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The New Economics and Regulation of Digital Platforms: Lessons from the Old World of Regulation?

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Abstract

This paper casts the economic and regulatory debate around digital platforms in a broader and more historical context. We emphasise that despite the considerable theoretical and policy-making discussion that focuses on the specific attributes of platforms—the presence of indirect network effects, economies of scale and difficulties of consumer coordination—that the challenge confronting policy-makers is an inherent tension between the desire to see “competitive” markets characterised by entry or by multiple competing firms, and other economic objectives such as efficiency and incentives to innovate. We note that similar challenges have been confronted in areas such as innovation policy and in network industries where sunk set-up costs and the resulting scale economies potentially limit the scope for efficient entry. Recent work by Weyl and White (2014; 2016) in fact emphasises the similarities between digital platforms and natural monopolies, and argues that even though unregulated platforms will not provide the socially optimal level and quality of service, any distortions created by platforms’ profit-maximising behaviour are not efficiently corrected by introducing more competition. They argue that such competition is likely to inefficiently fragment platforms and reduce the level of network effects that they deliver to consumers, and propose that a natural monopoly philosophy of regulation may be more appropriate.

In this paper, we focus on the historic experience of the telecommunications industry and its regulators in attempting to balance the desire to introduce competition with the natural constraints posed by the production technologies used in the industry. Telecom regulation has, at various times, had a “market-mitigating” character and at other times has had a “market-shaping” character. The former type of regulation is familiar natural monopoly regulation, which attempts to protect consumers against the consequences of a concentrated market structure, while recognising or accepting that the market structure may be difficult to change and may even have efficiency benefits. The latter type of regulation has involved regulatory efforts to affect market structure through tools such as wholesale access regulation justified by reference to “stepping stone” or “ladder of investment” theories, or vertical unbundling of incumbents. Examining the regulatory history of the US and UK we find that market-shaping intervention has had limited success in creating new entry, and that in both countries, the most important long-term driver of competition appears to be competition from new technologies, e.g., cable and mobile networks in the past and new fibre-based entrants in the present.

The experience of telecoms regulation—which we plan to expand to include the experience of additional jurisdictions besides the US and the UK—suggests that the production technology of an industry remains a powerful determinant of market structure. In the case of platform industries, network effects and scale economies may limit the extent of competition in the efficient delivery of platform services. If the experience of telecoms is anything to go by, efforts to engineer more competition in the primary platform market may encounter a high chance of failure or irrelevance in the face of underlying economic forces and technological progress. There may be merit in exploring a regulatory approach that attempts to mitigate market failures that result from concentrated market structures, as proposed by Weyl and White, and competition policy may play an important role in preventing the leveraging of market power from primary platform markets to adjacent services markets. However, policies aimed at increasing direct competition to existing digital platforms may encounter difficulties similar to those encountered by market-shaping policies in telecoms regulation.

Section 1: Introduction

Competition and regulatory policy issues around platform markets continue to attract significant attention. A recent movement within antitrust policy (see, e.g., Khan (2018)) has emphasised integration across business lines by dominant platforms as one means through which platforms can entrench dominance.³ Meanwhile, issues of consumer privacy, data security and “fake news” continue to attract substantial scrutiny. Besides these relatively newer forms of scrutiny, some of which are outside the perceived bailiwick of traditional competition policy, there has also been one long-standing and pervasive concern expressed in competition policy and in academic literature on platform-type markets. The widely held view in policy circles is that thanks to a combination of economies of scale, direct and indirect network externalities and switching costs, platform markets are prone to dominance which is likely to lead to inefficient market outcomes.

The solution to this is less clear—there is some recognition that in platform markets driven by network effects, the quality of service that platforms provide would suffer if platforms were fragmented. Nonetheless, some recent policy reports recommend mandating interoperability and standardisation of interfaces — both as means to prevent the leveraging of market power from platforms into adjacent markets, and as means to increase competition in primary platform markets. Other strands of policy thinking consider that some non-price dimensions of platform service provision—such as privacy or representation of political views—may require a regulatory framework to ensure that dominant platforms operate in the public interest.

There is an extensive economic literature on platforms. At least some of it does not appear to fully support the approach that is emerging in policy-circles. Weyl (2010) and Weyl and White (2014; 2016), for example, draw upon and generalise the results of older literature in network economics and public economics, which point out how a centralised entity (e.g., a monopoly telecommunications network in the case of Rohlfs (1974) or a government in the case of Dybvig and Spatt (1983)) can offer adaptive pricing to buy market share and network effects. Their concept of “insulating equilibrium” suggests that entrant firms—provided that a sufficiently high proportion of the available surplus is available for them to appropriate and provided that they have access to financing—should price low when they are small and network effects are low but can trade-off increased price against increased network effects as they get larger. Their theory suggests that (a) platform markets may “tip” and possibly lead to an inefficient technology becoming established, they are more contestable than is often thought to be the case; (b) fragmentation in platform markets may be a very inefficient outcome; and (c) platforms are indeed prone to market failures, albeit not of the variety that conventional competition policy can correct.

The theory that Weyl and White advance, and indeed the broader tensions between competition policy that views more firms in the market as a good thing and other strands of economic thinking that emphasise cost minimisation and achievement of network effects, or which emphasise innovation incentives, are echoed in a century or more of economic policymaking. In particular, they place strong emphasis on parallels with natural monopoly settings and more generally with industries characterised by economies of scale. In these circumstances, excessive entry could result in a socially inefficient outcome. Where this does not happen (either because of lack of entry or by the creation of legal monopolies), policymakers have been prepared to accept concentration as a way of achieving cost efficiency.

In yet other circumstances (e.g., the patent system) the trade-off between competition and appropriability for innovators has been explicitly acknowledged. In these cases, there have also been mechanisms such as classic natural monopoly regulation designed to control the consequences that flow

³ Khan, Lina M. “Sources of Tech Platform Power”, *Georgetown Law Technology Review*, Volume 2, Number 2, pp. 325-334.

from allowing concentrated markets. In the case of the innovation system, where network effects from standardisation may greatly enhance any market power that stems from the granting of patent rights, the institutional response has focused on limiting the exploitation of any resulting market power via incorporating technologies into the standard provided the technology owners make commitments to licence on reasonable and non-discriminatory terms. We label these types of interventions as “market-mitigating” interventions as they do not attempt to alter the market structure of the primary market, but instead aim to manage any potential market failures that result from it.

In platform contexts, Weyl and White draw our attention to the existence of “Spence” distortions. The Spence distortion arises because platforms will set prices to one side of the market (e.g., advertisers) based on the preferences of marginal consumers, and not on the preference of average consumers. For example, imagine a platform whose most intensive and loyal users wish to engage directly with other professionals in their field and have little desire to be contacted by recruiters and marketers who advertise and fund the platform. However, the amount of advertising and contact that consumers actually experience would be driven by the willingness to tolerate advertising and marketing activity of marginal and not average consumers. While platforms may be able to reduce the severity of such problems through price discrimination, this may create other (more familiar) distortions and itself attract competition scrutiny, in at least some jurisdictions.

While Weyl and White couch their main example of Spence distortions in terms of newspapers who charge too low or too high a price to advertisers and thus attract too much or too little advertising, if one interprets the provision of privacy and data protection in terms of implicit prices charged to both sides of the market, the incentives of profit-maximising platforms will diverge from the interests of average consumers and thus the public interest. For these kinds of market failures, which are precisely the ones that attract greatest public concern and reaction, market-mitigating regulation similar in spirit to the market-mitigating institutional responses discussed above, may be an appropriate response.⁴

The policy prescriptions stemming from the “(potentially contestable) natural monopoly” view of Weyl and White are potentially quite different from those in many parts of the broader competition policy debate on platforms. In some countries, the emerging view of policymakers is that there are inherent aspects of platform markets that render them especially vulnerable to inefficient tipping and there is scepticism towards the potential for competition for the market to be effective in disciplining incumbent dominant platforms, as discussed in more detail below in Section II. This is further enhanced by concern about the ability of dominant platforms to exert leverage into adjacent markets. In consequence, market-shaping policy and regulatory interventions designed to either prevent excessive concentration in the platform market from arising or promoting entry into this market via is on the agenda.

Such intervention could be implemented either via competition policy or by ex-ante regulation, or a combination of both. Either way, this market-shaping intervention is motivated by a desire to prevent or correct concentrated platform market structures and, also to prevent the inefficient leveraging of market power from primary platform markets into adjacent services markets. This latter form of intervention may be seen as complementary to other forms which are more directly focused on the primary platform market.

Our paper frames the contrast between market-mitigating and market-shaping interventions in a broader and more historical context. There is in fact nothing economically novel about the circumstance in which the underlying natural economics of markets or the need to ensure dynamic efficiency contrast

⁴ This regulation would not focus on prices. This is for several reasons. Adaptive pricing may be critical to the insulating strategies that Weyl and White suggest are critical for platform success, so regulating prices charged to one or other side of the market would interfere with this adaptation of prices. Further, if there is merit to the proposition that platforms are more contestable than is commonly recognised, price regulation or the prospect of it may send the wrong signals to entrants, for whom appropriability of their investment will be critical to their entry decision.

and even clash with the typical competition policy presumption that more firms in the market translates into more competition and better long-run outcomes.

The telecommunications industry, for example, has experienced a century of debates around very similar issues which provide a useful illustration of these debates. It also provides some insights into the potential effectiveness of market-shaping interventions when the natural economic forces at work in an industry favour scale and are characterised by externalities in adoption.

As we discuss at greater length in the remainder of this paper, the broad historical experience of the US, UK (and in subsequent drafts, the EU) in telecommunications provide some instructive illustrations of how market structures have evolved in the context of ex-post and ex-ante regulatory policy:

- There has been successful new entry by technologically differentiated networks (e.g., cable networks and mobile networks). The latest wave of such technology driven market entry seems to be underway with the construction of new fibre networks by new entrants. Where well-differentiated products have been combined with the right identification of market niches, customer groups, and initial pricing strategies, entry and entrants have apparently overcome the barriers to entry suggested by large sunk set-up costs and the need to achieve scale economies;
- Market-shaping interventions in the form of access regulation has a more mixed record. The first, and most fundamental type of such access regulation, was the standardisation of services such as voice, SMS and data together with the universal requirement for networks to interconnect with each other. Subsequently, access regulation such as Local Loop Unbundling (LLU) has been designed to target downstream markets (i.e., by allowing network operators to enter the downstream market through access to parts of the incumbent's network) while also seeing this as a stepping stone for increasing competition in the upstream facilities market. Such policies have been successful in the former objective but have had limited success in the latter.
- The alternative regulatory form, market-mitigating intervention, was the dominant form of regulation for the 20th century. Arguably the external technological environment was much more stable during this period than during the last 3 decades, making it difficult to contrast the experience of most of the 20th century with more recent experience. Given that nearly all countries either had natural monopoly regulation or command-and-control state ownership of telecoms networks in place, it is difficult to use the record of this period to evaluate whether the telecoms industry would have been better guided by market-shaping policies instead of market-mitigating ones.

