties by intermediating the relationship. Examples include:

- marketplaces for sellers, like Amazon *(https://www.amazon.com/)* , eBay *(https://www.ebay.com/)* and Etsy *(https://www.etsy.com/)* ;
- ride-hailing services like Uber *(https://www.uber.com/)* and Lyft *(https://www.lyft.com/)* ;
- active-transport services like Bird *(https://www.bird.co/)* , Lime *(https://www.li.me/)* , Ofo *(https://www.ofo.com/)* , Mobike *(https://mobike.com/)* and Jump *(https://jumpbikes.com/)* ;
- property-rental services like Airbnb *(https://www.airbnb.com/)* and HomeAway *(https://www.homeaway.com/)* ;
- food-delivery marketplaces like JustEat *(https://www.just-eat.com/)* , Deliveroo *(https://deliveroo.com/)* and Uber Eats *(https://www.ubereats.com/)* ;
- marketplaces for tools or tasks, like Fat Llama *(https://fatllama.com/)* , TaskRabbit *(https://www.taskrabbit.com/)* and Airtasker *(https://www.airtasker.com/)* ; and
- money-transfer services like Venmo *(https://venmo.com/)* and TransferWise *(https://transferwise.com/)* .

The scale of these services is such that numbers of users are often comparable with the populations of entire countries (or even continents). Large social networks count active users in the billions,

while leaders in many other categories count paying users in the hundreds of millions.[5]

Aggregators typically leverage technology to support multisided markets on a scale that would not otherwise be possible. In all of the cases above, the companies' primary focus is to be the consumers' first choice in their particular category. This puts a huge premium on delivering a user experience that is compelling and as simple as possible. By taking control of the demand side of the market, these firms can displace incumbent competitors and attract suppliers on terms that are favourable to the aggregator. This means that aggregator businesses have a strong incentive to attract and retain users, and to try to commoditise suppliers.

The aggregator concept is a direct outgrowth from the Internet. Previously, the best strategy for most businesses operating in offline markets was to differentiate themselves from competitors and capture a profitable segment of the customer base. But with marginal costs, transaction costs and distribution costs eliminated, the addressable market is the entire world, and the best way to defray predominantly fixed costs is not to settle for a niche, but to capture as much of the market as possible.

Infrastructure

Infrastructure businesses are based on selling services that are more attractive than building, owning and operating the underlying assets, and are focused predominantly on business customers. Familiar examples in the tech world can again be grouped into three categories.

First are developer-focused cloud computing services that replace on premises equipment with different degrees of abstraction. Examples include:

- Infrastructure as a Service offerings, such as AWS EC2 (https://aws.amazon.com/ec2/) , Google Compute Engine (https://cloud.google.com/compute/) , Azure VMs (https://azure.microsoft.com/services/virtual-machines/) ;

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5 Josh Constine, "Facebook now has 2 billion monthly users. . . and responsibility", TechCrunch, 27 June 2017, https://techcrunch.com/2017/06/27/facebook-2-billion-users/.

- Platform as a Service offerings, such as AWS Elastic Beanstalk *(https://aws.amazon.com/elasticbeanstalk/)* , Google App Engine *(https://cloud.google.com/appengine/)* , Azure App Services *(https://azure.microsoft.com/services/app-service/)* ; and
- other variants like Containers as a Service, for container-based computing, and Functions as a Service, for serverless computing.

Second are business-focused cloud-computing services that replace applications running on local machines with software delivered over the Internet. Examples of Software as a Service include:

- productivity software like Office 365 *(https://products.office.com/)* and G Suite *(https://gsuite.google.com/)* ;
- collaboration tools like Slack *(https://slack.com/)* , Box *(https://www.box.com/)* and Zoom *(https://zoom.us/)* ;
- project-management tools like Trello *(https://trello.com/)* , Asana *(https://asana.com/)* and Jira *(https://www.atlassian.com/software/jira)* ;
- business-operations tools like Workday *(https://www.workday.com/)* , Coupa *(https://www.coupa.com/)* and Expensify *(https://www.expensify.com/)* ; and
- customer-relationship management (CRM) tools like Salesforce *(https://www.salesforce.com/)* and Zendesk *(https://www.zendesk.com/)* .

Third are business-focused operations solutions that can satisfy other business requirements via a service-based model. Examples of so-called Anything as a Service include:

- website and e-commerce services like WordPress *(https://wordpress.com/)* and Shopify *(https://www.shopify.com/)* ;
- communications services like SendGrid *(https://sendgrid.com/)* and Twilio *(https://www.twilio.com/)* ;
- task and project services like Amazon Mechanical Turk *(https://www.mturk.com/)* and UpWork

(https://www.upwork.com/) ;
- business process automation services like UIPath
  (https://www.uipath.com/) and Blue Prism
  (http://www.blueprism.com/) ;
- payments services like Stripe (https://stripe.com/) and PayPal
  (https://www.paypal.com/) ;
- advertising services like Google Ads (https://ads.google.com/)
  and Facebook Ads (https://www.facebook.com/business/
  products/ads) ;
- warehousing and logistics services like Fulfillment by Amazon
  (https://services.amazon.com/fulfillment-by-amazon/
  benefits.htm) and ShipWire (https://www.shipwire.com/) ; and
- workspace services like WeWork (https://www.wework.com/) .

Services marketed to business users will always have a lower profile than big consumer brands, but scale and global reach is still a distinctive feature for infrastructure businesses. WordPress is estimated to power nearly a third of all websites.[6] Stripe processes billions of dollars a year in payments.[7] Hundreds of millions of people use general-purpose productivity software, and even narrower services delivered over the Internet still count end users in the millions.

In all of these cases, services are typically charged on a pay-as-you-go basis—for example, by the number of users or monthly usage—and are easy to scale up or down as required. This often compares favourably with traditional alternatives, for which investment must be allocated upfront and capacity is fixed.

Infrastructure businesses have the most parallels in the pre-Internet world: consumers are used to arranging power, water and phone services from a utility company rather than building their own power plants, reservoirs and telecoms networks. The difference in the online environment is that there is little or no cost to reach a

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6 Paul Sawers, "WordPress now powers 30% of websites", VentureBeat, 5 March 2018, https://venturebeat.com/2018/03/05/wordpress-now-powers-30-of-websites/.

7 Ashlee Vance, "How Two Brothers Turned Seven Lines of Code Into a $9.2 Billion Startup", Bloomberg Businessweek, 1 August 2017, https://www.bloomberg.com/news/features/2017-08-01/how-two-brothers-turned-seven-lines-of-code-into-a-9-2-billion-startup.

new customer, so the issues relating to duplication of physical networks in traditional sectors are less relevant, and in many cases customers serve themselves rather than requiring expensive ongoing relationship management. Moreover, infrastructure businesses are constantly increasing in scope, as technology enables more and more activities to be shifted seamlessly to external providers.

BROADER CONSEQUENCES

Thanks to these three concepts, it becomes much easier to make sense of the changes in the economy that are causing so much difficulty for political leaders and policymakers. Three phenomena in particular are worth exploring in more detail: the decline of traditional gatekeepers, the rise of the zero-stack start-up and the era of the superstar tech firm.

The Decline of Traditional Gatekeepers

Before the Internet, access to customers in many markets was typically gated by a small number of incumbent firms with control over the means of distribution. These firms were often in a position to leverage this control to restrict supply or protect insiders, and had to segment the customer base because distribution costs made serving the whole market prohibitively expensive.

The Internet has turned this situation on its head. New models of economic organisation give everyone the ability to get in front of customers and audiences without needing to win favour from traditional gatekeepers to be granted access (see table 1).

Table 1: Old and New Ways of Carrying Out Common Tasks

Old Way (Before the Internet)	New Way (With the Internet)
Write a letter to your local newspaper	Share your opinion on social media
Write a letter to your	Post a comment on an MP's

Old Way (Before the Internet)	New Way (With the Internet)
member of parliament (MP)	homepage
Submit an article to an editor	Self-publish on a website or blog
Send a manuscript to a publisher	Self-publish on an online bookstore
Demo a track to a record label	Release promo tracks direct to fans
Pitch a script to a studio	Release a teaser trailer direct to viewers
Pitch a new product to an investor	Crowdfund from potential customers
Buy a taxi medallion	Drive with a ride-hailing service
Register a hotel or holiday let	Host with an accommodation service
Win shelf space in a retail outlet	Sell direct to consumers online
Obtain licences to write software	Write software based on open application programming interfaces (APIs)
Debate policy though formal party channels	Canvass opinions on social media
Stand for leadership at official hustings	Post a status update to your followers

Of course, the Internet has not eliminated gatekeepers altogether. But unlike past shake-ups in which traditional gatekeepers' fortunes changed relative to their peers (think the shifting balance of power among newspapers, or the rise and fall in

popularity of different television channels), the Internet has precipitated a far more extensive structural realignment.

The new gatekeepers are both fewer in number and oriented towards end users rather than suppliers, which means that—for better or for worse—consumers have far greater power when it comes to determining what ends up taking off.

The Rise of the Zero-Stack Start-Up

Before the Internet, starting a business in pretty much any industry was capital intensive and required a high tolerance for bureaucracy. But as the range of business capabilities that can be commoditised and delivered as a service has expanded, the cost of getting started has fallen significantly. Historically this applied most strongly in fields like design and development, but there are now many businesses dealing in real-world products and services that have benefited from the ability to get up and running without needing to commit a huge amount of money on day one.

A business that focuses ruthlessly on its core idea, with most or all of its supporting functions delivered by external service partners rather than internal capabilities, is sometimes described as a zero-stack start-up. This is an inversion of the full-stack concept common in the tech world, which describes a person, team or organisation able to do everything required to deliver a product. Zero-stack start-ups are viable thanks to an increasing range of scalable external services (see table 2).

Table 2: Scalable External Services Available to Businesses

Technology as a Service	Anything as a Service
Data storage	Warehousing
Computing	Payments and banking
Bandwidth	Logistics
Desktops	Office space

Technology as a Service	Anything as a Service
Applications	Marketing and communications
Artificial intelligence	Human intelligence

One particularly important aspect of this phenomenon is the interplay of frictionless scaling with the zero-distribution-and-transaction-costs nature of businesses built on the Internet. Small businesses that would never have been viable offline, because it was impossible to achieve a critical mass of customers in close geographic proximity, are a completely different proposition when companies can reach everyone on the planet affordably and handle transactions with customers in different places easily and confidently.

The decline of traditional gatekeepers in the advertising field is a particular boon for start-ups. Traditional channels like print media and broadcast television are poorly targeted and far too cumbersome and expensive for the early days of most businesses. But self-service online advertising offers start-ups a highly cost-effective way to get their brand in front of the best prospects, along with far better abilities to generate direct responses and monitor effectiveness.

So as well as eroding the power of traditional gatekeepers at the customer end, the Internet has opened up the potential for far more people to make the economics of a small business work, by giving them the flexibility and scalability required to turn entrepreneurial ideas into substantial businesses that create wealth and jobs. At a time of growing concerns about automation and the future of work, and an increasing emphasis on the tasks that humans are uniquely suited to accomplishing, these sorts of reductions in barriers to small-business formation will only become more important.