It is beyond the scope of our paper to fully evaluate whether greater weight should be attached to Weyl and White's thesis than to conventional competition policy thinking about platforms. Our goal is to illustrate how tensions between these conventional competition policy goals and other economic objectives (cost minimisation and dynamic efficiencies) have been managed in another context in which natural economic forces seem to limit the scope for efficient entry. Nonetheless, we offer some cautious and tentative recommendations that could be applied to platforms.

The history of regulatory policy in the telecommunications market suggests that market shaping measures in the presence of scale economics and network externalities have often not been successful and may have resulted in inefficient market structures that have translated into higher costs for consumers. However, there is some reason to be optimistic about technological change and its ability to foster competition for the market or to provide differentiated products that enable multi-homing, enhance consumer choice and provide the basis for platforms that are eventually able to challenge incumbents more holistically. This has happened in parts of the telecommunications industry.

Section 2: The current policy debate on digital platforms

A. Introduction

The dramatic rise in scale and reach of the large digital companies over the past decade has been accompanied by an increasing focus on policy towards them. The period 2010-2020 saw some high-profile investigations of large technology companies by antitrust authorities at both national and international level that resulted in very large fines for behaviour that was found to contravene existing competition law.

In addition to this competition enforcement activity, many countries, together with some international organisations, have commissioned studies into the implications of digital platforms for regulatory and competition policy. These studies focus on different aspects of competition in digital platform markets and it is too early to identify an international consensus on how regulatory policy should adapt to the emerging challenges. However, many of the themes in the analysis and the recommendations contained in them are common across all of them. In particular, all of them (but with varying degrees of emphasis) express concerns about the seemingly natural tendency of platform markets to tip towards dominant platforms, and all of them express at least some degree of belief that competition between platforms would deliver better outcomes (i.e., more entry into the primary platform market would be a good thing). As we discuss in this paper, the tension between the “natural” economics of the industry—where the scope of entry is dictated by production technology, and especially the size of sunk set-up costs relative to available demand⁵—and the scope for entry has been well explored in the broader economic literature. It has also been the central tension that has faced economic policy-making in the telecommunications industry, as we discuss here.

B. Summary of Recent Studies

In this section, we give a very brief summary of four of the more high-profile studies that have been undertaken in recent years. These are:

- The OECD report on Rethinking Antitrust Tools for Multi-Sided Platforms from 2018 (the “OECD Report”);⁶
- The Stigler Centre, University of Chicago Booth School report on Unlocking Digital Competition from 2019 (the “Stigler Center Report”);⁷
- The report of the Digital Competition Expert Panel in the UK on Unlocking Digital competition from 2019 (the “Furman Review Report”)⁸; and
- The European Commission’s report, Competition Policy for the Digital Era of 2019 (the “Crémer Report”).⁹

Following that, we discuss some of the common themes that emerge from them, particularly in issues such as the dynamics of digital markets and the tendency to tip towards high levels of concentration, market outcomes which result in inefficient lock-in to incumbent platforms and the implications of fragmentation of platforms for optimal outcomes.

⁵ Sutton, John (1991), *Sunk Costs and Market Structure: Price Competition, Advertising and the Evolution of Concentration* (Cambridge, Massachusetts: MIT Press).

⁶ OECD: Rethinking Antitrust Tools for Multi-Sided Platforms, 2018

⁷ The Stigler Centre, University of Chicago Booth School: Unlocking Digital Competition from 2019, Committee for the Study of Digital Platforms, Market Structure and Antitrust Subcommittee; 2019

⁸ UK Government: Unlocking digital competition; Report of the Digital Competition Expert Panel; March 2019

⁹ European Commission: Competition Policy for the Digital Era A report by Jacques Crémer, Yves-Alexandre de Montjoye, Heike Schweitzer; 2019

The OECD Report

The OECD Competition Committee held a hearing in June 2017 into the economics of multi-sided platforms and the implications for competition policy, analysis and enforcement. Its report was published in April 2018 and contained papers written by the contributors to the hearing and their co-authors, along with a synthesis written by OECD staff. Although the report is a collection of chapters written by participants at the hearing and does not necessarily represent the views of the OECD, the fact that it was organised and published by the organisation means that it is significant contribution to the global policy debate about how to address competition problems in digital markets.

The report sees the cross-platform externality as central to the definition of platforms. In these cases, the structure of prices (i.e., on both sides of the market) will determine the volume of activity on the platform and not just the price on one side. This means that the greater the number of users on one side of the platform, the greater the value to users on the other side of the platform. This is one of the features of digital platforms that tends towards concentrated markets since bigger platforms are more efficient than smaller ones, *ceteris paribus*.

In the chapter on network effects and efficiencies¹⁰, the authors note that mergers between platforms can be efficiency enhancing, simply because they result in a larger user base, because it is the size of the user base that determines the value of the matching services provided by the platform. Mergers of platforms can therefore improve the welfare of users because they are creating a bigger user base and therefore more valuable network externalities. In some cases, this can be welfare enhancing for one side of the platform (e.g., advertisers), even if the prices that they pay increase because they are able to reach a bigger audience.¹¹

The report is clear that the dynamics of digital platform markets creates specific challenges for competition policy. In particular, some of the main tools used by competition authorities such as market definition, market power, exclusionary conduct, efficiencies and vertical restraints, may not be as relevant when considering multi-sided markets as they are in the traditional context. In some cases, conventional approaches to key concepts in competition policy may have to be adapted when applied in these market structures. However, it also notes that many platforms have this feature but not all of them require a special approach to antitrust policy. Ultimately, it will depend on specific features of the platform and whether or not these create particular problems for competition policy.

The Stigler Center Report

This report is the product of a process initiated by the Stigler Center at the University of Chicago Booth School of Business to develop analysis and policy recommendations on digital platforms. It was not commissioned by the US Government but has been a significant contribution to the global debate on policy towards large technology companies.

The report covers many aspects of the digital economy and proposes a wide range of policy measures. The section on market structure and antitrust focuses on the economics of digital platforms and measures that could be adopted to address problems with competition. Its analysis of the underlying economics of digital platforms shares much in common with the other studies. It identifies network externalities, economies of scale and scope and the importance of data as key factors that drive the dynamics of digital platform markets. It also discusses the barriers to entry and expansion that are raised by consumer behaviour which has natural tendencies to favour incumbents' products but which can also be reinforced by the way in which products are designed and provided. In particular, customers' tendency to single home is likely to entrench the market position of incumbent platforms.

¹⁰ Network effects and efficiencies in multi-sided markets, Howard Shelanski, Samantha Knox and Arif Dhilla¹

¹¹ p194

The report also discusses the role of data in digital competition in detail and emphasises the increasing returns to the size and dimensionality of data that is collected in relation to platform users. Ownership and control of this data strengthens the position of incumbent platforms through their ability to provide a better quality of product to advertisers.

The reports is clear in its analysis of the tendency of digital platforms to tip towards high levels of concentration. It discusses the harms that potentially arise from this, particularly around reductions in the quality of products offered to users. It also concentrates on the potential for entry by rivals into the platform market. In its view, there are multiple ways in which incumbents can block or impede entry by rivals, including methods for influencing user behaviour to the disadvantage of potential rivals, exclusivity and loyalty commitments in user contracts, bundling of services etc.

The Report recommends changes to some aspects of the antitrust regime, including changes to the merger control regime that would tighten scrutiny of mergers undertaken by large digital platforms, including lower or different merger thresholds to allow review of acquisitions by incumbents of small firms. It also recommends stronger enforcement against single firm conduct by recalibrating the desired balance between false positives and false negatives.

Importantly, the report also concludes that, given the fast-moving and complex nature of digital markets, ex-post competition enforcement is unlikely to be sufficient to address issues that arise from the dominance of digital platforms. It therefore recommends that supplementary ex-ante regulation is likely to be required. This could be done through the establishment of a specialist regulatory unit, the “Digital Authority” which would develop, monitor and enforce rules relating to platforms with “bottleneck power”.¹²

Such rules would cover areas such as non-discrimination and rent expropriation, mandated open APIs for interoperability and data mobility, opening access to certain types of user data and pro-consumer default rules. It would also give the Digital Authority powers and responsibility for collecting data in relation to digital platforms markets.

The Furman Review Report

The expert panel was established in September 2018 to consider the challenges posed by the digital economy for “competition and pro-competition policy” and to make recommendations for any changes needed. The panel was explicitly asked to look at the impact of the digital economy on competition in markets such as social media, e-commerce, search and on-line advertising. It also had a specific focus on both how competition policy should be adapted to address the challenges presented by the digital economy, and the opportunities “to enhance competition, to increase business innovation and expand consumer choice”.¹³

The panel’s brief was to look at the “digital economy” broadly and the report avoids a long and potentially inconclusive discussion about definitions by refusing to define it precisely. It does not limit itself to platform markets but does discuss them extensively as all of the biggest players in the digital economy have platforms as a core component of their business model.

The report reviews some of the most important digital markets and provides summary data that indicate the degree of concentration of these markets. It notes that there are some features of digital markets (e.g., multi-homing, price-comparison tools etc.) that would be expected to enhance competition. However, it sees other features, such as the economies of scale and scope that are inherent in digital platform businesses, that tend towards concentrated markets.

¹² pp 84-85

¹³ pp 3

The report notes that there are significant fixed costs incurred in establishing a digital service but, once established, the marginal cost of increasing outputs is close to zero. This generates strong economies of scale which tend towards large companies and concentrated markets. It also allows these companies to provide services in multiple countries which is less common in the physical economy where scale is usually constrained by the cost of physical infrastructure or the cost of marketing and transporting products. These economies of scale are accompanied by economies of scope that derive from the ability of digital companies to service markets that are adjacent to their core market through the use of customer data, branding, supplier relationships etc.

These key economic characteristics of digital markets – strong economies of scale and scope – are further enhanced by the central role of data in the business models of companies operating in the digital economy. The very large datasets generated by the big digital companies are difficult for entrants, not least because of the positive feedback loops that occur in the collection and use of data. Digital companies that have a large amount of data are able to provide a better quality of service to their customers. This helps them to grow their market share and allows them to collect better data and so on. This collection and use of data to improve products and increase customers stickiness represent significant barriers to entry and expansion by competitors both in the platform market itself and in adjacent markets.

The report goes on to discuss the importance of network effects in supporting the growth of digital platforms and distinguishes between direct and indirect network effects. The former is used to refer to the idea that the value of a network increases as the number of users increases because users are able to interact with a greater number of parties. Indirect network effects, on the other hand, are cross-platform effects that link two separate groups of users that interact via the platform. An increase in the number of users on one-side of the platform increases the value to the other side. In theory, such network effects tend to lead to larger firms and more concentrated markets since the firm with the largest number of users can offer a superior product to firms with fewer users.

The report does acknowledge that such network effects do not inevitably result in market concentration if customers are able to use more than one platform simultaneously (i.e., multi-homing) or easily switch services. However, it also notes several features of digital platform markets that create barriers to customers' ability to switch including loss of personal data, loss of reputation, anti-competitive terms in user contracts technical barriers and tying of services etc.

The report notes that high market shares are not necessarily an indication of lack of effective competition. The threat of competitors entering the market and overtaking the incumbents (i.e., competition for the market) can have a significant disciplining effect which would not be observable from current market shares. However, set against this, the reports observes that current major digital platforms have been dominant for many years and have been able to entrench their market positions as a result of their scale, the development of an ecosystem around their core products and their willingness to undertake strategic investments to bolster their market position.

The report acknowledges that scale may deliver efficient outcomes for consumers as a result of the network effects inherent in digital platforms. However, it notes that this outcome “is only satisfactory if consumers receive a sufficient share of the benefits of these efficiencies. When a single platform faces limited competition for the market and many fragmented users with limited bargaining power, this is unlikely to be the case over the long term.”¹⁴

The result can be sub-optimal outcomes in terms of the price and quality of service that customers receive (e.g., through the amount of advertising that a user faces). Although monetary prices paid by consumers for using platforms are frequently zero, the report notes that this, in itself, could be too

¹⁴ pp 42

high. A negative price (i.e., paying the consumer to use the platform might be the optimal outcome). Other types of direct harm to consumers also take place (e.g., discriminatory behaviour by platforms in the way they treat certain third parties) or self-preferencing by platforms in markets that are adjacent to the platform's core market.¹⁵

The report also details examples of indirect harm to consumers through their bargaining power with respect to third party business users, including a wide range of businesses from app developers to newspapers and other journalism organisations. It cites high profile competition enforcement actions such as the Google Shopping and Google Android cases and other examples of situations where digital platforms have negotiated unfair terms in its contracts with companies that operate through it.

The report concludes that digital markets that naturally tip towards concentration create opportunities for dominant companies to abuse their position. But, even where this does not take place, better outcomes would be achieved if the markets were “less concentrated, more contested and more dynamic.”¹⁶ Its recommendations have the objective of reducing the risk that markets tip towards “winner-takes-most” outcomes and to the entrenchment of that position.

The report makes recommendation for strengthening of some areas of the competition regulatory framework. However, it is also explicit in its objective of using “pro-competition rules and frameworks that open up opportunities for competition...”¹⁷ It introduces a key concept which is referred to as “Strategic Market Status” (“SMS”). This could be applied to certain companies that have achieved sufficient scale to put them in a position which would allow them to behave in an anticompetitive way or in which they could undertake behaviour that would result in sub-optimal market outcomes.

The recommended changes to the competition framework include more frequent and firmer action to challenge mergers that could be detrimental to consumer welfare through reducing innovation and competition, a requirement that companies with SMS inform the CMA about all of the mergers that they intend to implement and an update the Merger Assessment Guidelines to include the size of potential impact as well as likelihood of adverse impacts to consumers.

In parallel with these changes, the report recommends the establishment of a regulatory unit with specific responsibility for digital markets (the “Digital Markets Unit”) and a set of ex-ante regulatory measures that include a code of conduct for certain companies, requirements for data mobility and open standards; and secure access to non-personal and anonymised data.

The Crémer Report

The report was produced at the request of Commissioner Vestager and published in 2019. Its focus is on competition policy and how it should be updated to reflect the challenges presented by digital markets. Indeed, it is explicit not only in the limits of its terms of reference to competition policy, but also in its view on the right policy approach for digital markets.

“In these very fast moving and diversified markets, we believe regulations organising the whole sector—akin to the type of regulation used for traditional utilities—to be inappropriate.”¹⁸

It does not limit itself to digital platforms only but does discuss them in detail including a whole chapter focusing the specific dynamics of competition in platform markets.

Its starting point is a description of the defining characteristics of the digital economy, including extreme returns to scale, network externalities and the central role of data. In its consideration of

¹⁵ Paras 1.129-1.131

¹⁶ Para 2.13

¹⁷ Para 2.15

¹⁸ p 19

platforms, the report does not limit itself to two-sided platforms. It also includes one-sided platforms (i.e., what has traditionally been referred to as networks) and platforms that combine both features (e.g., social networks). The report's definition of platforms also goes beyond on-line intermediation services to include functions such as operating systems, browsers and app stores.

The report notes that, although economies of scale and network externalities both tend towards markets with a small number of large companies, there is a conceptual difference between them. Large platforms benefit from economies of scale because of technology. However, they also benefit from network effects because of the difficulty in coordinating a switch by customers to a competing platform. The report notes that, even if users would benefit from a coordinated shift to a rival platform *en masse*, there might not be an incentive for individuals to migrate if they were not sure if others would follow. These network effects could therefore prevent or slow down a superior platform from overtaking an incumbent one although the size of this incumbency advantage will depend on factors such as multi-homing behaviour, data portability etc.

The report acknowledges the implications of economies of scale and network externalities for efficient market outcomes. Under certain conditions, it could be that the optimal outcome is one of highly concentrated platform markets which maximises the efficiency benefits arising from economies of scale and network effects. However, it notes that the threat of entry (i.e., "competition for the market") may serve to discipline incumbent platforms but it is sceptical about whether this is a realistic possibility given the strength of incumbent advantage arising from network externalities and the customers lock-in effects created by data and ecosystems.

It is an understatement to say that the applicability of the contestable market theory has been controversial in traditional markets. It is even more doubtful in the presence of network externalities and ecosystems. Indeed, where network externalities exist, a new entrant needs not only to offer better quality and/or a lower price than the incumbent, but also to convince users of the incumbent to coordinate their migration to its own services. When the platform is part of an ecosystem, the lack of interoperability with other services of the same ecosystem and the absence or limited access to historical and future ecosystem data will make it difficult for a new entrant to compete on the merit of the specific service and/or algorithm.¹⁹

The report discusses in detail the importance of the different types of data in the digital economy and the importance that it plays in competition between platforms. The report also emphasises the role of ecosystems around the products and services that are provided by digital companies. This includes a range of different on-line services but can also incorporate integrated hardware and operating systems. This competition between ecosystems may be pro-competitive if such ecosystems allow provides to offer a better suite of products. However, it may also prevent competition on the merits of individual components of the ecosystem if products within the ecosystem have access to more data than products outside the ecosystem.²⁰

It concludes that, although competition between large ecosystems can be intense, it does not necessarily mean that competition for individual components of the ecosystem is equally intense. It also notes the possibility that competition between multi-product firms may be more susceptible to collusion than firms competing on individual products or groups of products.

The report discusses ways in which competition for the market can be promoted. These include:

¹⁹ p36

²⁰ p34

- Merger control – preventing incumbent platforms buying up entrants that are a potential threat to their market position;
- MFN (best price clauses) imposed on firms using the platform that may make it more difficult for new platforms to enter the market.
- Multi-homing and switching which the authors see as critical to facilitating market entry by new platforms.
- Data regulation (portability and interoperability).

It also discusses the role of platforms in driving competition between firms that operate on it. Platforms play a role in regulating the way in which participants do business and compete with each other. These rules therefore play an important part in determining the competitiveness of these adjacent markets. This also leads to a discussion of situations that arise when the platform is, itself, also a participant in one of the adjacent markets. This can create incentives and the ability to leverage market power the platform enjoys in the upstream platform market into the competitive adjacent market.

The report explicitly states that utility-style regulation would be inappropriate for digital markets and it does not recommend the introduction of such an ex-ante regulatory framework. This is consistent with its terms of reference which was to look at ways in which competition policy and enforcement should be adapted in the context of competition in digital markets. However, the report does recognise that “There are other areas where regulation might be appropriate, in particular where similar issues arise continuously and intervention may be needed on an ongoing basis...”²¹

Some of the proposals that are made in relation to dominant players are similar to proposals made for ex-ante regimes by other reports. One such proposal is that, “Dominant platforms should be subject to a duty to ensure interoperability with suppliers of complementary services.”²² The report discusses the merits of requiring access to dominant platforms’ data through a revised essential facilities doctrine. It also recommends that dominant platforms should be required to ensure that their rules for participants on their platform do not impede competition in these adjacent markets without an objective justification.

C. Common themes

Although the reports vary in their focus and in their conclusions, there are some themes that feature in all of them.

There is a common analysis of the underlying economics of the digital economy, and of platforms in particular. These include economies of scale, economies of scope and network effects which together mean that these markets tend to result in concentrated market structures with a small number of large players. There is also a common view on the central role of data in digital markets. This strengthens these underlying economic drivers of market structure. Data also creates further barriers to competition through increasing customer stickiness and creating mechanisms for exerting leverage into adjacent markets.

Together, these factors lead the reports’ authors to the conclusion that there is a problem with competition in digital markets, particularly in which there are large digital platforms operating. This problem is demonstrated by the size of the big firms and their ability to sustain their market position over long periods of time and their ability and, in some cases, willingness to engage in anti-competitive behaviour. Even, where there is no evidence of such behaviour, the reports conclude that

²¹ p70

²² P71

consumers would be better off if there was more competition between platforms and in adjacent markets.

In order to achieve this, the reports also recommend that the current regulatory arrangements are updated although there is some variation between them in the legal frameworks for doing this. The Crèmer Report, for example, focuses primarily on adjusting the competition policy framework whereas the Stigler Report and the Furman Review Report also recommend creating a new ex-ante regulatory framework to apply to some digital companies.

Despite this difference in legal and institutional approaches, there is some common ground in the reports on the types of problem that should be addressed. These include adjustments to merger control, vertical leverage, data portability and system interoperability. Further, and critically for the purposes of our paper, while all the papers acknowledge the benefits and potential efficiencies of scale, they also all put at least some weight on the benefits of competition in the primary platform market. The goal of our paper, of course, is to distil insights from how this tension between the structure implied by natural industry economics (on one hand) and the prevention or mitigation of the inefficiencies that might arise with a concentrated market structure (on the other hand) has been managed in an industry with a now-long record of varying types of intervention, i.e. the telecommunications services industry.