The Era of the Superstar Tech Firm

The tech companies that are disrupting the traditional gatekeepers and enabling a new generation of start-ups are also an

interesting case in their own right. Although there are important distinctions between platforms, aggregators and infrastructure, there are also similarities that help explain why some of the most successful technology businesses are now also some of the most highly valued companies on the planet (see figure 3, which shows tech firms in blue and traditional companies in red).
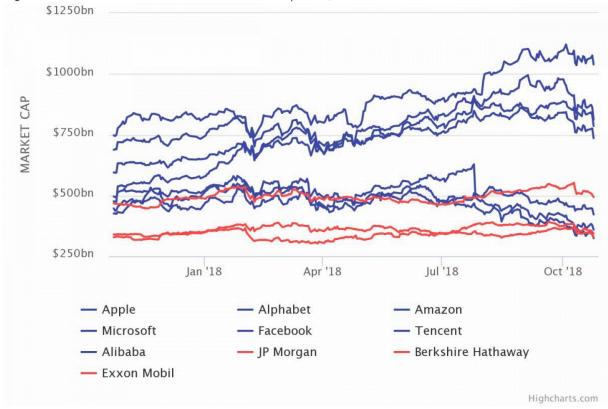
Figure 3: The World's Most Valuable Listed Companies, October 2017 – October 2018

The most important similarity is these firms' inherent cost structure compared with other businesses. The fundamentals of the Internet mean that the big companies built on it are typically characterised by large fixed costs and low (or zero) marginal costs, transaction costs and distribution costs. Consequently all tend to enjoy significant economies of scale: getting bigger by adding more end users means lower unit costs and higher margins.

On top of this, in many cases a cost structure that favours operating at scale is reinforced by network effects that operate on one or more sides of the market.

Direct network effects are immediately apparent in social networks, where the service is closely tied to the relationships between users and therefore becomes more useful for everyone as more people join. (The same is true for peer-to-peer services like file-sharing and Bitcoin.) There are also same-side network effects arising from the pooling of data across a growing user base, for example in delivering more useful search results or better personalised playlists.

Indirect network effects are present in many multisided markets like online marketplaces (buyers attract sellers, which expands selection, which attracts more buyers) or ride hailing (riders attract drivers, which lowers wait times, which attracts more riders). Markets can have multiple sides: when a service is free for consumers and supported by advertising, a busier network will be more attractive to the advertisers that want to reach its users.

Products or services that are exposed to both significant economies of scale and strong network effects are inherently expensive and technically challenging to scale up, but if this is achieved, they have the potential to be very successful. Along the way, those that grow the fastest will often attain a significant first-mover advantage against competitors, as unit economics moves in their favour and network effects drive customer acquisition costs down (at least to begin with).

Looking ahead, the biggest unknown in tech is the future of artificial intelligence (AI). The technical demands of cutting-edge AI research are already extreme and intensifying, to the point that the requirements for training new generations of deep-learning models are within the reach of only a small number of organisations. The leaders in the field include Western companies with extensive computing infrastructure like Google, Facebook and Amazon, as well as Chinese giants like Baidu, Alibaba and Tencent. As AI develops into a general-purpose technology with high-value applications across the consumer and commercial spheres, an early lead resulting from the data generated by operating at scale may be self-perpetuating.

In some respects this winner-takes-all tendency looks a lot like the natural monopolies of classical economics, but there is an important difference. Natural monopolies such as electricity or

water provision are often plagued by poor cost control and a lack of innovation that has a negative impact on consumers, and the cost of switching can be prohibitive. In the tech environment, by contrast, many firms stay relevant through a strong customer proposition that remains compelling and keeps the flywheel of network effects moving in the right direction, while the cost of switching can be trivial (and users commonly use more than one competing app).

This is not to say that superstar technology companies are entirely benign, or have no negative impacts on the wider economy. But the challenges that accompany them do not necessarily appear where they are usually expected—and so traditional policy tools and conventional wisdom are not always the best guide to finding solutions.

CHALLENGES

The policy dissonance outlined above can now be analysed in a different light. The analytical building blocks described earlier—the cost structure of the Internet; the distinction between platforms, aggregators and infrastructure; and the implications for gatekeepers, start-ups and tech giants—are essential for helping chart a way through. Returning to the examples highlighted in the previous chapter:

- For big tech firms, the priority is to achieve scale to defray a cost base that is mainly fixed. Making products inexpensive for end users is a good strategy; removing the friction of payments altogether by making them free for end users is even better.
- The Internet itself provides a different point of integration in the value chain, namely controlling the demand side of the market rather than owning supply and distribution. Big tech firms have built entire business models anchored on facilitating or coordinating markets.
- Technology is becoming increasingly sophisticated behind the scenes, while user interfaces are becoming simpler to broaden their appeal. This is driving a wedge between what people think is happening—if they think about it at all—and what is actually going on.

This world is very different from the one that traditional policy tools are designed for. And although it has brought tremendous benefits, it is undeniably overshadowed by a huge imbalance of power, and many of the trade-offs in public policy that made sense before the Internet need to be reassessed. The most urgent priority for policymakers is therefore to cut through the complexity and get the perspective required to make more informed decisions.

ECONOMIC UPHEAVAL

First, consider the big-picture impact of the technological revolution on the economy. There are many different measures of size of the digital economy, the pace at which it is growing, and the extent of technology sector ecosystems in different countries.[8] But

when it comes to thinking about the systemic impact of the Internet on the economy, zooming out reveals a number of important trends.

Disruption

Ever since American academic Clayton Christensen started writing about disruptive innovation, and entrepreneur Marc Andreessen coined the phrase "software is eating the world", the technology policy debate has been awash with talk of old industries being disrupted by new entrants with the Internet in their DNA[9].

Broadly speaking, disruptive innovations use technology to enable radically different business models that can outperform and unseat the established players. Christensen talked about disruptive innovation as the counterpoint to sustaining innovation: disruptive innovations start out by addressing a low-end part of the market that the incumbents have neglected, as opposed to incrementally improving an established offering.

Others offer a view of disruption that is more about creating a new market foothold—on one or more sides of a market—or creating new markets altogether, as is the case with many of the big tech firms. When successful, this can result in a business that is dramatically more cost efficient than the incumbents for a similar or superior feature set (and often eliminates major sources of rent seeking in the process). At that point, the shift from old to new can happen very fast.

These sorts of effects did not start with the arrival of the Internet. Personal computers were disruptive to the mainframe industry, and cellular phones were disruptive to fixed-line networks. But the cost structure of the Internet massively increased the

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8 "Tech Nation 2018", Tech Nation, May 2018, https://technation.io/insights/report-2018/; "Digital Planet 2017", The Fletcher School at Tufts University, July 2017, https://sites.tufts.edu/digitalplanet/dei17/; "The State of European Tech 2017", Atomico, November 2017, https://2017.stateofeuropeantech.com/.

9 "Disruptive Innovation", Clayton Christensen, accessed 27 September 2018, http://www.claytonchristensen.com/key-concepts/; Marc Andreessen, "Why Software Is Eating The World", Wall Street Journal, 20 August 2011, https://www.wsj.com/articles/SB10001424053111903480904576512250915629460.

ability of prospective disruptors to quickly reach a very large number of customers with a new product. This is most closely tied to the concept of aggregators—firms built to leverage the power that comes from delivering a superior customer experience—and the traditional gatekeepers are the ones most often on the sharp end of disruption.

This phenomenon has unlocked enormous amounts of value in all sorts of areas. Search, social media, messaging, ride hailing, retail, accommodation, music, television, app stores and auctions are all good examples of aggregators realigning the market around the customer relationship. In all of these arenas, consumers have enjoyed significant gains—few people would want to return to a world before they had these options at their fingertips.[10]

But at the same time, the incumbents have seen their hold on the markets they used to dominate significantly weakened. And while this may be good for consumers, for those on the losing end of disruption, talk of other peoples' gains is little consolation for the decline of a profession or the loss of a previously secure job—particularly when that profession took a lot of time and money to enter, or the job was the long-term anchor for paying the mortgage and supporting the children's education. These effects play out at a social level as well: the decline of local employers who were focal points for the community, of the newspapers that helped establish a factual baseline for political debate, and so on.

For many of those threatened by disruption, doubling down on old rules and regulations in an attempt to forestall change can be a rational response. But this often means pitching vested interests against consumers, and wrecks the potential for a proper debate about the real goals of public policy and how best to achieve them.

Of course, most changes in the economy—whether precipitated by innovation or by policy—create winners and losers. But never before has disruption occurred at a scale and pace that leaves the traditional safety nets and adjustment mechanisms so grossly ill equipped to address its effects.

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10 Laura Bliss, "Lyft Is Reaching L.A. Neighborhoods Where Taxis Wouldn't", CityLab, 29 June 2018, https://www.citylab.com/transportation/2018/06/lyft-is-reaching-la-neighborhoods-where-taxis-wouldnt/563810/.

Competition

Competition policy is a mainstay of the economics profession, and for good reason: in most markets, competition is the force that encourages markets without central control or direction to exhibit productive and allocative efficiency.

It is unsurprising, then, that the superstar technology companies set alarm bells ringing in the competition policy world. Their scale alone—whether measured by market capitalisation, revenues or customers—dwarfs many of the firms in traditional sectors that used to be considered giants of their industries. It certainly feels like they are in a position of significant power, and that this requires close scrutiny.

The challenge, however, is that traditional competition policy is not always properly oriented to interrogate and respond to the economics and business models of the Internet era.

In both the United States (US) and Europe, there is a substantial body of policy designed to prevent both collusion between rival firms and the abuse of dominant market positions. For the latter, the US approach to antitrust takes a particular interest in consumer welfare, where monopolies were historically synonymous with high prices and poor service, and enforcement is based on criminal law. The European approach to competition policy focuses more on innovation, where monopolies are seen as a potential risk to smaller competitors, with an administrative system for enforcement that penalises offending companies with fines.

Both are challenging to apply to large technology companies. The foundation of the model adopted by aggregators is to provide a superior experience that customers love and actively choose over the alternatives, which can make it hard to obtain purchase if the yardstick is consumer detriment. Breakout success can deliver huge returns, which makes it possible for firms to achieve significant organic growth as well as expansion via acquisitions. And most large technology companies owe their existence to aggressive innovation and have to recoup significant development outlays, so penalties risk becoming a deterrent to spearheading change, and regulatory burdens can hit smaller, less well-resourced firms hardest.

A big part of the problem comes from the tendency of many commentators to group all large technology companies together in their thinking about competition policy, when in fact different business models create different incentives for problematic behaviour:

- Platform operators have an incentive to try to lock in consumers to exercise pricing power, and to foreclose competition vertically by developing downstream products that have privileged access to their platform and hence a competitive advantage when going head to head with third-party alternatives.
- Aggregators are the opposite in many respects: they are successful because they meet customer needs. But once they are in control of demand, they risk gaining excessive power over other sides of the market, for example suppliers or advertisers. They also have an incentive to foreclose competition horizontally, either by exploiting economies of scope or by acquiring adjacent companies, to mitigate any dilution of their relationship with end users.
- Some types of infrastructure businesses have incredibly high fixed costs—particularly for the most general-purpose offerings that rely on global networks of physical assets like data centres and warehouses—that make it prohibitively expensive for new entrants to compete on a like-for-like basis. This means markets may be competitive but not contestable.

Crossover between different business models in the same company can create the most difficult problems of all. App stores layered on top of operating systems introduce an aggregator element into the platform model, and the insights this generates in terms of customer choices can be exploited to identify functionality provided by third-party products that can subsequently be made obsolete by new features in the underlying platform.[11] A similar dynamic applies to aggregators that open up their infrastructure as a service for other companies: third-party businesses bear most of the risk of taking a new product to market, while the aggregator benefits from the insights into what sells and

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11 "You've been sherlocked", Economist, 13 July 2012, https://www.economist.com/babbage/2012/07/13/youve-been-sherlocked.

has the potential use this to strengthen its own direct proposition to consumers.[12]

In addition to all of this, there is the aggressive acquisition mentality that has come to be associated with some of the largest and best-resourced companies. While scale is part and parcel of the Internet economy, and new firms typically focus relentlessly on growth, firms that are already large have an incentive to use synergies as a pretext for foreclosing threats from far smaller competitors. Some commentators talk about a "kill-zone" in which the big technology firms either acquire or crush start-ups before they can gain a foothold.[13] This introduces a different sort of constraint for entrepreneurs seeking funding—as even great product-market fit may not be anything like enough to survive—and may be a serious brake on longer-term innovation.