At various points and in some contexts, policymakers have attempted to “manage” or “mitigate” the effects of a naturally highly concentrated industry, but at other points and in other contexts, policymakers have targeted the promotion of competition and entry at both upstream and downstream layers of the industry. Before we discuss the experiences of the telecom industry, however, we provide the broader theoretical and historical context. This broader context informs our belief that something useful can indeed be distilled from the broader economic record of the last century.

Section 3: The Broader Economic Background

A. “Conventional” Competition Policy Goals

The European Parliament explains that the end-goal of European Competition Policy is ensuring “the proper functioning of the internal market.” It goes on to state that “effective competition enables businesses to compete across member states” and puts these businesses “under pressure to strive continuously to offer the best possible products”, which “drives innovation and long-term growth.”²³ This view, of course, goes back quite far in economic history. Adam Smith spoke of the “invisible hand”, wherein self-interest and competition serve as “the motivator” and “regulator” of economic activity, directing resources to their most valued use.²⁴ One type of economic view has always emphasised the value of competition and its role in delivering innovation. John Hicks observed that “the best of all monopoly profits is a quiet life” and this motivates firms to “escape the competition” by innovating. On the other hand, implicit in this view is that there must be monopoly profits to “escape to”, or at least that the gains from innovation must accrue to the innovating firm in sufficient proportion as to make the investment in innovative effort worthwhile.²⁵ Thus there is much in the economic literature and much in the tradition of competition policy that supports the notion that product market competition is integral to long-term economic welfare and innovation.

However, there has always been a tension between ensuring product market competition on the one hand and providing sufficient incentives for inventive firms to invent in the first place. This is recognised in patent law, for example, which provides inventors (provided the invention is sufficiently novel relative to the prior art) the right to exclude others from using that invention (i.e., a monopoly) subject to limitations on the breadth and the length of the patent rights. To at least some degree, mainstream economic theories of innovation have paid attention to the Schumpeterian Hypothesis that a market structure involving “large firms with a considerable degree of market power is the price that society must pay for rapid technological advance”, while “the long-run gains to society from continuing innovation are vastly greater than those associated with competitive pricing.”²⁶ In particular it is worth noting the tension between what are seen as uncontroversial propositions in competition policy and modern mainstream economic theory on the subject of entry. In industries with large fixed costs and low marginal costs, academic literature suggests that there may well be a policy basis for restricting entry, not encouraging it.²⁷

B. Competition Policy, Industry Structure and Innovation: A Brief Perspective

There has also been a historic tension between the underlying technological and commercial dynamics of industries, and the ideal that competition begets efficiency. Competition law began as “antitrust” law in the United States in the 19th century, and in a fascinating essay, Collins (2013) highlights how “trusts” or “combines” came to be of such concern in the emerging industrial economy of the time—

²³ <https://www.europarl.europa.eu/factsheets/en/sheet/82/competition-policy>

²⁴ <https://www.stlouisfed.org/education/economic-lowdown-podcast-series/episode-3-the-role-of-self-interest-and-competition-in-a-market-economy>.

²⁵ Joshua D. Wright (2011), “Antitrust, Multidimensional Competition and Innovation: Do We Have an Antitrust-Relevant Theory of Competition Now?”, Chapter 7 in Geoffrey L. Manne and Joshua D. Wright, eds., *Competition Policy and Patent Law Under Uncertainty: Regulating Innovation*, Cambridge: Cambridge University Press.

²⁶ Nelson, Richard R. and Sidney G. Winter (1982), “The Schumpeterian Trade-off Revisited”, *American Economic Review*, Volume 72, Number 1, pp.114-132.

²⁷ Mankiw, N. Gregory and Michael D. Whinston (1986), “Free Entry and Social Inefficiency”, *Rand Journal of Economics*, Volume 17, Number 1, pp. 48-58. Mankiw and Whinston establish that if entry reduces the output of incumbent firms, then entry is more valuable to the entrant than to society as a whole. In industries with high fixed costs, if entry does not result in expansion of output but merely transfers business from incumbents to entrants (“the business-stealing effect”) it will be socially inefficient. The authors refer to the long-standing faith of economists in unencumbered entry but point out that in homogeneous product markets and in the presence of imperfect competition, there is always a bias towards excessive entry. However, where entrants contribute to product variety (i.e., offer differentiated products) this bias is less clear-cut.

the new industries that powered innovation in the late 19th century, were driven by economies of scale in a way that the agrarian economy or even the early industrial economy in Britain and the United States was not. Collins points to Bessemerisation in producing steel, new distillation methods in refining petroleum and the new network industries such as railroads and telegraphs. Firms in these industries soon realised that parallel networks resulted in “bankrupting competition”—thus the U.S. telegraph industry carved up the Eastern half of the U.S. into six territories, each of which were characterised by exclusivity for a single telegraph operator; and then ultimately merged into Western Union in 1866. Collins describes the changing technologies of the 19th century as providing a powerful reason for why it became critical to distinguish between large unitary business enterprises (which could exploit scale economies, as well as scope economies and economies of integration) and combinations or conspiracies of independent firms.²⁸

A few decades later, another industry emerged in which the role of economies of scale and economies from vertical integration formed the justification for vertically integrated monopoly operators whose monopoly power was tamed not by recourse to the process of competition but by regulation. The telephone industry in the United States and parts of Canada became the exemplar par excellence of a regulated natural monopoly, predicated on the idea that it was possible to capture the cost efficiencies that might be associated with a single firm producing the entire output of an industry (a “normative natural monopoly”) while mitigating the anti-competitive effects (reducing the deadweight loss) associated with the exercise of monopoly power.²⁹ Of course, the theory of natural monopoly had not yet been rigorously explored in economic theory, or tested empirically, at the time that the United States (which was the first country to establish now-familiar institutions of regulation, such as regulatory commissions and agencies) was setting up an extensive system of utility regulation. By the 1970s and 1980s, both empirical evidence and economic theory questioned whether the Bell System (discussed in Section IV) was a natural monopoly and whether its pervasive regulation was actually necessary.³⁰

C. The Limits of “Competition”?

Nonetheless, the acceptance of regulated natural monopolies, sometimes even statutory monopolies, in the context of network industries provides a significant precedential example of economic policymaking that accepts the limits of competition. In a different way, so too does the economic policymaking component that is inherent in patent law. Whereas the thinking behind regulated natural monopolies embraces the trade-off between competition and cost-minimisation, the thinking behind patent law embraces the “Schumpeterian” trade-off between competition “in the market” and

²⁸ Collins, Wayne D. (2013), “Trusts and the Origins of Antitrust Legislation”, *Fordham Law Review*, Volume 81, Number 5, pp. 2279-2348.

²⁹ This was accomplished by setting prices to equal the long-run average cost of production, which was the feasible “second-best” price that would enable the enterprise to break even in the long-run but minimise the distortion caused by pricing above marginal cost. An unregulated monopolist would price above long-run average cost and earn monopoly profits.

³⁰ David S. Evans and James J. Heckman (1984), “A Test for Subadditivity of the Cost Function with an Application to the Bell System”, *American Economic Review*, Volume 74, Number 4, pp. 615-623, questioned whether the Bell System was a natural monopoly in the provision of long-distance service. Shin, Richard T. and John S. Ying (1992), “Unnatural Monopolies in Local Telephone”, *Rand Journal of Economics*, Volume 23, Number 2, pp. 171-83, questioned this presumption of natural monopoly for local exchange services. Roller, Lars-Hendrik (1990), “Proper Quadratic Cost Functions with an Application to the Bell System”, *American Economic Review*, Volume 72, Number 2, pp. 202-10, offers a rebuttal to Evans and Heckman. At a theoretical level, contestable market theory claimed that even where the cost of production was minimised by a single firm, it may be possible for competition to discipline the prices of an incumbent firm, provided economies of scale arose from costs that were properly considered as fixed but not sunk. While this may have been a plausible claim in the context of industries with “capital on wheels” that can be repurposed to serving other markets, it does not seem a particularly plausible theory with respect to telecommunications, railroads, electricity networks or oil pipelines, where capital is most certainly sunk.

incentives for innovation.³¹ Although we frame these trade-offs as trade-offs between competition and cost minimisation or competition and innovation, more precisely they are trade-offs between competition policies that promote more entry into an established “market” and cost minimisation or innovation.

Importantly, policy and academic discussion of telecommunications services had, for a long time, recognised the potential importance of demand-side externalities, and the modification this required to standard competitive analysis. Rohlfs (1974) provided the pioneering formal analysis of inter-dependent demand in communications systems, emphasising the possibility that new products, characterised by externalities, would not reach critical mass absent pricing policies (including initial free offers of the product to users, followed by price increases once adoption was sufficiently high) that consciously guided consumers to the privately (for the provider) and socially optimal levels of adoption.³² Network externalities provided the rationale for the long-standing goal of universal telecommunications service, and also provided a rationale for cross-subsidies between user groups. Thus, it was believed, even if expansions of the telecommunications system were not justified on an incremental cost-benefit basis, they might be justified once the benefit to infra-marginal subscribers from adding marginal subscribers to the system was accounted for.

In short, while there are some particular emphases of the competition policy debate on digital platforms—in particular, the possibility of inefficient lock-in that we discuss below—many of the issues relating to trade-offs facing competition policy in relation to digital platforms have previously been raised in other industries. Economic policymakers have, on many previous occasions, had to confront trade-offs between competition and cost minimisation, between competition and innovation incentives, and between standard principles of competitive market pricing and adoption externalities. The social importance of (at least direct) network externalities has also been implicitly understood for at least a century and explicitly formalised for nearly half a century now. Rohlfs (1974) emphasised the need for conscious pricing strategies that guided the market towards privately and socially efficient levels of adoption. This type of consumer coordination via marked departures from marginal cost pricing is a critical aspect of platforms, and a critical source of controversy in antitrust cases involving platforms and platform pricing. In summary, it is nothing new for traditional competition policy principles to be tested in circumstances where there may be important advantages to tolerating and managing a certain and not insignificant degree of market power.

D. Network Externalities and Lock-In: Classic Competition Concerns in Platform Industries

With specific respect to platforms, the classic competition/antitrust concern is precisely around the issue of network externalities and the role that these play in entrenching a possibly inefficient equilibrium. This possibility emerged from the literature of the 1980s that much more explicitly dealt

³¹ Of course, there are additional complexities associated with regulation and patent law. Regulation might also be justified from an additional perspective, described well in Church and Ware’s industrial organisation text—where sunk costs are involved, problems of “hold-up” inevitably arise, and regulation may be viewed as a governance mechanism that mitigates the hold-up problem. In the context of patent law, there is also the question of the scope of monopoly rights—for example, there has been a long-standing debate about the efficiency of the “winner take all” nature of the patent system, with some claiming that innovation incentives would be preserved and deadweight loss reduced if the patent system based rewards to patentees on their incremental contribution relative to all alternatives including technologies that might infringe the patent but were independently invented. See Church, Jeffrey and Roger Ware (2000), *Industrial Organization: A Strategic Approach* (Toronto: McGraw Hill), Chapter 24 for a discussion of regulation as a means to mitigate endemic hold-up problems. See also Denicolo, Vincenzo and Luigi Franzoni (2010), “On the Winner-Take-All Principle in Innovation Races”, *Journal of the European Economic Association*, Volume 8, Number 5, pp.1133-1158, for a discussion of the optimal allocation of “prizes” for innovation.

³² Rohlfs, Jeffrey (1974), “A Theory of Inter-Dependent Demand for a Communications Service”, *Bell Journal of Economics*, Volume 5, Issue 1, pp. 16-37.

with systems that also featured indirect network externalities. Whereas telecommunications networks were characterised by direct network externalities—(roughly) that the value to a given user increased when there were more users of the same system— in the case of VCRs, the value to the user of choosing either a Betamax or VHS recorder depended also on the compatible content that was available alongside these systems. In turn, the incentive for content providers to develop or provide content for users of a particular VCR format depended also on the number of users of that system. However, as Schmalensee (2011) points out in the context of this literature:

Technology selection and product adoption were generally modelled as discrete, once-and-for-all decisions that typically produced winner-take-all results... most theoretical analysis showed that market outcomes with once-and-for-all competition and network effects could be seriously socially inefficient: buyers could find themselves selecting the wrong product or technology, and society could be locked into those bad choices for the foreseeable future.³³

The possibility of inefficient lock-in was also underscored in a different economic literature, dealing with “path dependence.” Arthur (1989) described how a small and fleeting advantage for a particular technology could have irreversible consequences (i.e., that path dependency was a potentially important factor in driving market outcomes) and those market outcomes might well be inefficient.³⁴ The paradigmatic example of such path dependence was the QWERTY keyboard design, which became a universal standard largely by a series of seemingly minor historical happenstances even though Arthur and others suggested that it was an inferior design to others such as the DVORAK keyboard. This alternative historical perspective on technological lock-in proved influential in shaping the U.S. government’s litigation against Microsoft in the late 1990s. Much more recently, concerns about “tipping” and market foreclosure continue to feature prominently in the competition policy debate. Thus, a recent survey notes:

[D]irect and indirect network effects plus economies of scale often give rise to ‘winner-takes-all markets’ or ‘tippy markets’ if many users find it difficult or unattractive to multi-home. As Katz has expressed in his expertise for the OECD: “Although the issues are particularly difficult, there are also reasons to believe that two-sided markets may be particularly fertile ground for exclusionary behaviour”. Similarly, Amelio, Karlinger & Valletti write: “Traditional exclusionary practices carry over to platform competition and in some circumstances indirect network externalities accentuate the incentive to foreclose by incumbents”.³⁵

[Footnotes omitted]

Other economic literature suggests a considerable degree of caution in accepting that digital markets necessarily warrant an especial degree of competition policy intervention. Schmalensee (2011) points out that the presumption of durable “winner takes all” effects is often defied by the experience of actual “platform” markets where network effects (direct or indirect) in adoption play important roles. One reason for this is multi-homing: people will often carry both Visa and Mastercard cards, or have Skype, Facetime and WhatsApp, and use all three simultaneously. He points out that contrary to

³³ Schmalensee, Richard (2011), “Jeffrey Rohlfs’ 1974 Model of Facebook: An Introduction”, *Competition Policy International*, Volume 7, Number 1, pp. 301-312.

³⁴ Arthur, W. Brian (1989), “Competing Technologies, Increasing Returns, and Lock-In by Historical Events”, *Economic Journal*, Volume 99, No. 394, pp. 116-131.

³⁵ Haucap, Justus, “Competition and Competition Policy in a Data-Driven Economy”, *Intereconomics: Review of European Economic Policy*, Volume 54, Number 4, pp.201-208, version available at <https://www.intereconomics.eu/contents/year/2019/number/4/article/competition-and-competition-policy-in-a-data-driven-economy.html>.

models that have assumed high switching costs, switching costs in many contexts appear to be moderate, and there are no long-lasting commitments that many Internet-based businesses require or could feasibly ask their customers to make. While the VCR market tipped towards the VHS format, there are two major and mutually incompatible operating systems for smartphones, that of Apple and that of Google. Despite the claim that even a modest early-mover or incumbent advantage can render markets non-contestable³⁶, Facebook had no difficulty in displacing MySpace, and even Google was by no means an early entrant into search. It is worth being cautious in accepting the proposition that consumer switching costs are necessarily especially high in the absence of any contractual barriers to switching. Importantly, even if there is the potential for lock-in and/or high switching costs in platform industries, the source of such lock-in may be the same as found in other contexts. For example, to the extent that Apple is able to “lock in” existing users to its IOS environment, this may simply reflect a well-differentiated product and not the tyranny of network effects. Apple, after all, has a much lower share (by units) of smartphone sales than does Android.

E. Weyl and White’s Critique

One of the more thought-provoking recent theories of platforms, in our view, comes from Weyl (2010) and Weyl and White (2014 and 2016).^{37 38} It is this relatively recent contribution that explicitly analogises between supposedly new-fangled digital platforms and the “natural monopoly” environment in the industries such as telecommunications that we have specialised in for nearly two decades. The key facets of this contribution are:

- *Network effects.* Consumers value platforms for the network effects that they deliver. Consequently, if more competition fragments the market, it may reduce the ability of any platform to deliver network effects to consumers.³⁹
- *Insulating strategies.* Weyl and White, echoing the earlier work of Rohlfs, point out that in platform industries, firms often adopt “subsidise usage now” strategies, with the aim of recouping their initial subsidisation later. For example, they suggest that in new markets, a platform such as Uber would find it optimal to offer reduced prices to reflect its smaller network of drivers, but as the network expands and quality increases, they can trade-off better service against increased price (an “insulating strategy” because the trade-off between increased network effects and increased prices insulates consumers from reductions in welfare). They suggest that the ability to adopt such pricing strategies explains why, in fact, several entrant platforms ranging from Uber to Amazon have been successful. Contrarily,

³⁶ For example, Haucap, *supra.*, cites to academic literature that shows that in the presence of economies of scale even a relatively small initial advantage can deny new entrants sufficient scale economies and thereby deter their entry.

³⁷ Weyl, E. Glen (2010), “A Price Theory of Multi-Sided Platforms”, *American Economic Review*, Volume 100, Number 4, pp.1642-1672. See also Weyl, E. Glen and Alexander White (2016), “Insulated Platform Competition”, working paper available at

<http://crm.sem.tsinghua.edu.cn/UploadFiles/File/201901/20190111112959757.pdf>. These papers are synthesised for policy purposes in Weyl, E. Glen and Alexander White (2014), “Let the Right One Win”, University of Chicago Law School, Working Paper No. 709, subsequently cited as “LROW.”

³⁸ We note that there is a vast literature on two-sided markets and platforms, especially focused on indirect network externalities and the consequent price response of platform operators in order to internalise these externalities and to subsidise the “side” of the market that generates these benefits. Now-standard references are Tirole, Jean and Jean-Charles Rochet (2006), “Two-Sided Markets: A Progress Report”, *Rand Journal of Economics*, Volume 37, Number 3, pp.645-667 and Armstrong, Mark (2006), “Competition in Two-Sided Markets”, *Rand Journal of Economics*, Volume 37, Number 3, pp.668-91. We direct the reader to these papers for further technical understanding of the merits of the arguments made by Weyl and White that we discuss here.

³⁹ Here, the authors cite to earlier work by Dybvig and Spatt (1983), which shows how a central authority can devise a taxation and subsidy structure that enables optimal adoption of a public good characterised by network externalities. Their paper is an elaboration and generalisation of this earlier work, particularly in allowing for users or consumers to be heterogeneous in their valuation of network effects. See LROW, pp. 4-5.

they suggest that the limits to adopting a successful “insulating” strategy are (a) the successful platform can, even after it prevails, be able to appropriate too low a share of available surplus to recoup its initial investment in achieving penetration; (b) capital markets (or other sources of financing) will not support this strategy if they lack sufficient appreciation of the market dynamics. Critically, the idea of insulating strategies—available to entrants—addresses the concern expressed in the literature and reflected in the Cremer Report discussed in Section 2—that consumer coordination is a critical barrier to entry.

- *Fragmentation rather than lock-in is the greater danger.* In their view, the availability of insulating strategies (with the caveats highlighted immediately above) greatly minimise the risk of inefficient lock-in. This is especially true, they state, because relatively passive “divide and conquer” strategies may suffice to allow platforms to achieve critical mass. They state “a more efficient but otherwise similar entrant may always use an insulating strategy to undercut the incumbent firm”, adding that this finding is supported by a large proportion of the theoretical literature on platforms which features “the claim that excess inertia [i.e., lock-in] is the theoretical exception rather than the rule.”⁴⁰ They claim that the same bias towards excessive entry that has been established in industries with economies of scale (see, e.g., the discussion on free entry above) applies to platform industries, but that the undermining of network effects exacerbates the inefficiency of such entry.⁴¹
- *Spence distortions.* Platforms are apt to distort the provision of network effects away from the socially optimal level. This is because, absent sufficiently rich instruments of price discrimination, a monopoly platform will base its pricing strategy on the marginal consumer’s valuation of network effects, and not on the average consumer’s valuation of network effects. Spence (1975) established the same incentive for an unregulated monopolist which would tend to either over-provide or under-provide the optimal level of quality, which thus provided a justification for quality-of-service regulation.⁴² This result, derived in an earlier paper by Weyl (2010), provides a theory of market failure and a rationale for corrective action by governments, in the context of platforms. For example, in some platform contexts such as newspapers, marginal readers of the New York Times may be “middle brow” in terms of their taste and tolerance for advertising, but infra-marginal (loyal) readers may have much lower taste and tolerance for advertising. In this case, the newspaper platform will charge too little (relative to the optimal level) to advertisers, and feature too much advertising (relative to the optimal level).⁴³

Weyl and White’s theory of insulating strategies directly challenges the idea that consumers will get locked into the “wrong” technology, pointing out that a key shortcoming of the literature that emphasises lock-in (e.g., Arthur, 1989) is its failure to account for adaptive pricing as seen in real-world platform markets (and as envisaged by Rohlfs as long ago as the 1970s). Further, the literature on technological lock-in tends to emphasise the failure of consumers to coordinate on the right technology, whereas Weyl and White—perhaps in common with the broader literature on two-sided markets—emphasise the coordination role of the platform operator. Weyl and White also challenge conventional wisdom on the role of competition, pointing out that competition could lead to more

⁴⁰ LROW, p.6.