In worlds like these, many of the normal remedies are a poor fit. Looking at acquisitions through a pre-Internet lens can give a false impression that products occupy unrelated markets. Price controls and service standards have no purchase when products are already well liked and cheap (or free) for consumers. Horizontal separations—breaking up a service into parts that compete directly with each other—can be detrimental to users by limiting the scale that makes a service valuable. Vertical separations—disentangling businesses operating at different parts of the value chain—can eliminate sources of capital required to fund the major investments in fixed costs necessary for competition in different markets.

Some commentators looking at digital markets advocate increased interoperability of services. For example, perhaps different social networks should be required to facilitate cross-posting of status updates, just as regulated railways allow different train-operating companies to run competing rolling stock on the same tracks, and some postal services are required to carry competitors' packages. This makes a lot of sense in relation to the protocols that underpin the Internet itself, and has been the subject

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12 Lina M. Khan, "Amazon's Antitrust Paradox", Yale Law Journal 126, no. 3 (January 2017): 564–907, https://www.yalelawjournal.org/note/amazons-antitrust-paradox.

13 "American tech giants are making life tough for startups", Economist, 2 June 2018, https://www.economist.com/business/2018/06/02/american-tech-giants-are-making-life-tough-for-startups.

of much attention in the debate on net neutrality. But when it comes to consumer-facing services, the argument for interoperability presupposes a static environment in which products are well understood, so that customer harms can be worn away by competing providers each looking to be marginally more attractive than the next. This is a hard fit for the modern tech environment; even something as seemingly straightforward as a status update has evolved enormously in just a few years. In these cases, there is a real risk of limiting innovation and further consolidating the position of incumbent companies. The provision of application programming interfaces (APIs) that other services can interact with may be a better way forward, but even these need to be kept up to date and introduce new security challenges.

Ultimately, the nature of these markets, in which the main players already focus relentlessly on the consumer experience, means that the most important thing for competition and contestability is that the next truly disruptive innovation can be born and grow strong enough to survive the kill zone. Looking back, many leads that seemed unassailable were overtaken not by a competitor making marginal improvements but by a newcomer that looked at things in a way that the incumbent was simply not able to conceive.[14]

And in the space between the great waves of disruption breaking, scale looks to be an inevitable consequence of the very low marginal costs and very strong network effects present in the Internet economy. Of course, abuse of power should not be tolerated. But in many cases, scale is a direct result of getting things right. Policymakers may find more mileage in figuring out how best to live with scale and leverage its strengths, rather than fighting an endless battle to prevent it in the first place.

Work and Jobs

As traditional ways of organising businesses are overturned by the models made possible by the Internet, there are three big challenges relating the future of work. First, policymakers need to get to grips with technology outperforming people for a growing

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14 Jean-Louis Gassée, "The Windows Phone failure was easily preventable, but Microsoft's culture made it unavoidable", Quartz, 26 July 2017, https://qz.com/1037753/the-windows-phone-failure-was-easily-preventable-but-microsofts-culture-made-it-unavoidable/.

number of tasks, not only in industrial applications, but increasingly in service sectors as well. Second, for the growing number of participants who make money from digital marketplaces, the experience of work can be very different from traditional employment.

And third, as technology lowers the barriers to entry for starting a business, more people will strike out as entrepreneurs. Technology entrepreneur Nicolas Colin calls this the "entrepreneurial age": one in which work revolves around the networked individual rather than the traditional corporation.[15] A new safety net is required to help people enjoy the benefits and hedge the risks of a more dynamic jobs market in which more roles fall outside traditional employment. This includes independent contractors and freelancers, people on so-called zero-hours contracts, and other people who are called to work on only as required. Arrangements like these covered 21.4 million people in the US in 2017, accounting for almost 14 per cent of the country's total employment (see table 4).[16]

Table 4: Contingent and Alternative Employment Arrangements in the United States, May 2017

Type of Worker	Share of Total Employment	Number of People
Contingent workers (no implicit or explicit contract for ongoing employment)	3.8%	5.9 million
Independent contractors (including independent consultants and freelance workers)	6.9%	10.6 million
On-call workers (called to work only as needed)	1.7%	2.6 million

15 Nicolas Colin, "How to fix the welfare state for the entrepreneurial age", Financial Times, 28 May 2017, https://www.ft.com/content/a642d4ae-4169-11e7-82b6-896b95f30f58.

16 "Economic News Release", United States Department of Labor, Bureau of Labor Statistics, 7 June 2018, https://www.bls.gov/news.release/conemp.toc.htm.

Temporary-help agency workers (paid by a temporary-help agency)	0.9%	1.4 million
Workers provided by contract firms (employed by a company that provides them or their services to others)	0.6%	900,000

Source: US Bureau of Labor Statistics

Start with automation. This is part and parcel of technological progress, and the Internet is not a prerequisite—think robots improving productivity on assembly lines, or subway trains running without drivers. Today, however, the intersection of advances in artificial intelligence and the capacity to deliver services over the Internet means that a far wider range of activities is in scope.

This is particularly clear in the world of infrastructure businesses. What started essentially as an information and communication technology (ICT) proposition—tools and technology without the hassle of managing servers or installing updates, and scored as operational expenditure that can be financed out of revenues—has since developed into one that provides an attractive alternative for executing a range of tasks that were previously carried out by professionals. The application of automation and artificial intelligence to functions like human resources, finance, facilities, sales and customer support means that businesses can perform at the same level but with fewer staff. As capabilities increase, more functions will go the same way.

This automation of professional functions is at the heart of many of the businesses that were born on the Internet. In particular, for the aggregators that are built to handle rapid user growth, a high degree of automation is required to manage operations at scale, from auctioning ads and organising news feeds to arranging bookings and processing payments. But reliance on algorithms and data-driven decision-making, and the requirement for liquidity in many marketplaces that are designed to support huge numbers of participants, also changes the nature of work for the people who participate in them.

To a large extent this is the flip side of aggregators prioritising the consumer experience, with suppliers conforming to the system that enables this. So drivers working on ride-hailing apps are allocated trips by an algorithm rather than negotiating with a radio operator, and sellers in a retail marketplace list their products using a standard template rather than differentiating themselves through their brand. More creative fields are not immune: the primary unit for music has shifted from the album to the track, just as the focus in journalism has moved from the publication to the article.

Although traditionalists often bemoan the decline in traditional jobs, or write off new forms of work as something they would not want for themselves, it is important to remember that there are real upsides as well as challenges. The decline of gatekeepers means that many industries are no longer a closed shop, which can be particularly relevant for minority groups and those looking for work. Marketplaces coordinated by algorithms can increase fairness by reducing the scope for badly behaved actors to exercise their prejudices. Technologies like online shopping can shift some activities from consumers to workers as well as lifting productivity, with the result that work in fulfilment centres can pay more than traditional retail roles.[17] The flexibility that comes with making money from marketplace environments can suit many people, including those with caring responsibilities or wanting to work part time.

There are two important considerations to set against this. The first is the question of whether firms that derive their power from controlling consumer demand can exercise this excessively on other sides of the market. In the arena of work and jobs this may present as monopsony, a situation in which there are lots of suppliers but only a small number of buyers. So, if someone has chosen to make a living in a particular type of digital marketplace, and there is no comparable alternative, then they have little leverage over the terms on which they participate. Combined with making an unpredictable amount of money from week to week, this can be a

17 Michael Mandel, "How E-Commerce Is Raising Pay And Creating Jobs Around The Country", Forbes, 3 April 2017, https://www.forbes.com/sites/realspin/2017/04/03/how-e-commerce-is-raising-pay-and-creating-jobs-around-the-country/#6183c7f86dff.

precarious situation for those who do not have access to ways to hedge against new forms of risk.

The second is the need that many people have for work to provide meaning and context for themselves, their families and the community around them. Work that is reduced to a sequence of straightforward tasks, and where relationships are atomised into short-lived and abstractly quantified interactions between suppliers and customers, may feel liberating to some but lack meaning to others.

Both of these factors call for a reassessment of how public policy treats different forms of work. It seems clear that technology has opened up new types of work, and that there are aspects of these new options that people value, as well as areas where they fall short. As markets continue to evolve, approaches will be needed that protect innovation and flexibility while ensuring that people obtain the security and good work they deserve.

Finally, for a small but important number of people, the ultimate alternative to traditional work is to strike out as an entrepreneur and build a new business entirely.[18] As described earlier, the Internet has massively reduced the upfront investment required to get started, by delivering technology as a service rather than as something you build, own and manage. It has also made it possible to run a far leaner operation, as software and artificial intelligence increasingly substitute for staff in many functions. The financial and operational barriers to starting a business have never been lower.

What technology cannot do, however, is teach people the mindsets and soft skills required to weather the ups and downs of entrepreneurship. So as more people consider entrepreneurship as a route that could provide security for their families and meaning in their working day, and as financial and practical barriers continue to fall, there will need to be a far greater emphasis on the training and support mechanisms required to help people make this option work.

Inequality

18 Larry Alton, "Are Millennials More Or Less Likely To Start Their Own Businesses?", Forbes, 15 February 2017, https://www.forbes.com/sites/larryalton/2017/02/15/are-millennials-more-or-less-likely-to-start-their-own-businesses/.

Economic policy ought to be concerned with equity as well as efficiency, because for society to prosper and for progress to be sustainable, the gains from economic growth must be both secure and shared fairly. Distributional questions are therefore tightly bound up with the broader economic impact of the Internet.

On one level this is a story about concentration. When economies of scale and network effects give rise to superstar technology firms, the value created ends up concentrated in a relatively small number of companies. The market capitalisation of those at the top now makes up a significant share of the corporate universe—and an even greater proportion of recent growth. To the extent that shares in these firms are listed and widely held, this is not such an issue, but the technology sector exhibits some important differences from many other parts of the economy.

First, many founders and early employees hold significant equity in technology firms and stay in post for far longer than executives in other industries, going on to become extremely wealthy on an individual basis. Second, more firms are choosing to wait longer before listing their shares, which excludes the wider public from participating in their growth.[19] And third, most technology firms have a relatively low headcount compared with their revenues or customer base, so productivity and remuneration for employees in general tend to be far higher than for their counterparts in other parts of the economy.

In many respects this is not a new phenomenon. The industrialists at the helm of the large corporate empires of the late 1800s and early 1900s made huge fortunes; and at every turning point from one era to another, those with the right insights, drive and timing have an opportunity to build very successful businesses.[20] The difference now is that a globalised world both opens up far larger markets for companies to occupy and draws an even starker contrast between those at the top and everyone else. So at a time when populist resentment of distant elites is gaining ground, the

19 Katie Roof, "IPOs are back, but for how long?", TechCrunch, 23 March 2018, https://techcrunch.com/2018/03/23/ipos-are-back-but-for-how-long/.

20 Chase Peterson-Withorn, "From Rockefeller to Ford, See Forbes' 1918 Ranking Of The Richest People In America", Forbes, 19 September 2017, https://www.forbes.com/sites/chasewithorn/2017/09/19/the-first-forbes-list-see-who-the-richest-americans-were-in-1918/.

words and actions of high-profile figures in tech carry increased weight.

Beyond the fortunes of founders themselves, the wealth generated by successful tech companies can bring huge prosperity to cities and regions, particularly those that manage to develop clusters of growing firms or attract significant new investments. For example, there has been vigorous competition among cities across the US and Canada to host Amazon's second headquarters.[21] But the divergence with the wider economy can also result in stark inequality in places where tech companies are present, with knock-on effects on everything from transport and housing to local amenities and public services.