⁴¹ Weyl and White point out that in platform contexts, excessive “business-stealing” entry not only raises average costs but might also raise marginal costs. Consequently, it is directly harmful to consumers. LROW, p.11.

⁴² Spence, A. Michael (1975), “Monopoly, Quality and Regulation”, *Bell Journal of Economics*, Volume 6, Number 2, pp. 417-429.

⁴³ A point often made in the context of platforms or industries driven by network effects is that these network effects often intensify “competition for the market.” However, Weyl and White suggest that where firms can adopt insulating strategies this is not true. This is because firms that adopt insulating strategies will offset the loss of indirect network effects with corresponding reductions in price, thus preventing a potential unravelling of the platform. See LROW, pp. 9-10.

fragmentation which leads to lower provision of network effects by any one platform. Importantly, competition does not solve the Spence distortion problem that they identify — “increased competition between incompatible platforms is unlikely to provide the appropriate counter-weight to distorted pricing incentives and, instead, would likely exacerbate the problem further.”⁴⁴

F. Non-Price Distortions and Regulation

Weyl and White’s emphasis on consolidation is at odds with what they (correctly) see as competition policy’s focus on maximising the number of firms in the market. They argue that platform markets are highly competitive even while being consolidated, because there is always the threat of displacement by a new platform (conditional on that platform being able to find the right insulating strategies, a problem that they believe is mostly rather surmountable). While competition policy enforcement remains important, they suggest that such enforcement should focus on preventing collusion between platforms—such collusion may take the form of dividing the market, and keeping it fragmented, while also keeping prices high—rather than on encouraging more entry.

But their most relevant observation is that around “letting the right one win”—subject to a process of learning about which platforms are most efficient, government policy in their view should move towards encouraging the market to tip towards the efficient platform. At the same time, they are careful to note that this neither obviates the potential for market failure (e.g., the Spence distortion) nor the need for regulation. They offer the example of standard-setting bodies, which do select at least marginally superior technologies, but also oblige the technology owners to make available the technologies on a fair, reasonable and non-discriminatory basis.⁴⁵ Governments and indeed private firms already engage in such selection processes through, for example, awarding exclusive franchises based on detailed consideration of multiple qualifying criteria and subject to binding ex-post commitments. They explicitly state that platforms are naturally monopolistic to an even greater degree than industries with economies of scale, and thus it is natural to think of the need for regulation in these contexts.⁴⁶

Most notably, they explicitly call for a regulatory framework to govern those areas of platforms’ activities that diverge from the interests of the public. In areas of critical concern to the public such as privacy and data protection, or political organisation and “norm-setting” that have strong public goods dimensions, there is limited reason to expect platforms to be able to manage matters in a way that coincide with the public interest. In other areas, such as the provision of service quality where there may be implications for the platform’s reputation and profitability, there may also be a greater likelihood that self-regulation by the platform will mitigate matters. However, even here the Spence distortion may play an issue—for example, consider the possibility that the value of the platform to one side of the market lies in the access to customer profiles that the platform provides. This might be true of professional networking platforms that allow recruiters or marketers to access CVs or professional profiles or health profiles for a cost. If there is an implicit or explicit price charged for such access, it may be too low or too high depending on the relationship between the marginal consumer’s valuation of such information relative to that of the average consumer. In this case, neither self-regulation by the platform nor competition between platforms is likely to provide the right balance between accessibility and privacy to consumers. In this case, the appropriate form of intervention may be regulation, but subject to the substantial caveat that the more subtle are the

⁴⁴ LROW, p. 11. Competition might lead to lower prices, which would straightforwardly increase network effects, by increasing adoption. On the other hand, competition will fragment the market and thus weaken the ability of platforms to provide their customers with network effects. They do discuss cases in which fragmentation may be socially optimal relative to consolidation, but even in these cases, they suggest (with formal reasoning) that the effect of competition in reducing the severity of the Spence distortion is very ambiguous.

⁴⁵ LROW, p.18.

⁴⁶ LROW, p. 21.

sources of market failure, the more likely it is that regulatory intervention will tend to create distortions that more than offset any corrective effect of regulation.

G. From Telecommunications Networks to Digital Platforms?

Weyl and White's discussion is particularly interesting to those analysts of platforms with a background in regulated industries, and an appreciation for the history of telecommunications and its regulation. From our perspective, the key themes that they emphasise are (a) potential tensions between competition and the provision of network effects; (b) a potential tension between appropriability and policies that aim to prevent dominant firms from arising; (c) the inability of competition to correct distortions in the provision of optimal quality of service; and (d) their relative faith in the ability of entrant firms to find appropriate strategies to win a sufficiently large customer base. These have strong echoes in regulatory debates and competition policy in the telecommunications industry over the course of a century. Specifically:

- Their concern about biases towards excessive entry and fragmentation are echoed in the economic literature relevant to industries with large entry costs and scale economies. Equally importantly, these concerns have informed an influential strand of regulatory thinking in telecommunications (i.e., there has historically been and still is a concern regarding potentially inefficient entry and duplicative investment);
- Their discussion of network effects finds echoes in the earlier work on universal service and network externalities in telecommunications markets;
- Their discussion of the ability of entrants to win market share without a “helping hand” from regulation or from competition policy that impinges on incumbent firms' conduct finds echoes in the long-standing debate on inter-platform competition versus access regulation in the telecommunications industry;
- Likewise, the danger that policy designed to bolster competition may provide the wrong incentives regarding network investment remains a major focus of economic analysis of regulation and competition policy in telecommunications.

The competition policy debate on platforms, in essence, has considerable broad similarities with the regulatory and competition policy debate in telecommunications (and a broader competition policy debate on static efficiency versus dynamic efficiency):

- In the telecommunications debate, some analysts posit faith in inter-platform competition and technological change to deliver dynamically efficient outcomes. They argue that actual and potential future substitution to different communications or broadband platforms disciplines the market power of incumbent firms.⁴⁷ Analogously, Weyl and White and other analysts suggest that competition for the market via means such as insulating strategies means that high market shares are not signs of dominance in the usual sense;
- In the telecommunications debate, the idea of natural monopoly—which is very much central to Weyl and White's argument—was the dominant idea of how the telecommunications industry ought to be organised for most of the 20th century. The broader idea of limits to free entry generated by sunk set-up costs and the resulting scale economies remains influential in shaping the current debate about realistic industry structure;
- The telecommunications industry has witnessed efforts both at market-mitigating regulation and market-shaping regulation. Traditional price regulation aimed to mitigate the consequences of market power. By contrast, since the 1980s, ex-ante regulation in the United States (until 2003) and Europe (to the present day) focused on market shaping remedies—access regulation and even vertical separation of incumbents were pursued vigorously so as to

⁴⁷ Teece, David J and J.G. Sidak (2010), “Innovation Spill-overs and the ‘Dirt Road’ Fallacy”, *Journal of Competition Law and Economics*, Volume 6, Issue 3, pp.521-594.

promote entry by new operators, of whom it was one day hoped that they would provide sustainable facilities-based competition (the “stepping stone” or “ladder of investment” concept). This type of regulation aimed at promoting competition in the downstream market, with the twinned hopes that such competition would discipline downstream prices and eventually resulted in increased upstream competition. In the case of platforms, Weyl and White set themselves up as proponents of a type of *market-mitigating* regulation (although our understanding is that they are not promoting anything like as pervasive a framework of regulation as was applied to the Bell System) whereas some others such as the U.K.’s Furman Review recommend measures such as inter-operability and data openness as part of a regulatory framework that *shapes* the market.

Telecommunications networks are characterised by scale economies and network externalities which limit the extent of efficient entry in the market. In other ways, however, they are not platforms. The conventional telecommunications network is not usually thought to exhibit indirect network externalities, and pricing is not of the two-sided variety. A two-sided market analytical framework has been applied to issues such as call termination rates. However, the two-sidedness is related to the arrangements for inter-carrier charging rather than the underlying nature of telecommunications networks.

While two-sided markets may have emerged in a world in which ISPs could differentiate themselves by the content that was available to their subscribers, in practice this has not happened for a number of regulatory and commercial reasons. Clearly, any analogy between telecommunications and platforms is an imperfect one. Nonetheless, it seems that the history of policy interventions in telecommunications can, at a minimum, provide useful insight into the efficacy of “market-shaping” regulation—regulation with an end-goal of affecting the structure of the market—in the context of an industry where the natural economic forces at work suggest that a high probability suggest that such intervention may have limited success. Further, it affords an opportunity to examine the relative efficacy of market-shaping interventions against reliance on exogenous technological or business model developments as a means of ensuring long-run competition. In our view, such “market-shaping” interventions under the aegis of an ex-ante regulator are more similar in spirit to competition policy concerns about allowing markets to become concentrated than to the traditional utility regulation rationale of managing the consequences of an inevitably concentrated market. Of course, competition policy interventions also concern themselves with the extension or leveraging of market power to adjacent markets, but such interventions may co-exist alongside a tolerance of a concentrated market structure in the primary market (which provides the source of the leverage).

A final limitation of our analysis of telecommunications is that it cannot directly illustrate whether some form of market-shaping intervention or traditional market power regulation would be the optimal response in a technologically stable environment (i.e., an environment analogous to one in which the threat of replacement by a new platform is moot). There was a relatively high degree of technological stability—i.e., a low threat of replacement of the copper-wire public switched telephone network by a new technology—during a large stretch of the 20th century. Yet during this period nearly all countries adopted either state ownership or natural monopoly regulation as the means to organise the telecommunications industry. We cannot thus tell whether, given the lack of competition from new technologies, there would have been an alternative, more “pro-competitive” way of organising the industry that could have achieved better results.

Section IV: The Historical Experience of Telecoms

In this section, we attempt to extract some lessons from the historical record of telecommunications policy and regulation. The United States, distantly followed by the United Kingdom, has the longest historical record in this regard. Consequently, the U.S. experience is the richest one, with several

examples of changes in regulatory philosophy as well as several examples of technology-induced change. We thus begin with the U.S. experience.