Tax

Beyond the winner-takes-all effects that arise from the economics of the Internet, there is also a difficult debate about whether Internet-era businesses are competing on a fair basis with their old-world counterparts. This is a separate discussion to the one about disruption and innovation: whereas that was about new business models and new ways of organising markets, the contention here is that the primary difference is exploiting technology to gain an unfair advantage, in particular in relation to tax.

There are two issues for policymakers to confront: one of substance, and one of understanding. On the substance, the rise of superstar technology companies with operations across many countries has exacerbated a pre-existing problem with corporate taxation in a global economy.[22] In the old world, when firms had a far more obvious physical footprint and point of sale, it was relatively easy to allocate activity and profits to different jurisdictions. But because so much of the value created by tech companies is bound up in services and intangibles, and because it can be genuinely difficult to ascribe where an online transaction

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21 Nick Wingfield, "Amazon Chooses 20 Finalists for Second Headquarters", New York Times, 18 January 2018, https://www.nytimes.com/2018/01/18/technology/amazon-finalists-headquarters.html

22 "Corporate tax and the digital economy: position paper", UK government closed consultation, 22 November 2017, last updated 13 March 2018, https://www.gov.uk/government/consultations/corporate-tax-and-the-digital-economy-position-paper.

took place, it is far easier for companies that do business over the Internet to realise profits in lower-tax jurisdictions.

No one country can solve this issue on its own. Substantial, coordinated reform of corporate-tax regimes has typically eluded the international community but is becoming more important by the day. Nevertheless, even if the ideal set of reforms is not possible, it ought to be possible for a subset of leading economies to come together and improve the status quo. For too long, when it comes to corporate-tax reform, the best has been the enemy of the good.

More broadly, the very different business models of the Internet—of platforms, aggregators and infrastructure—frequently trigger misunderstandings when it comes to assessing how companies behave. Online marketplaces have little need for a retail presence, so the spaces they use for logistics tend to be out of town, where business rates are lower, rather than in town centres, where space is at a premium. Companies that invest heavily to support future growth can make zero or negative profits and hence face a low tax bill, even if their unit economics are in the black, but this does not necessarily mean they have an unfair advantage. Suppliers in multisided markets may not be taxed as if they were employees of the company whose app they are working on, but it remains their responsibility to pay tax on their earnings.

Some of this misunderstanding is not entirely innocent, and perpetuating it can be an effective tactic for incumbents struggling to compete on other dimensions. But having a meaningful debate about tax reform means moving beyond simplistic assertions that tech companies are somehow outside the rules that apply to other companies, or that it is reasonable to expect executives to sort out problems that stem from structural failings in the tax code itself. In the end, the difficulties in talking about the impact of tech on the economy are a stark reminder of how hard it is to make sound policy in a changing world.

CULTURAL PRESSURE

Now consider the impact of technology on society. There have always been those who tend to favour a nostalgia-tinged past over the present, or the known quantity of the present over an uncertain future. The debate about the Internet can seem relentlessly negative, but there are many good reasons to be optimistic about the future, and technology will have an important role in helping achieve a fairer and more just society. Nevertheless, technology has also created new social challenges without obvious solutions, and policymakers need to engage with these constructively to move forward.

Privacy

In the consumer sphere, much of the current backlash against big tech has revolved around the question of privacy. Consumers generate huge quantities of data in the process of interacting with digital products and services—and yet, despite having so much of the world's information at their fingertips, people often have little insight into what other people or companies know about them. This makes for fertile ground for outrage when things go wrong (or when there is a gap between what consumers expected to happen and what they have actually given permission for).

The biggest difficulty for policymakers to address is the concept of privacy itself. Implicit in much of the public debate, and reflected in various attempts to tighten rules and regulations, is a notion of privacy as something that is fully separable from other considerations and should take precedence over them.

Of course privacy is extremely important, and of course people should be free to exercise their right to privacy. But the complexity arises because even privacy is a trade-off.

This was true before the Internet: you sacrifice some of your privacy every time you leave your home. The difference is that in the past it was relatively easy to judge the costs and benefits. And although the picture started to change as technologies matured—think store cards that track your purchases in supermarkets, or closed-circuit television that can read and log

vehicle registrations—most people had a sense of control over what was going on and understood why things were the way they were.

In the online world, and in the space occupied by aggregators in particular, things are very different. The digitisation of relationships is central to the delivery of products and services that win on customer experience, because digital relationships generate huge amounts of data. This can be pooled across users, to learn about what works, and used to build detailed profiles of individual users, to provide an experience personalised to them.

Digitisation also significantly tilts the balance of information compared with the offline world, and can pose a serious risk if the huge quantity of data about consumers that companies hold is not properly secured. And companies do know an awful lot: what people search for, what posts they like and share, where they have been, what they buy—the list goes on.[23] Meanwhile, around the Internet, sprawling networks piece together a picture of which websites people have visited and which apps they have installed.[24]

Advertising is often the place where people can feel the most uncomfortable. But contrary to the dominant narrative, most tech companies are not selling people's data: this would be tantamount to giving up one of their main sources of competitive advantage.

Figuring out the right balance in relation to privacy is hard, however, particularly when there is rising concern about the homogenisation of culture. Yes, the black box of digital advertising can feel invasive, especially when ads follow you around the web. But it has also enabled countless new businesses to get in front of customers they would never otherwise have found. This is about more than cheap razors and avocado toast; for example, after decades of stasis, innovative new menstrual products are finally viable because their creators have been able to go direct to consumers.[25]

23 Radhika Sanghani, "I downloaded all my Facebook data and it was a nightmare", BBC, 21 June 2018, https://www.bbc.co.uk/bbcthree/article/93d1393a-1c12-485f-b7fe-5146cd48c12c.

24 Chris Yiu (@clry2), "Ever wondered *how* those adverts manage to keep on finding you - even when you go incognito, switch devices, or never actually searched for the product in the first place? Let us count the (many, many) ways [THREAD]", tweet, 7 June 2018, https://twitter.com/clry2/status/1004754363745734656.

One solution that has been talked about a lot is the idea of personal data stores. These offer a way to secure a person's data separately from the apps and services he or she uses, and to achieve very granular control over what is shared with whom. There are sticking points, however: the business model for companies taking this sort of approach is not clear, and many consumers may ultimately value the convenience of current apps over a system that imposes a far greater cognitive load in terms of curating and supervising all their data. Nevertheless, a new wave of efforts appears to be under way, including the Solid project led by Sir Tim Berners-Lee, inventor of the World Wide Web. This may yet make some headway in terms of changing the way web applications work.[26]

There is a similar tension in respect to the competition issues discussed earlier. In Europe, the General Data Protection Regulation (GDPR), which came into force in May 2018, goes a long way to upgrading outmoded data protection rules. But it explicitly prevents individuals from exporting their social graph—the map of who they are connected to—from one platform to recreate it on another.[27] This sort of bootstrapping was essential for many of today's big apps to get started, and the competition this fuelled kept everyone on their toes. The irony now is that locking data down too far may make the current incumbents unassailable.

Opacity

Questions of privacy are closely connected to others relating to opacity. If the privacy challenge was about whether big tech firms know too much about consumers, then the opacity challenge is about whether people know enough about what they are getting themselves into, both individually and collectively.

So many of the products and services integral to modern life pride themselves on being easy and intuitive. But behind the scenes

25 "A long overdue disruption in menstrual products", Economist, 31 March 2018, https://www.economist.com/business/2018/03/31/a-long-overdue-disruption-in-menstrual-products.

26 "One Small Step for the Web...", Tim Berners-Lee, September 2018, https://www.inrupt.com/blog/one-small-step-for-the-web.

27 "Guidelines on the right to 'data portability'", European Commission Directorate General for Justice and Consumers, 27 October 2017, http://ec.europa.eu/newsroom/article29/item-detail.cfm?item_id=611233.

they are built on a staggeringly complex set of interactions between technology, data and markets that few people see and even fewer fully understand. Abstracting away complexity like this is one of the real wonders of the modern world, but it also makes it hard to make genuinely informed choices about the technology that people interact with.

This is being driven by two powerful trends that pull in different directions. On the one hand, the capabilities of the underlying technology and the sophistication of the systems behind modern digital products and services are increasing rapidly. On the other, when it comes to the touchpoint with the user, there is a powerful drive towards making products simple, accessible and effortless for people to use. As a result, the complexity being abstracted by technology is significant, and this means consumers do not always have a full picture of what they are participating in.

Of course, pretty much all digital products and services come with long and obtuse terms and conditions—and a few more boxes for Europeans to tick thanks to GDPR, though stronger rights are necessary but not sufficient for informed choice. Yet this is a long way off what is required for users to have a good understanding of the relationship they have with technology.[28]

For some commentators, this opacity compounds other challenges arising from big tech: gathering the personal data on users required to execute targeted advertising may be far easier if consent is obtained in the least intrusive manner possible. It is certainly the case that a significant proportion of users have no real idea about how online advertising works. Research in the United Kingdom (UK) by tech think tank Doteveryone shows that many people do not understand how ads are targeted, and nearly half of people feel negatively about receiving them.[29] So-called dark patterns—carefully constructed interface elements that nudge users into choices they might not otherwise have made—make this starker still.

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28 "Terms of Service; Didn't Read", Terms of Service; Didn't Read, accessed 28 September 2018, https://tosdr.org/.

29 "People, Power and Technology: The 2018 Digital Understanding Report", Doteveryone, accessed 28 September 2018, http://understanding.doteveryone.org.uk/.

Opacity can also fuel discontent about the economic nature of the exchange between users and technology companies. Some argue that while people typically think of themselves as consumers of online services, they are actually unwitting workers toiling to produce and submit the data that make said services function.[30] From this perspective, opacity is a way for firms to forestall pressure to compensate users for their contribution to the bottom line.

This data-as-labour argument is not clear cut. Users of online services typically gain access to a service they value for little or no financial outlay, and in many cases they directly benefit when data enable services to be personalised or better anticipate their needs. And for individual users, the marginal value of their data is likely close to zero, as most insights arise once data are pooled. Nevertheless, there does seem to be a disconnect between how firms choose to talk about individual products and services, and the broader implications for how well consumers understand what is happening when so much of life is lived online.

Companies themselves have mixed incentives when it comes to talking about their business models and relationships with third parties. On the one hand, many services are more useful when people have good access to, and control over, the data they have provided; and straightforward explanations of how data will be used or why incidents occurred can build long-term consumer trust. On the other, the transformation of data-driven insights into a compelling user experience is a crucial and commercially sensitive differentiator for Internet businesses, and there is a legitimate concern that going too far in detailing how systems work may also make them easier or more attractive targets for malicious actors.

Ultimately, most consumers who sign up to a new service simply want to get on with using it, and most companies want to get as many people as possible through the conversion funnel, so it is unsurprising that neither side is particularly interested in an extended conversation about all the hidden complexity. Across repeated interactions, however, consumers seem to have acquired a

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30 Imanol Arrieta Ibarra, Leonard Goff, Diego Jiménez Hernández, Jaron Lanier and E. Glen Weyl, "Should We Treat Data as Labor? Moving Beyond 'Free'", American Economic Association Papers & Proceedings 1, no. 1 (forthcoming), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3093683.

massive information deficit that makes them apprehensive about their relationship with big tech and unable to make informed decisions about what services they sign up to and how they choose to use them.

The rapid advance of machine-learning systems and artificial intelligence looks set to make this challenge increasingly hard to manage. Compared with systems based on rules or simple statistical relationships, decision-making driven by deep learning algorithms can be much harder to explain in straightforward terms. That raises the prospect of structural asymmetries of information, because if the algorithms themselves are incapable of rendering explanations that make sense to humans, then there may be nothing meaningful to open up.[31] AI also raises a fresh set of ethical concerns: companies will need new tools and frameworks to make good decisions about where this sort of technology should (or should not) be applied. And countries will need a way to reach international consensus, lest rules in one part of the world are made irrelevant by technologies deployed from another.

Responsibility

The sophistication of many digital products and services—slick user interfaces, personalised experiences and instant gratification—also gives rise to questions about responsibility, both corporate and individual. One expression of this has been the movement to think about whether being so close to the Internet and mobile phones is "time well spent".[32]

This is particularly salient for products and services that are supported by advertising, where advertisers pay to get eyeballs on ads and convert them into user responses. Services have a number of avenues to increasing their advertising profitability: providing the functionality for more compelling ad experiences, increasing the ad load in the user interface, increasing the length of the average session and increasing the number of sessions.

31 Paul Voosen, "How AI detectives are cracking open the black box of deep learning", Science, 6 July 2017, https://www.sciencemag.org/news/2017/07/how-ai-detectives-are-cracking-open-black-box-deep-learning.

32 Casey Newton, "'Time well spent' is shaping up to be tech's next big debate", The Verge, 17 January 2018, https://www.theverge.com/2018/1/17/16903844/time-well-spent-facebook-tristan-harris-mark-zuckerberg.

Attraction and retention are particularly challenging from a policy perspective, as the mechanisms that can help to achieve them are often simultaneously features that users value and features that they have real difficulties with:

- Personalised feeds help users to engage with an otherwise unmanageable volume of content, but can also create filter bubbles that limit users' horizons.
- Infinitely scrolling interfaces and autoplaying content can be more pleasant to use than ones that cut off in arbitrary places, but can also make it easy to consume mindlessly.
- Notifications and alerts give users real-time updates about things they care about, but can overstate things of little consequence and damage users' ability to focus on the task at hand.
- Quantification of likes, shares and followers offers insights into which content and users are interesting to the wider community, but also sets up metrics to chase for the sake of it

Critical commentators often point out the similarities between many consumer apps and games of chance (What will the next thing I see in my feed be about? What is lurking behind my latest notification?) and a tendency for unevenly distributed rewards to reinforce compulsive behaviour or even addiction.[33] Lots of people say they spend more time on their phones than they would like, and that this time is not always as enriching as the other things they could have been doing.

At the sharpest end of this are all the places where services have unintended but serious negative effects on users' well-being. This includes low self-esteem associated with seeing unrealistic representations of other people's lives, reduced capacity to forge in-person relationships as a result of living mostly on the Internet, and the impossibility of finding refuge from bullying or harassment when your smartphone is always with you. Research by the Royal Society of Public Health looked at social media and young people's
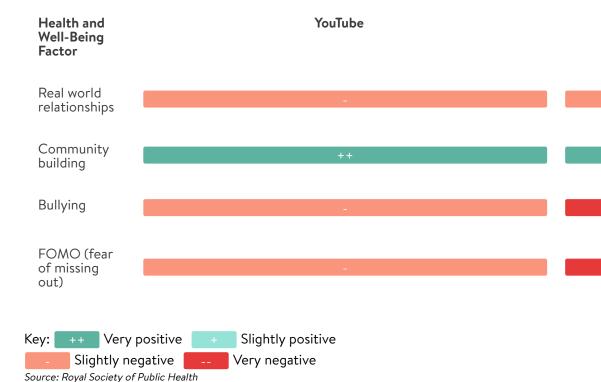
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33 Paul Lewis, "'Our minds can be hijacked': the tech insiders who fear a smartphone dystopia", Guardian, 6 October 2017, https://www.theguardian.com/technology/2017/oct/05/smartphone-addiction-silicon-valley-dystopia.

mental health and well-being, and found both positive and negative effects for all of the big apps (see table 5).[34]

Table 5: Effects of Popular Social-Media Apps on Young People's Health and Well-Being

Health and Well-Being Factor	YouTube	
Awareness of other people's health	++	
Access to expert health information	++	
Emotional support	++	
Anxiety	+	
Depression	++	
Loneliness	++	
Sleep	--	
Self-expression	++	
Self-identity	++	
Body image	-	

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34 "#StatusofMind", Royal Society for Public Health, accessed 28 September 2018, https://www.rsph.org.uk/our-work/campaigns/status-of-mind.html.

Health and Well-Being Factor	YouTube	
Real world relationships	-	
Community building	++	
Bullying	-	
FOMO (fear of missing out)	-	

Key: ++ Very positive + Slightly positive
  - Slightly negative -- Very negative

Source: Royal Society of Public Health

Issues like these become even more salient when children are involved. Much of the digital world was built on the assumption that users will be adults, but the reality is that children find ways to access digital products and services, and their needs and rights are not always properly addressed.[35] Meanwhile many parents struggle with how to bring up children in a world where technology has moved on so far from the experience they had in younger years.

The other side of the debate is about where the responsibility for how people spend their time ultimately rests. Whether or not to open an app or spend time browsing a feed is a choice, and for adults in a liberal society, responsibility for making these choices in an informed manner belongs first and foremost to the individual.

Moreover, the question of whether time has been well spent is highly contingent on what the next-best alternative is. Reading endless status updates from distant acquaintances may not be time well spent if it comes at the cost of interactions with close friends. But exposure to interesting thinkers online may be time very well

35 "5Rights", 5Rights, accessed 28 September 2018, https://5rightsframework.com/.

spent if the offline alternatives at that point are not particularly compelling.

Ultimately the challenge is to find an alternative to either an excessively paternalistic approach that undercuts personal liberty and falls short for many people or a laissez-faire approach that leaves others unable to manage in a world of overwhelming demands on users' time and attention.

Polarisation

As well as putting pressure on how people choose to spend their time, personalisation and targeting are straining people's perceptions of the wider world. This starts with the unintended consequences of trying to filter an effectively infinite amount of content in a way that suits users' unique tastes and preferences. But it is also significantly compounded by the presence of bad actors, for whom the Internet provides a phenomenally powerful new vector for malicious activity.

Internet activist Eli Pariser coined the term "filter bubble" to describe the phenomenon of an Internet experience that is different for each person, even when it is based on the same underlying products and services.[36] It arises in many familiar contexts: different people can search for the same keyword but see different results, follow the same accounts but see different content in their news feeds, or shop for the same items but see different options and price points.

In many circumstances this can be beneficial: displaying the answers that are most relevant to a user's particular context, or the content that is most engaging based on his or her interests, is one of the ways that aggregators provide a superior experience for consumers.

Nor are online environments and filter bubbles a one-to-one mapping. Social networks based largely on following organisations and personalities are likely to exhibit a high degree of convergence with prior interests and prejudices. Those that come closer to adding a digital dimension to other relationships like family or

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36 Eli Pariser, "Beware online 'filter bubbles'", TED talk, March 2011, https://www.ted.com/talks/eli_pariser_beware_online_filter_bubbles/transcript?language=en.

neighbourhood can be more diverse than people's daily experiences at home and at work. After all, you have a lot of say over which friends and colleagues you choose to hang out with, but no control over who you are related to.

Nevertheless, unlike the incumbents they displaced, aggregators are firmly focused on attracting and retaining users. For the most part this means consumers carry far more weight than they used to when it comes to determining what content comes out on top. And so the decline of traditional gatekeepers in fields like print news and politics cuts both ways: low barriers to entry and democratisation of access, but a massively reduced role for editorial decisions and curation of public spaces.

These low barriers to entry also apply to bad actors, including aggressive political operatives wanting to wage relentlessly cynical and negative campaigns, and foreign governments intent on undermining constructive debate and the legitimacy of elections.[37] The same tools that are so valuable for directing popular content and targeting advertising at the most receptive audiences can be co-opted as a means to distribute content that can be extremely damaging to democracy and social cohesion. And because of the vast scale at which the big Internet services operate, it is simply not realistic to expect every incident to be detected. Meanwhile, activists on one side rail against what they see as tolerance of abuse, while others warn that putting too much pressure on firms to act will result in them stifling fundamental freedoms.

All of this is more closely related to the rise of populism and the sorry state of modern politics than many people in Silicon Valley like to think. It is tempting to ascribe the victories of extremist candidates to mischief on social media, because this allows observers to maintain the fiction that everything is basically OK, and that things only turned out this way because a small number of voters were manipulated. But this is false comfort. Yes, there is a problem with bad actors exploiting the tools that technology provides, but the structural issue is the decline of the traditional gatekeepers that has allowed extremist candidates to break out and peel away mainstream voters in the first place.

37 Massimo Calabresi, "Inside Russia's Social Media War on America", Time, 18 May 2017, http://time.com/4783932/inside-russia-social-media-war-america/.

This leaves policy in a bind, with a legitimate aversion to big technology companies both exercising editorial control and trying to remain impartial. For those already concerned about the power of newspaper editors and television networks, the idea of tech executives as editors is often far more horrifying. Yet in the face of outcomes that many find disturbing (exhibit A: Brexit; exhibit B: Trump), observers can be quick to pin the blame on technology leaders for failing to use their power to take a stand. Regulation designed for print and broadcast media cannot help here, because the Internet is not just the same but bigger; a world in which everyone produces content as well as consuming it is fundamentally different.

Crime

In certain parts of the media and politics, a significant portion of the technology debate revolves around the Internet's role in perpetuating and amplifying criminal activity. Newspapers and politicians routinely talk about the Internet as a Wild West where people operate outside the law. For those wishing to capitalise on fear of the unknown, the so-called Four Horsemen of the Infocalypse provide an endless source of political capital: terrorists, drug dealers, paedophiles and organised crime are astonishingly effective trump cards if you want to avoid rational debate.

Invoking one or more of the four horsemen is often the prelude to an argument for a course of action that risks seriously jeopardising the rights and freedoms of the general public, for example:

- extensive surveillance of online activity, so that authorities can monitor it for signs of suspicious behaviour (at the expense of privacy and individual liberty);
- back doors in encryption that will allow communications and transactions to be intercepted and analysed (at the expense of undermining security and increased hacking);
- real-name policies that would prevent people using the Internet from choosing to remain anonymous (at the expense of chilling effects on speech and victims of abuse); or
- blocking access to websites that are suspected of hosting or dealing in questionable material (at the expense of excessive

blocking that cripples legitimate sites at the same time).

Heading down these sorts of paths is easy to paint as an exercise in common sense—finding a reasonable balance between ensuring freedom for law-abiding members of the public and preventing criminals from running riot. But unfortunately, offline experience does not translate well to the online environment when trying to figure out how to handle these sorts of issues. As a result, both the benefits and the costs can be dramatically different, and hard to balance.

Tech companies have not always made this any easier. In the early days of the Internet, many technologists talked about a new era in which openness, transparency and connectivity would allow the better aspects of humanity to thrive and cause the darker side to wither away. This optimism was always misplaced; operating at Internet scale is inseparable from serving all different parts of society, and human beings have the capability to use any tool for ill as well as for good.

The sheer scale of the Internet, and the general-purpose nature of the underlying technology, also means that proposals designed to inhibit malicious activity tend to risk significant unintended consequences, either now or in the future. Bulk monitoring of Internet activity opens the door to fishing expeditions and state profiling of citizens, and creates a honeypot for hackers.[38] Inserting backdoors into encryption protocols inevitably weakens them in other cases: the vulnerabilities that would be required to decrypt communications would also make online transactions like shopping or banking insecure.

And at a practical level, it is far from clear whether these sorts of policies would have the desired effect. Sophisticated users, including most high-value criminal targets, have ready access to technologies that can provide a layer of protection: virtual private networks (VPNs) and routing protocols that obfuscate what sites are being visited, messaging apps that implement open-source encryption protocols, and so on.[39] Short of extremely extensive

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38 "UK mass surveillance ruled unlawful in landmark judgment", Open Rights Group, 13 September 2018, https://www.openrightsgroup.org/press/releases/2018/uk-mass-surveillance-ruled-unlawful-in-landmark-judgment.

restrictions on the technology that private citizens are allowed to access, there is little that can be done to prevent this.