A. The United States

In the beginning, there was Alexander Graham Bell. Bell narrowly (by a matter of a few hours) won broad patent rights covering the transmission of speech over electrical wires. Bell's patent monopoly lasted for twenty years, during which time the eponymous telephone company had a monopoly in provision of telephone service. Facilities competition in local and long-distance telephone markets developed quickly. Competitors were vertically integrated and aimed to bypass Bell/AT&T in long distance markets. Competing networks were typically not interconnected.

AT&T responded aggressively, prices fell steeply, and AT&T's profits collapsed but the lower prices fuelled rapid expansion in telephone penetration and usage. In this sense, facilities competition worked. On the other hand, independent facilities competition without universal interconnection also meant the industry was fragmented.

Major planks in AT&T's response to competition were to refuse interconnection⁴⁸ and to acquire independent competitors (networks and equipment manufacturers). In parallel it argued publicly that competition caused the duplication of fixed investments, which was unnecessary and wasteful. It also argued that a single 'natural' monopoly, protected from competition, would deliver higher quality, reliability and coverage (Woroch, 2002: 650).⁴⁹ This resonated with observers and leaders of 'public opinion' (Woroch, 2002: 643). It also resonated with business customer concerns over the expense and inconvenience of having to subscribe to multiple networks (Woroch, 2002: 646). But AT&T's acquisitions of independent competitors triggered several antitrust and pricing lawsuits. The federal government was also actively considering nationalising long-distance markets.

In 1913 AT&T mitigated these legal and regulatory risks with a commitment to the federal government to stop acquiring independent competitors.⁵⁰ AT&T nevertheless continued to acquire independent local competitors, garnering support from business customers seeking unified service. It also found support among state regulators aligned to idea of a natural monopoly. The widespread buy-in and subsequent pervasive influence of AT&T's natural monopoly theory provide an interesting historical example of a circumstance in which regulators and economic policymakers have opted for management of the consequences of an intrinsically concentrated market structure rather than opting for more entry. A major debate erupted in the 1970s and 1980s, as Section 3 discusses, as to whether the natural monopoly theory of the industry was ever right. However, it seems fairly obvious that facilities-based competition is a very "small numbers" game, as the only sustainable entrants into local telephony and broadband have been cable and mobile/wireless companies, which offered very

⁴⁸ Woroch (2002: 646) states that new entrants needed interconnection and collocation to succeed. He also states that that AT&T refused interconnection as part of its response to competition (pg. 649). Mueller (1997: 6, 9-10) states the opposite, i.e., that entrants did not seek to interconnect with each other but rather to cover as much of the US as possible with their own networks. Mueller (1997: 13) also points out that interconnection wasn't always possible due to technological incompatibility.

⁴⁹ While AT&T introduced the notion of universal service under monopoly, the term did not mean then what it means today. Mueller (1997, chapters 2, 8 and 13) explains that, for AT&T in the early 1900s, universal service meant a universally interconnected single network and provider to overcome the fragmentation caused by competing independent networks that refused to interconnect with each other. It was an antonym to the 'dual service' system that existed under free facilities-based local competition. "Universal service meant consolidating the competing telephone exchanges into a local monopoly so that all telephone users could be interconnected. It did not mean a telephone in every home, or government policies to subsidize telephone penetration or affordability" (Mueller, 1997: 10).

⁵⁰ Referred to as the Kingsbury Commitment (Mueller, 1997, chapter 10). AT&T also committed to open long-distance lines to independent exchange more than 50 miles away from Bell exchanges, and to divest its interests in Western Union (telegraph). Western Union had already divested from AT&T previously.

well-differentiated products. Equally interestingly, it appears that part of the impetus for accepting the natural monopoly idea came from business customers.

The U.S. had by the mid-1930s adopted many of the institutions of economic regulation that we are familiar with at a global level today, with the FCC being established in 1934. The development of economic regulation happened in parallel with the emergence of the Bell System (which term we use interchangeably with “AT&T”). By the mid-1930s, AT&T accounted for about 80% of local markets including all urban centres, and 100% of the long-distance market. The remaining independent local telephone companies served smaller towns and rural areas.⁵¹ The basic picture remained substantially, but not wholly, unchanged until 1982.

Since the early 1980s, however, the U.S. has seen a number of regulatory policy innovations, reflecting significant changes in regulatory philosophy over the decades, but also reflecting the advance of technology and of economic theory. Overall, the U.S.’ regulatory regime has had three identifiable eras with three distinctive regulatory philosophies:

- *Market-mitigating regulation.* The US had a long period of regulated monopoly in the telecommunications industry, stretching from the 1930s into the 1990s (when competition in local telecommunications markets was opened up more decisively). During the last half of this period, however, technological change began to intrude on AT&T, and in turn, led to pressure for regulatory change. The most decisive break came, of course, with the breakup of AT&T in the early 1980s.
- *Market-shaping regulation.* This phase lasted from the early 1980s to the early 2000s. The two major innovations of this era were the breakup of AT&T and the Telecommunications Act of 1996, and especially the unbundling mandates that were part of the act. The common thread running through the structural separation of AT&T and the Telecommunications Act of 1996 was the belief that competition policy (of the structural remedies variety) and regulatory policy could identify and isolate “bottleneck” assets within historically integrated supply chains, and by focusing regulation on those bottleneck assets, rely on competition to discipline prices in other markets. In the case of unbundling mandates, the goal of encouraging competition in services was predicated on the hope that this would provide a stepping stone to competition in the local loop itself.
- *Deregulation.* Since the mid-2000s, the U.S. has relied primarily on inter-modal competition, initially between cable networks (who started providing telephony and Internet services in the late 1990s) and integrated telecom companies such as AT&T and Verizon, and now between these companies and wireless carriers. Antitrust enforcement, most notably with respect to mergers in the wireless industry, has remained in place. Further, there has been a highly politicised debate with respect to the issue of net neutrality regulations—the Obama-era FCC pushed for such regulations, while the Trump-era FCC abolished them. As explained below, the net neutrality regulations proposed by the Obama-era FCC can be interpreted as a market-protecting intervention

The AT&T Era

It is very difficult to assess whether the U.S.’ era of natural monopoly regulation was a success or failure. It would not be legitimate to do so by resorting to a comparative exercise which compares two different eras with very different underlying rates of exogenous technological progress. The achievement of more or less universal mobile device penetration in the United States (and elsewhere) took less than two decades, whereas it took until roughly 1970 to achieve 90% penetration (by household) for fixed-line telephone service. However, this much slower diffusion of fixed-line telephones almost certainly reflects exogenous factors—given the technologies and complementary

⁵¹ Woroch (2002), p.650.

infrastructure available to construct telephone networks over a vast geography in the middle of the 20th century, would an alternative regulatory structure have achieved dramatically faster diffusion? There may be an argument that AT&T's monopoly in areas such as manufacturing telephone equipment retarded innovation, and indeed it was precisely this possibility that led to the landmark *Carterfone* decision in 1968 requiring telephone companies to allow the attachment of equipment not manufactured by AT&T's Western Electric subsidiary. However, against this Noam (2008) points to the widespread perception that the US telecommunications industry was the world leader.⁵² It is also true that the innovations made by Bell Labs within the context of the overall Bell System were highly noteworthy: the transistor, the laser, programming languages such as Unix, and nine Nobel Prizes speak to the importance of Bell Labs as a hub for mid-century innovation whose benefits are felt to this day. An even broader case can be made the integrated corporate behemoths of the mid-20th century were a more fertile breeding ground for economically transformative innovation than today's much leaner and more fragmented environment. Arora et. al. (2019) make the following observation:

*Small firms and university technology transfer offices cannot fully substitute for corporate research, which had integrated multiple disciplines at the scale required to solve significant technical problems. Therefore, whereas the division of innovative labor [sic] may have raised the volume of science by universities, it has also slowed, at least for a period of time, the transformation of that knowledge into novel products and processes.*⁵³

In summary, it is impossible to tell whether the US telecommunications industry would have developed in a more effective or less effective fashion under an alternative regulatory regime with much stricter line-of-business restrictions on AT&T, and perhaps with mandates to open up key aspects of the AT&T system to competition. We lack the means to make the only valid comparison—which is with a similarly well-developed economy that adopted something like the “pro-competition” approaches of the last quarter of the 20th century— of relative performance of the regulatory regime that was adopted for AT&T. We merely note that the totality of AT&T's contributions to the US economy and US innovation was very significant. Even as late as 1980, many developed West European economies had substantially lower fixed-line penetration than the U.S. did, e.g., France had 29 lines per 100 population in 1980, whereas the US penetration level was already around 42 lines per 100 population. We also note that the impetus and pressure for consolidation apparently came not just from AT&T itself but from governments and business customers. Thus, the idea that there were important economies and efficiencies associated with a large, integrated national-scale operator had widespread currency, and seems justified by the re-coalescence of such entities in the 2000s.

The Market-Shaping Era: The AT&T Separation and the 1996 Telecommunications Act

This national monopoly would remain until 1982, although not completely intact. Technology advanced and entry into long-distance markets occurred in the late 1970s. Specifically, MCI entered long-distance markets using microwave technology. This triggered a chain of events that led to MCI being able to compete directly against AT&T in switched voice services by 1977—using a combination of its own microwave technology, circuits leased from AT&T, non-AT&T terminal

⁵² Noam, Eli M. 2008. "Did AT&T Die in Vain? An Empirical Comparison of AT&T and Bell Canada," *Federal Communications Law Journal*: Vol. 61: Iss. 1, Article 8. Available at: <http://www.repository.law.indiana.edu/fclj/vol61/iss1/8>

⁵³ Arora, Ashish, Sharon Belenzon, Andrea Pataconi, and Jungkyu Suh, “The Changing Structure of American Innovation: Some Cautionary Remarks for Economic Growth”, NBER Working Paper No. 25893.

equipment (made by Nortel, in Canada), and the right to interconnect with the AT&T telephone network.⁵⁴

After a lengthy antitrust investigation and trial, AT&T was structurally separated in 1984. It became a stand-alone competitor in long-distance. Its former local operating companies were grouped into regional independent operators ('phone companies') that retained some monopoly rights and were barred from entering long-distance. The concern leading to this historic intervention was that the vertically integrated AT&T was able to leverage its "bottleneck" local loop monopoly into the long-distance and equipment markets. The Department of Justice (DoJ) believed that effective competition was possible at least in these two latter markets and should be allowed to flourish.⁵⁵

The structural separation of AT&T might be seen as an effort to prevent a dominant firm leveraging its "natural" market power into an adjacent market. However, given that local and long-distance companies quite naturally reintegrated when they were given the regulatory leeway to do so, and given that other countries (most especially the closest comparator country, Canada) do not seem to have emulated the DoJ's move, the separation of AT&T can also be viewed as an ambitious market-engineering effort, which might have overlooked the important economies of integration involved in providing the relevant services. Inasmuch as it attempted to isolate "contestable" and "non-contestable" segments of hitherto tightly integrated supply chains, it bears similarities to not just the lighter-handed functional separation of British Telecommunications (BT) Plc in the 2000s, but also to the philosophy behind regulatory efforts to substitute retail regulation with a combination of wholesale access regulation and retail competition. The salient difference between the unbundling mandates of the 1990s and subsequently, and the AT&T separation, is that the former policies were explicitly justified by reference to an end-goal of competition in the primary or upstream market.