What is clear, then, is that the police and security services—which for so long had technological and logistical superiority—are having to cope with a serious degradation of capability relative to the criminals they are responsible for deterring, detecting and containing. Taking a cue from the world that has spawned so much of the opening up of technology, it may be time for a different set of innovations that give law enforcement more resources to focus on the weaker, more human points in the chain of criminal activity, rather than fighting a losing battle to put technology back in its box.

POLICY BY PROXY

Given the breadth and scale of these challenges, it is not surprising that there are countless examples of new technologies colliding with old rules and regulations, and new business models calling into question different views of public policy priorities. The absence of a proper understanding of the economics of the Internet is betrayed by three of the most common policy responses advanced by traditional politicians. In their own ways, all are about fighting to maintain the status quo, but they approach it in subtly different manners.

Rejecting Change

The first response tries to force innovation and change off the table, by whatever means necessary. This often takes the form of collusion with incumbent firms, unions or other groups that are likely to be displaced by competition from radically different models, or that are prepared to shoulder any economic and social cost to remain true to their ideology. This approach plays out in laws and regulations that ban new ways of doing business or impose administrative and financial burdens that make new models unsustainable. In darker times, some groups may also try to sow fear and resentment to wreck potential markets before they can become properly established.

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39 Kim Zetter, "Encryption Is Worldwide: Yet Another Reason Why a US Ban Makes No Sense", Wired, 11 February 2016, https://www.wired.com/2016/02/encryption-is-worldwide-yet-another-reason-why-a-us-ban-makes-no-sense/.

This response is seen most starkly in arenas that span the online and offline worlds. And so local politicians push through tough restrictions on rental apps like Airbnb or VRBO, supported by hotel groups, or on ride-hailing apps like Uber and Lyft, supported by the taxi lobby—limiting the potential for consumers to choose the option that suits them best.[40] Sometimes it does not even take new laws: in the UK, the market for shared electric scooters is dead on arrival thanks to a clause in the Highway Act 1835 that was intended to keep livestock off the pavements.[41]

Shifting Responsibility

The second response absolves politicians of any requirement to engage with tech, and instead pushes responsibility for resolving difficult trade-offs onto someone else. In practice this means tech firms are expected to find unspecified technical solutions to complex social problems, or else present themselves for summary judgement and execution in the court of public opinion. Never mind that common sense rarely survives contact with the laws of mathematics or the mind-boggling scale of the Internet, the billionaire geniuses in Silicon Valley just need to 'nerd harder'.

This response is particularly prevalent when it comes to topics like crime and copyright. In the UK, successive home secretaries, including current Prime Minister Theresa May, have demanded that tech companies find a way to make encrypted communications both secure from interference and easily readable by the government.[42] The European Parliament is responding to obsolete notions of copyright with draconian proposals for tech companies to filter all of the text, audio, photos and videos that users try to post online.[43]

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40 Katie Benner, "Inside the Hotel Industry's Plan to Combat Airbnb", New York Times, 16 April 2017, https://www.nytimes.com/2017/04/16/technology/inside-the-hotel-industrys-plan-to-combat-airbnb.html; Henry Goldman, "NYC Is Set to Impose a Cap on Uber", Bloomberg, 6 August 2018, https://www.bloomberg.com/news/articles/2018-08-06/nyc-set-to-impose-cap-on-uber-as-ride-hail-vehicles-clog-streets.

41 Shona Ghosh, "A 183-year-old law created for horse-drawn carriages has frustrated Silicon Valley's buzziest startups", Business Insider, 11 August 2018, http://uk.businessinsider.com/electric-scooters-illegal-1835-highways-act-2018-8.

42 Cory Doctorow, "Theresa May wants to ban crypto: here's what that would cost, and here's why it won't work anyway", Boing Boing, 4 June 2017, https://boingboing.net/2017/06/04/theresa-may-king-canute.html.

As with the FOSTA-SESTA package in the United States, which is intended to curb sex trafficking, pushing the burden onto tech companies may not only fail to address the underlying problem but also cause significant collateral damage to other Internet users and entrepreneurs.[44]

Expropriating the Gains

The third response accepts that innovation and change are unavoidable, and focuses on capturing as great a share of the gains as possible, to be distributed later as political patronage. This plays out most often in calls to tax successful new businesses to subsidise life support for industries that still hold political sway but that consumers no longer favour. Social media and online shopping are common targets, but other sectors like entertainment and transport are also talked about. This at least has a veneer of modernity, paying lip service to the progress enabled by technology while sending reassuring signals to those concerned about tradition and continuity.

This response is most common when the tech companies are perceived to be highly profitable, which makes it easy to mount a populist argument for redistribution. And so UK Labour Party Leader Jeremy Corbyn calls for a tax on Facebook to pay for local journalism, and on Netflix to pay for the British Broadcasting Corporation (BBC).[45] UK Chancellor of the Exchequer Philip Hammond wants a tax on Amazon to prop up high-street shops.[46] US President Donald Trump also wants to hit Amazon by making it pay higher fees to the US Postal Service, and looks to have Google in his sights next.[47]

43 Timothy B. Lee, "What's in the sweeping copyright bill just passed by the European Parliament", Ars Technica, 12 September 2018, https://arstechnica.com/tech-policy/2018/09/european-parliament-approves-copyright-bill-slammed-by-digital-rights-groups/.

44 Aja Romano, "A new law intended to curb sex trafficking threatens the future of the internet as we know it", Vox, 18 April 2018, https://www.vox.com/culture/2018/4/13/17172762/fosta-sesta-backpage-230-internet-freedom.

45 "Corbyn: Tech firm tax could fund journalism", BBC, 23 August 2018, https://www.bbc.co.uk/news/uk-politics-45271286.

46 Anna Mikhailova, "Philip Hammond threatens 'Amazon tax' on online retailers to help out high street", Telegraph, 10 August 2018, https://www.telegraph.co.uk/politics/2018/08/10/philip-hammond-warns-online-retailers-face-tax-raid-amid-high/.

A Better Way Forward

Sadly none of these approaches is realistic or sustainable. At a practical level, all eventually fail because no amount of outrage in the face of change can survive when people so clearly benefit from greater access to innovation and self-actualisation enabled by technology. At a more fundamental level, the real problem is that none really addresses or engages with the structural reasons why the Internet has changed so much so fast, and for so many people.

Some commentators advocate an alternative approach based on an aggressive role for the state, arguing in extremis that many of the products and services provided by big tech companies are akin to essential utilities and belong in public ownership. Turning tech companies into arms of the state, or replacing them with state-owned and -run alternatives, would certainly help ensure they supported the government of the day but would not address the underlying issues at the root of today's challenges.[48] Moving a big concentration of power from one set of hands to another would simply trade one set of potential abuses for another, while blunting incentives for customer focus and innovation. More fundamentally it would change nothing with regard to the economics of the Internet and its natural tendency towards scale—short of banning users from accessing alternative services or threatening to expropriate every new idea that gains traction, which few people would be prepared to live with.

Of course there is a role for government—and it should be far more entrepreneurial, seeking to leverage the properties of the Internet that make it possible to have outsize impact, and directing missions that connect private actors with the goals of public policy.[49]

47 Michael D. Shear, "Trump, Having Denounced Amazon's Shipping Deal, Orders Review of Postal Service", New York Times, 12 April 2018, https://www.nytimes.com/2018/04/12/us/politics/trump-postal-service-amazon.html; Kadhim Shubber and Naomi Rovnick, "Trump vows to address Google's 'leftwing media bias'", Financial Times, 28 August 2018, https://www.ft.com/content/535300f0-aaa6-11e8-89a1-e5de165fa619.

48 Jake Kanter, "A top British politician wants to create a publicly-owned tech company to rival Facebook and Netflix — but the idea is being ridiculed", Business Insider, 25 August 2018, http://uk.businessinsider.com/jeremy-corbyn-plan-for-british-digital-corporation-ridiculed-2018-8.

A better way through is therefore to consider what set of mechanisms, expectations and institutional arrangements would be required to better align the incentives of big technology firms with the broader public interest, so that people can enjoy the benefits of consumer-focused innovation while being confident that the power derived from it is exercised responsibly.

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49 "Mission-oriented innovation policy", UCL Institute for Innovation and Public Purpose, accessed 28 September 2018, https://www.ucl.ac.uk/bartlett/public-purpose/research/research-streams/mission-oriented-innovation-policy.

SOLUTIONS

Given how fundamentally the Internet has altered the structure and dynamics of industries and communities, there is no real reason to think that the trade-offs policymakers made when designing rules and regulations for the 20th century will be right for the 21st century. Across a broad range of policy areas, leaders need to reassess what is the right balance to strike in light of the new challenges of today's world.

The enabling rules and regulations of the 1990s and 2000s set the scene for astonishing growth and innovation in and around the Internet. But they also established a perception that many of the technology firms that benefited the most did so at the expense of basic values. Move fast and break things might be fine for a scrappy start-up trying to figure out whether an idea will even work; it is far less fine when the damage is to public trust and institutions.

The central dilemma for policymakers now is how best to protect and facilitate the innovation that big technology firms deliver, while ensuring that they do not pursue their commercial interests at an unacceptable cost to the things society holds dear. In previous eras policymakers would look to solutions that aimed to better approximate the outcomes of competition: price controls, divestitures, competitive tendering, and so on. But this assumes that the primary harms from scale are economic, and that the goal of policy is to arrest rent-seeking behaviour. In a world of platforms, aggregators and infrastructure, and of rapid innovation, a different set of interventions is required to match a new and different set of challenges.

The products and services provided by big technology firms have become a part of daily life for most people. These companies have a far more intimate relationship with consumers than the big brands of the past: users touch these firms' apps with their fingertips, carry them everywhere in their bags and pockets, and share everything with them. Big tech companies have also attained systemic importance in the wider economy, providing the digital infrastructure that enables modern businesses to operate and the new public spaces in which relationships play out, thoughts are shared and opinions are formed.

And yet big technology firms, and the markets they stand at the centre of, are not like classical models of competition and monopoly. Economies of scale and network effects mean that large firms can be both economically efficient and good for consumer welfare. The Internet has stripped traditional gatekeepers of much of the power they used to wield, and amplified many freedoms in the process. But it poses significant challenges as well: economic upheaval as disruption bites and competition policy flounders, and immense cultural pressure on privacy, polarisation and well-being. It has also concentrated power in the hands of a relatively small number of companies, which all too often wield that power clumsily and without sufficient legitimacy.

Liberals should of course be sceptical of concentrations of power, wherever they arise. But the exercise of power need not be a zero-sum game; when power is used responsibility and in the public interest, it can benefit all sides far more than destructive confrontation.

The urgency for Western policymakers is heightened further by the rapid progress being made in AI and the huge competitive challenge China poses in this respect.[50] A very different approach to rights and freedoms foreshadows the potential for large Chinese firms to accelerate their research rapidly and attain global leadership in this arena. There are already signs of China connecting its ambitions on AI to its drive to build out a massively expanded sphere of influence through the Belt and Road Initiative, an ambitious development strategy to boost economic growth across Asia and beyond. For the West to defend and promote its values, it must be able to lead the world in the development of core AI technologies, and define the wider system of ethics and governance needed to deploy them responsibly. Getting the approach to big tech companies right is an essential condition for achieving this.

Today's global tech firms do require a more muscular response from government, but make no mistake: this is not your parents' regulation. Across the board, technology-based challengers have not so much outcompeted incumbent firms as made them obsolete.

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50 Tristan Greene, "Expert predicts 'AI nationalism' will change geopolitical landscape", The Next Web, 26 June 2018, https://thenextweb.com/artificial-intelligence/2018/06/26/expert-predicts-ai-nationalism-will-change-geopolitical-landscape/.

The same is true of dusty old rules and regulations: policy is in disarray because the existing apparatus cannot get a grip on a set of issues that confound offline assumptions. For public policy to succeed again, leaders need to accept this shift and think creatively about how best to respond.

REASSERTING THE PUBLIC INTEREST

The economics of the Internet naturally favour big technology companies, and their products and services are overwhelmingly positive for consumers. But tech also brings significant new challenges, and bureaucratic regulation designed for legacy industries is a poor fit for the pace and scale of the Internet. A fresh approach, based on stronger accountability coupled with more freedom to innovate, is the best way to align private incentives with the public interest.

The fundamental proposition is that the profile of big technology companies obliges them to run their companies with due consideration of whether their activities are in the public interest.

The cornerstone of this approach is a new generation of regulator that can take an expert view of the activities of big tech companies. Whereas traditional sector regulators take a preventive approach based on rules and permissions, this new regulator would take an enabling approach based on values and accountability. And whereas traditional regulators deal with narrow and well-defined domains, a next-generation regulator must deal consistently with the common themes arising in any market upended by the Internet.

Crucially, it must have technical expertise comparable with that of the big tech companies, and be fluent in the same fundamentals of Internet-scale operations, speed, data and innovation. This means being able to attract and retain people with direct, senior experience of building and running tech companies to take part in building and running a new regulatory apparatus. This may be expensive, but this is not a reason to hesitate. To provide robust oversight, a regulator must be able to navigate the world of tech and be confident and informed when challenging it.

This new type of regulation must also be free from day-to-day political interference. A constructive and long-term relationship with the tech sector will never be possible when policy is made at the whim of political leaders who take affront to perceived personal slights. A robust set of founding principles to guide the a next-generation regulator's activity, along with credible and independent leadership, will be essential.

And it must focus first on the big technology companies that have outsize influence on the world around them. Making this next-generation approach to regulation operational will be a challenging undertaking; far better to keep the initial scope tight to make the problem tractable, rather than casting the net too wide and running into the sand as a result. Defining precisely where the boundary should sit is beyond the scope of this report, but taking a global view and considering firms with more than 50 million monthly active users, annual revenues of more than $1 billion or a market capitalisation of more than $25 billion would be a good place to start the debate before working down to smaller companies.

Focusing on the largest companies first is also important to protect competition. The risk of overbearing regulation that stifles innovation and entrenches incumbents remains very real, particularly because smaller and newer businesses will always lack the financial resources and legal heft of more mature companies. This is not to say that smaller companies do not have an obligation to act in the public interest; far from it. But one thing is certain: tech founders have no shortage of ambition. Companies that are serious about growth should expect to end up in scope for this new type of regulation if they are as successful as their founders and backers want them to be. Designing for this from the outset will be both good business sense and an important signal of maturity for investors and the markets.

Aspects of financial-services regulation provide a helpful analogy: operational independence, deep expertise drawn in part from industry, and forward-looking, risk-based oversight both of significant individual firms and of markets as a whole. There is not a direct read across, however. Financial services regulation is still grounded in permissions; regulators develop extremely detailed and extensive rule books, many activities cannot be undertaken until

they have been approved or licensed, and tools like capital requirements and product standards are used to restrict behaviour.[51] Tech needs a far more agile approach, and policymakers must think creatively about a new set of tools to achieve balance in an environment where scale, pace and incentives are very different.

And so although a next-generation regulator's scope and powers would reflect its focus on big tech companies, its creators can still draw on past experience to help with some aspects of its design. It should be modelled along the lines of other independent regulators and quasi-judicial bodies, so that it has the stature and authority to come to conclusions that all sides accept. It should have an independent board standing apart from day-to-day politics, so it can take a long-term view rather than having its focus dominated by reactions to short-term crises. And it should be able to levy a fee on the firms it oversees, to raise the funds required to fulfil its remit.

The regulator should be designed from the outset to take an international perspective and work across borders. The ideal authority would match the global reach of big tech companies with a global response to the challenges they present. In the current geopolitical environment, however, it is hard to see how a global regulator could come to a meaningful consensus on values or keep pace with the rapid evolution of technology.

The pragmatic solution is therefore to focus first on building a transatlantic consensus. The established liberal democracies of the United States and the European Union (EU) have enough in common to come to a shared view on values and responsibilities for tech companies, and on rights and well-being for consumers. Parallel regulators in these two jurisdictions, with a common forum for analysis and mutual recognition of rulings, would be a good enough first step. In the fullness of time, the two may work ever more closely together.

For the UK, if there is to be any silver lining from Brexit, it may be in the freedom to pivot towards this new approach more quickly than other countries. There is an opportunity to take a global lead in crafting fit-for-purpose regulation that tech firms adopt as a global

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51 "PRA Rulebook Online", Bank of England Prudential Regulation Authority, accessed 28 September 2018, http://www.prarulebook.co.uk/.

standard. If the UK retains broad equivalence with other aspects of European policy in areas like data protection, then in time the UK and EU approaches might again be harmonised.

Whether the scope of the possible is national, regional or transatlantic, this approach will take time to assemble. This is partly about getting the foundations right: thinking comprehensively about values, rights, freedoms and obligations would be a serious undertaking, along with the necessary legislative basis, organisational design and staffing. In the short term, therefore, it may make sense to graft some aspects of a new approach onto the existing regulatory apparatus.[52] In the long term, however, the aspiration should be to rationalise the regulatory landscape and wind down narrow institutions that have been made obsolete by technology, in favour of an approach that handles the major challenges of technology consistently wherever they arise.

In any event, a next-generation regulator would have a three-part remit: to ensure tech companies take their responsibilities seriously, to ensure consumers understand the technology in their lives, and to rewrite obsolete rules for the Internet age.

Responsibilities for Tech Companies

The first duty of the regulator is to help the big tech companies meet their obligations to act in the public interest, and hold them to account when they fall short.

It should require big tech companies to:

- **Develop community standards in consultation with users, governments and civil society.** Products and services delivered over the Internet and displayed on users' screens provide a new form of public space in which to interact and transact. Many of these spaces have increasingly clear standards that participants are expected to adhere to.[53] But although these standards can

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52 William Perrin, "Who Should Regulate To Reduce Harm In Social Media Services?", Carnegie UK Trust, 10 May 2018, https://www.carnegieuktrust.org.uk/blog/regulate-reduce-harm-social-media-services/.

53 "Community Standards", Facebook, accessed 28 September 2018, https://www.facebook.com/communitystandards/; "Uber Community Guidelines", Uber, accessed 28 September 2018, https://www.uber.com/legal/

be reasonable, they lack legitimacy: rules written by distant executives are quite different from laws passed by elected politicians. Seizing on the Internet as an opportunity to inject direct democracy into major services would be a mistake. As with many aspects of policy, the complexity and need to balance competing concerns makes this a task better suited to careful and informed deliberation. But firms can be required to consult far more extensively with users, governments and civil society, and explain the decisions they take on community standards and the reasoning behind them.

- **Enforce these standards consistently and report on exceptions.** Firms generally want to take action to uphold community standards and shut down bad actors, but can be reluctant to talk about this for fear that an admission of problems will be used against them. Nevertheless, neutrality can no longer credibly be invoked as a way to sidestep responsibility, particularly when a firm is the central actor in a marketplace or ecosystem that revolves around it and malicious users try to shirk responsibility for their actions. Tech firms should dedicate focus and resources to enforcement, make their best effort to uphold community standards quickly, fairly and proportionately, and be proactive in seeking out problems rather than waiting for them to be reported. The reality of enforcement at Internet scale is that false positives and false negatives are unavoidable, and when platforms deal with huge numbers of users and global footprints, it will never be possible to extinguish all bad actors. Companies should therefore provide a robust appeals process and far greater clarity about the occasions when things have gone wrong, including what actions were taken and what the consequences and lessons were.

- **Consider the best interests and well-being of users and society when setting strategy.** The size, scope and reach of big technology companies means they have a special responsibility to the people affected by their actions. The mission statements of many big technology companies are about changing the world, and this is to be applauded, but it must be set in the context of doing so responsibility. This means being mindful that this is uncharted territory, that human beings are not always rational and that democratic societies can be fragile. Because

community-guidelines/.

tech companies and their users are diverse, it is neither possible nor desirable to make a one-size-fits-all prescription about how features or services should operate. But from their privileged position, big tech companies should explicitly consider the broader impact of their actions. To do this, they will need to establish robust evidence about the effects of using their products and services, develop processes and norms to factor these into corporate decisions, and be confident explaining their actions to both the regulator and their shareholders (who have a long-term interest in tech companies aligning themselves with the well-being of their users).

These requirements set the stage for tech companies to take on the responsibilities corresponding to their power and influence, and to make decisions with greater legitimacy. There must also be stronger checks and balances to ensure that they are taking these responsibilities seriously, and sanctions for serious failings.

To give the regulator sufficient leverage, it should have:

- **Terms of reference that enumerate the values and responsibilities that society expects big tech companies to live up to.** To achieve a political and policy environment that is conducive to the magnitude of the task ahead, technology leaders and politicians need to understand each other's perspectives. This requires a patient and structured dialogue about the role of technology in the economy and in society. So before the regulator is put in place, governments should draw up and consult on a set of values and responsibilities that will define its mission. The process for this cannot be rushed and should include bringing together leaders in technology, politics, policy and civil society for an open-minded discussion about a world underpinned by the Internet. It should also take formal evidence from expert witnesses and seek the views and experiences of citizens. The final terms of reference should reflect the aspirations of advanced liberal democracies to protect freedoms, achieve social justice, and promote innovation and progress.
- **The power to audit the policies of big tech companies and**

conduct inquiries into matters of public interest. For the new responsibilities on big tech companies to have a real and lasting impact, there needs to be a mechanism for interrogating what is happening and rolling up lessons from individual firms into systemic insights. The regulator should therefore have a mechanism to audit the policies of the companies under its purview, to ensure that they are consistent with the agreed values and responsibilities and executed consistently and proportionately.[54] Crucially this is not about forcing companies with new business models to contort themselves to fit into old legislation. The key insight from the analysis in this report is that many tech firms are not traditional producers but rather facilitators of markets and custodians of community standards. This essentially makes them de facto regulators of their ecosystems, so the focus of independent scrutiny should be on ensuring they discharge the responsibilities of such a role adequately.

- **The power to sanction companies for reckless or negligent behaviour.** Scrutiny should reflect the complex and rapidly changing nature of the modern economy, and be mindful of the importance of taking a calm and considered view of contentious issues. A presumption of good faith would be a reasonable starting point, but there must be real consequences for companies that behave recklessly or are negligent in discharging their responsibilities. The sheer scale of the largest technology companies has reduced the effectiveness of some financial sanctions: even when they run into billions of dollars, this can still be viewed as an acceptable cost of doing business when the stakes are high enough.[55] If a sharper set of deterrents is required, this might extend to issuing directions to limit or mandate certain activities, appointing independent directors to company boards, or imposing restrictions on the right to operate in particular markets, either temporarily or permanently.

54 "Company Assessments", Global Network Initiative, accessed 28 September 2018, https://globalnetworkinitiative.org/company-assessments/.
55 "Google is fined €4.3bn in the biggest-ever antitrust penalty", Economist, 21 June 2018, https://www.economist.com/business/2018/07/21/google-is-fined-eu43bn-in-the-biggest-ever-antitrust-penalty.

Big technology firms owe their success both to brilliant leadership and innovation and to the benign operating environment in the advanced liberal democracies they call home. Many are now central to the modern economy and to people's daily lives. Policymakers should protect this progress fiercely but not shy away from setting high standards for tech companies when it comes to how they exercise their power.

Better Understanding for Consumers

The second duty of the regulator is to ensure that the customers of big tech companies understand what they are signing up for, including their responsibilities and obligations as users, and that this is consistent with what actually happens.

In many offline markets, products are simple enough to understand or consumers have an intuitive sense of the nature of the exchange. When things are more complicated, companies have developed mechanisms to help people make better-informed decisions; this includes traffic lights on food labels, energy ratings on domestic appliances and key-facts documents for mortgages.

When it comes to tech, many people do have a good sense of what a service is offering them, at least initially. Companies need to be able to articulate the benefits to encourage users to sign up, and lists of key features are prominent on websites and in app stores. Users are typically far less clear when it comes to the data that are generated, stored and processed further down the line.

The regulator should therefore require big tech companies to:

- **Develop tools for users to search, control and export data shared with a service.** In principle, users are fully informed about the actions they initiate on different services, be it posting a photo, asking a question, making a booking, sending a message, playing a video or whatever else. In practice, most people hand off responsibility for recording all of this onto the service itself. Although it is usually possible to request a copy of this data, the end result can be unwieldy and hard to do much with.[56] For

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56 David Nield, "How to Look Up Your Oldest Activity on Google, Facebook, Netflix, and more", Gizmodo, 26 September 2018, https://gizmodo.com/dig-up-your-oldest-memories-and-activity-on-google-fac-1829190061.

people to have a better understanding of what they have shared, they need to be able to review these data easily, and see clearly how long they are stored for and who else has access to them.

- **Provide straightforward summaries of what else they observe or infer about their users.** People's digital lives generate a vast and invisible data exhaust as they go about using different products and services. This is readily apparent to the firms that provide the services people use: when and where users access them, what they spend more or less time engaging with, and so on. And as well as considering each consumer as an individual, the presence of huge numbers of users provides an opportunity to infer things by comparison with everyone else. This can be the basis for valuable features like security challenges and personalised recommendations. But the profiling involved can feel sinister, particularly when there is a sense that algorithms are inferring intimate characteristics that people would prefer to keep private. A detailed breakdown of the inner workings of apps would be overkill. But a straightforward summary of what data are being observed or inferred, written for end users and updated with every major revision to the app, would strike a good balance.

- **Give users clarity about how a service is paid for.** This is particularly relevant for products and services that are free for consumers to use, or when there are significant sources of revenue other than payments from end users. Without clarity, consumers cannot make informed decisions about the economic exchange on offer—and a vortex of confusion and conspiracy theories can easily fill the void. There is nothing wrong with tech companies making money from products and services that create value for consumers, but there is a problem if people feel they are being kept in the dark. Again, a detailed breakdown would be overkill. But users should have a basic understanding of whether a service is supported by, say, adverts, donations or commissions; similarly, new services might have sources of funding to help them grow but an expectation that changes will be required down the line.

If improved understanding is essential for consumers to make informed decisions, then further action on transparency is the

backstop to ensure that straightforward, accessible tools and summaries for end users are consistent with what is actually going on.

To enhance transparency, firms should provide:

- **Individual archives of third-party commercial interactions.** The elimination of transaction and distribution costs has led to an explosion of activity on the Internet, including the ability of users to get their message, product or proposition in front of a carefully targeted audience affordably and with minimal fuss. When this is done well, it can benefit both sides: consumers are exposed to opportunities and information about things that are relevant to their interests, and firms can focus their investments on pursuing the best prospects. But third parties with financial skin in the game also introduce an element of uncertainty about whose interests come first. Simply publishing all paid content and promotions for anyone to see is not a workable solution: this would go too far in exposing commercially sensitive decisions made by small businesses to their competitors. But users should have a way to see what people have paid to put in front of them on an individual basis, and the broad parameters on which they were targeted.
- **A global archive of political and non-commercial content.** Unlike commercial content, where there is a need to balance transparency for individuals against privacy for small businesses, paid content whose purpose is to influence opinion or advocate causes is a different matter. In the offline world this was relatively easy to scrutinise: everyone can see a billboard or an advert in a newspaper, and even leaflets dropped door to door can be collected and archived. In the online world, however, content that serves the same purpose can be highly targeted, transient and difficult to save. The interests of society are best served by full and open knowledge about who is trying to influence public opinion, and this means opening up a complete account of who has placed or paid for what.
- **Anonymised data and secure environments for academic research.** The Internet's features are changing rapidly, and its impact on the world around it and on future generations is still largely unknown. Firms are rightly cautious about sharing

personally identifiable and commercially sensitive data, but too often this means that research is constrained by extensive non-disclosure agreements or impossible to replicate. This significantly limits the breadth and depth of evidence required for public understanding and good policymaking. New provisions should require all large services to provide greater access for rigorous research that is peer reviewed and protects privacy and trade secrets.

In some cases, the tools to achieve these objectives already exist, but users do not always know about them, and the primary action for tech companies will be to make sure these tools are promoted properly and are easy to use. In other cases, more substantial development may be required. Ultimately there is a huge premium on ensuring that participants in markets dominated by technology are better informed about how they work. Competition on the Internet may only be a click away, but this is meaningless if people do not understand their options.

Institutional Reform

The third duty of the regulator is to remove old-fashioned rules that make it hard for big tech companies to do the right thing, and rewrite others so they remain effective.

The complexity of modern technology, and the unique vantage point of big tech companies over the ecosystems around them, means that the most acute insights into the problems and potential ways forward often lie with the companies themselves.

The regulator should therefore:

- **Have the power to create safe harbours where firms can develop and test new solutions to economic and social challenges.** These have the purpose of protecting big tech firms from exposure to snowballing liability if they act in good faith to try to improve the ecosystem around them. Policy should help people do the right thing without holding them to impossible standards. But in the present environment it is too easy to paint every shortcoming as a damning indictment to score short-term

political points. To move things forward, the new regulator should establish explicit safe harbours across a range of Internet-enabled sectors to help firms experiment more openly and direct innovation towards solving big problems.

- **Recommend the repeal or reform of obsolete rules and regulations that currently inhibit innovation or the public interest.** The current policy debate is awash with examples of people trying to force new technologies, business models and markets into rules and regulations designed for the offline world. The effects of this can vary—from driving inefficiencies and bureaucracy into processes for no obvious gain to making it impossible for some products and services to be deployed at all, even if they have overwhelming public support. Safe harbours are a good short-term solution to these problems, but eventually policymakers will have to confront the harder task of repealing or rewriting the underlying legislation and regulation. While this job ultimately falls to legislatures, the regulator will have a unique perspective on the classes of problems caused by obsolete rules and be able to make credible, independent recommendations that are fit for the modern age and consistent across different sectors. This may extend to the behaviour of government itself; recommendations to open up more government data sets, alongside mandating more data sharing by large companies, could be an important way to enable future innovation.

There will always be a temptation for big tech companies to use their considerable resources to consolidate their power and outmanoeuvre governments.

The regulator should therefore:

- **Be required to approve acquisitions of potentially competitive start-ups by big tech companies.** There would be a presumption that these will not be allowed unless there is a compelling public-interest case to the contrary. The structure and incentives inherent in Internet-based businesses and markets mean that policymakers need to refresh their approach to competition policy. This means relaxing concerns about scale arising from

organic growth but being more sceptical of mergers and acquisitions by large incumbent firms. Historically, regulators have a poor track record of figuring out the scope of rapidly changing technology markets, and by the time the implications of acquisitions are realised, fighting an uphill battle to unwind history may be a poor use of official resources and political capital. A more forward-looking stance would help mitigate this. This means being alert to the different risks to competition posed by companies with different business models and strategies. Adopting this approach would mean accepting some degree of dead weight in terms of entrepreneurs and investors discouraged by a reduced likelihood of an early windfall. But on other fronts, wiping out the kill zone around big tech companies should make genuinely competitive innovation more viable. On balance, the short-term cost is worth carrying for the longer-term benefit of more diversity in technology businesses and leadership.

- **Have the power to place big tech companies into an alternative corporate-tax regime that allocates profits geographically in proportion to active users.** This would be a temporary measure to protect the public finances until global tax reform can be achieved, as the issues with corporate tax run far deeper than those related to tech companies. But right now, taxation is a major sticking point in most debates about technology policy, and is only likely to become harder still as more activity moves online—particularly for countries where global technology firms have little by way of permanent establishment. And progress will never be made on a rational debate about the role of technology if every discussion is dragged off course by a destructive confrontation on tax. Meaningful reform to protect the integrity of the public finances while retaining the principles of taxing profits and encouraging investment is therefore essential. If full international consensus for reform cannot be reached, then at a minimum a coalition of North American and European countries should agree to harmonise tax rates and apportion profits in line with what is known about the distribution of active users for a company's services.

In a world where the Internet touches every aspect of people's lives, many old rules and regulations are as obsolete as the old-fashioned products and services people no longer use, and the now-defunct companies they no longer deal with. There is still a critical role for regulation, but it needs to move with the times by opening up more space for innovation and new ways of doing things, while engaging more firmly where the power of big tech firms has not been properly checked.

CONCLUSION

A long-term realignment that repeals dusty and ineffective old rules and replaces them with a new framework based on responsibility for tech companies, agency for consumers and institutional reform would reset people's relationship with technology and those that build it.

Here are a few illustrative examples of how this might look in different domains:

- Social networks would employ both trained human beings and artificial intelligence to actively seek out harmful and illegal content, and do their best to find new solutions without being held to impossible standards.
- Gig-economy firms would leverage their scale to secure significant risk-mitigating benefits for people using their app, without this immediately reclassifying independent workers as employees or wiping out the flexibility that many people value.
- App stores would provide more options for developers to build sustainable and profitable relationships with end users, while continuing to act as a trusted intermediary and first line of defence against malware.
- News feeds and recommendations would place more weight on material supported by facts and analysis, without being forced to abandon personalisation or the paid content that supports free services.
- Infrastructure businesses would provide access to their services on terms that are reasonable and non-discriminatory, while keeping the freedom to continue evolving and without being made to prop up old industries too.

Although the implications would vary significantly in different markets, the common thread would be recognising that scale can benefit all parties, provided the correct incentives are in place to exercise power wisely and confer legitimacy on the outcomes that arise.

This means policymakers need to look past incremental tweaks to old rules designed for the offline world. Instead, they should

embrace a new approach to regulation and a bold reinvention of partnership suitable for a world where businesses built on the Internet are the norm, not the exception.

A next-generation regulator with a remit of the force and scope described here would match an operating environment defined by technology with a new approach to solving the policy challenges it poses. It would be the cornerstone of a new deal for an economy where big tech is in the ascendant.

Implementing this programme will not be an easy undertaking. A values-based approach, and the blurring of the boundary between corporation, regulator and community implicit in these proposals, is a radical departure from the old model of policymaking. But it is also essential for establishing a way forward that is compatible with the new reality of the Internet.

Importantly, accepting that big tech companies have public-interest obligations will be good for everyone. Governments stand to benefit from a more effective approach to dealing with harms and anchoring a new world on progressive values. Companies stand to benefit from taking actions that are ultimately in their long-term interests (even if this comes at the expense of short-term profitability). And society will gain from better and healthier relationships between its members and with the technology that connects them.

The leaders who can make this happen will be at the forefront of delivering a robust, rational and progressive response to a rapidly changing world, and by charting a route through the techlash will set the stage for a much-needed return to optimism about the future.

A new approach to regulating technology companies will deliver stronger accountability and more freedom to innovate. Bureaucratic regulation designed for legacy industries is a poor fit for the pace and scale of the Internet; a fresh start is the best way to align private incentives with the public interest.

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