Was the AT&T Separation Successful?

Was the AT&T separation a success? The evidence is that long-distance competition increased and long-distance rates declined, and as separation was squarely aimed at these market segments, a simple timeseries analysis would suggest that the separation was successful. Lower prices and profitability in long distance markets also triggered increased competition in local markets. Long-distance carriers needed to find ways to bypass the access fees of ILECs, stimulating demand for the services provided by CAPs to business customers.⁵⁶

However, a substantial body of comparative and historical evidence (Noam, 2008, Crandall, 2005 and 2007), and the benefit of hindsight suggest that the AT&T separation had no lasting impact on the industry, that it may have resulted in creating a structure that complicated the subsequent broader introduction of competition in all telecommunications market, and that successful outcomes were achieved with far more minimalistic measures in other countries.

⁵⁴ McNamara, J. 1991. *The Economics of Innovation in the Telecommunications Industry*. New York, New York. Quorum Books, p.35.

⁵⁵ It is not clear whether the DoJ thought local market competition was also possible. The independent local phone companies created by the settlement were not barred from entering each other's territories to offer local access services, and AT&T itself was not barred from entering these local markets either. But no local phone company could really compete in another local market since it would be able to offer only a local service there, and not the bundle of equipment, long-distance service, and local service needed to be competitive. See Woroch, G. 2002. "Local Network Competition." In M. Cave, S. Majumdar, and I. Vogelsang, eds., *Handbook of Telecommunications Economics*, Volume 1. Amsterdam: Elsevier. Chapter 15, pp 641 – 716, at p.653.

⁵⁶ *Ibid.*

- The FCC kept AT&T's long-distance rates high and above incremental costs in order to cross-subsidise access pricing in the name of universal service promotion.⁵⁷ This created excessive incentives for “cream-skimming” entry into long-distance. Further, when the FCC reduced switched access rates from 1992 onwards, it resulted in a substantial decline in long-distance rates, and a substantial intensification of competition
- Effective competition in long-distance could have been realised merely by allowing entry and requiring the local phone companies to provide all competing long-distance providers with equal access to their customers (i.e. non-discrimination). Canada and several European countries experienced the same or greater success in promoting long-distance competition by implementing this change; none of them separated the incumbent in the same way as the United States did. Long distance prices in those countries fell faster than they did in the US after the separation of AT&T.⁵⁸
- Noam (2008)⁵⁹, via the means of a comparison between the US experience and that of Bell Canada, presents a raft of empirical evidence that the separation of AT&T provided limited additional benefits to competition, prices, shareholders, labour, innovation, among other categories, over and above what could have been achieved with less-intrusive reform.
- The United States could have had wireless services perhaps 10 years before it actually did.⁶⁰ As it turned out the advent of wireless service, alongside the growth in fibre networks (many of which were competitively provided), were to render the business models of independent long-distance companies unviable by the early to mid-2000s. Subsequently, local phone companies—the Baby Bells—were allowed to re-enter long-distance markets, and long-distance service as a concept has essentially died. This was inevitable when wireless operators in the US began offering unlimited nationwide calling at a fixed price.

At the same time, separating AT&T was costly. It took two years to complete and cost billions of dollars in lost output and reduced total factor productivity as the restructure unfolded.⁶¹ Crandall concludes that, “The AT&T case was brought as the result of a regulatory failure, not a market failure, and the very large costs of breaking up AT&T could have been avoided.”⁶² The comparative analysis of long-distance market outcomes across different countries suggests that even if long-distance service had remained a recognisable service in its own right, competition in its provision could have been achieved with less intrusive measures than separation. Further, the swift reintegration of local and long-distance operations in the early 2000s suggests that economies of integration were indeed important. Most importantly, the AT&T separation seems like a distant historical footnote today, and not the epochal change that it was thought to be at the time, because technological progress swiftly upended its basic assumptions. Finally, Noam (2008) makes the further point that after the AT&T separation, the US was never again the global leader in telecommunications that it once was. The spinning-off of Bell Labs into what subsequently became Lucent Technologies might even be

⁵⁷ Crandall, 2005, pp. 8-9.

⁵⁸ Crandall, 2005, Figure 2.

⁵⁹ Noam, Eli M. 2008. "Did AT&T Die in Vain? An Empirical Comparison of AT&T and Bell Canada," *Federal Communications Law Journal*: Vol. 61, Number 1, Article 8.

⁶⁰ Hausman, Jerry A., “Mobile Telephone”, Chapter 13 in Cave et. al (2000), *supra.*, pp.563-603. Hausman estimates that regulatory delay in devising an appropriate system of licensing effectively pushed serious deployment of mobile telephony back from the early 1980s to the early 1990s in the US.

⁶¹ Crandall (2007), Slide 10, estimates that the costs of adjusting to the restructuring decree amounted to over \$5 billion in lost productivity in 1984-85 alone.

⁶² Crandall, 2005, p.3.

something of a cautionary tale: it is not difficult to find scientists who express the view that the “dispersion of so many great researchers” was a loss to the US and global scientific communities.⁶³

The 1996 Telecommunications Act and the US Experiment in Unbundling

Soon after the separation of AT&T, policy and regulation turned to promoting competition in local markets too. Inter-modal facilities competition in local access had already begun to emerge in the early 1980s, facilitated by the advent of fibre technology. So-called competitive access providers (CAPs) laid fibre networks in high demand local markets to connect business users directly to long-distance networks via private lines, bypassing incumbent local exchange carriers (ILECs). These companies became full-fledged competing local exchange carriers (CLECs) in the late 1980s when state regulators allowed to interconnect with ILECs as competitors not customers. In some cities CAPs made significant inroads into ILEC market share in the 1980s.⁶⁴ The big CAPs were major operators. The largest, Teleport, built 50 fibre rings around cities in North America, Europe and Asia.

The passing of the 1996 Telecommunications Act greatly accelerated CLEC entry. It was designed with two broad ideas in mind. First, the emergence of digital access technologies (fixed and wireless), and the internet, needed to be supported. Legislators wanted to promote convergence in local access (i.e., inter-modal competition) particularly in internet access. Broadband internet access offered the potential for phone companies, cable operators and wireless operators to compete for individual users with similar bundles of services (i.e. combinations of voice, broadband, and media). Accordingly, the Act separated ‘traditional’ telecommunications and ‘information’ services and sought to regulate the former but not the latter.

Second, even though the prospect of strong inter-modal competition in access promised an end to the need to regulate local phone companies, competition in local markets for switched voice access could be strengthened by promoting both facilities and service competition, the latter based on the unbundling of ILEC networks.⁶⁵ Broadly, this meant that local markets for switched voice were targeted for pro-competitive regulatory intervention, while other forms of local access (cable, wireless) were largely left alone. Finally, traditional local phone companies were permitted to enter the video business for the first time.

Of special importance to our viewpoint is regulators’ belief that services-based entry was a “stepping stone” to facilities-based competition. US regulators were clear in their goal that services-based entrants would graduate to facilities-based competition: “The mandatory sharing of facilities is thus the segue to eventual competition between rival infrastructures or platforms.”⁶⁶

Facilities-based competition therefore was and continues to be held up as the end-goal of telecoms regulation. In practice, such competition tends to emerge when technology enables it to do so and not as a result of regulatory policy.

The US’s actual experience with unbundling offers few, if any, positive examples of migration towards facilities-based competition. The biggest users of the unbundling regulations in the late

⁶³ See Tenner, Edward “The Physics Nobel and the Fate of Bell Labs”, *The Atlantic*, October 16th, 2009.

⁶⁴ Woroch (2002), at p.646.

⁶⁵ Ehrlich, Everett (2014). “A Brief History of Internet Regulation.” Progressive Policy Institute. Washington, DC.

⁶⁶ Hausman, Jerry A. and J. Gregory Sidak, “Did Mandatory Unbundling Achieve Its Purpose? Empirical Evidence from Five Countries.” *Journal of Competition Law & Economics*, Vol. 1, No. 1, pp. 173-245. Available at SSRN: <https://ssrn.com/abstract=623221> or <http://dx.doi.org/10.2139/ssrn.623221>

1990s were in fact AT&T and WorldCom – the two major providers of long-distance switched voice services⁶⁷ - who became the biggest Competitive Local Exchange Carriers (CLECs).

The 1996 Telecommunications Act did offer a pathway to entry into long-distance markets by the Regional Bell Operating Companies (RBOCs) or “Baby Bells.” Such entry would be conditioned based on satisfying criteria for interconnection and access to rivals that was detailed in Section 271 of the Telecommunications Act. AT&T and WorldCom were concerned that the RBOCs would be able to persuade state regulators that they should be allowed to integrate into long-distance service, a goal that the RBOCs achieved between 2002 and 2004. AT&T’s and WorldCom’s pre-emptive defensive strategies quickly took advantage of the unbundling regulations to greatly expand their entry into local markets across the country. They also acquired the two largest CAP networks in this period.⁶⁸

These efforts largely did not work as intended. By 2003, before AT&T and WorldCom were acquired by SBC and Verizon, CLECs accounted for 15% of local access voice lines and less than 6% of DSL lines (Hausman and Sidak, 2005). In 2004, a court decision required the FCC to reverse some of the line sharing and unbundling regulations which had facilitated much of the CLEC entry. AT&T and WorldCom promptly exited the residential market and were acquired within two years.

Outside of a class of small CLECs narrowly focused on serving small businesses in limited geographic areas, very few of the stand-alone CLECs survived, regardless of whether their entry strategies focused on building a network or leasing from ILECs. This includes the [[DLECs,]] all of which were either bankrupt or in significant financial distress by 2004, and collectively accounted for only 3% the broadband market (Crandall and Waverman, 2006). Excluding the CLEC operations of the large diversified communications providers⁶⁹, the market capitalisation of the publicly traded stand-alone CLECs fell from approximately US\$100bn to US\$5bn between 1999 and 2004 (Crandall and Waverman, 2006).

In addition, cable companies did not push strongly into this market (Ehrlich, 2014: 6). While these companies passed more than 90% of US households and were connected to 60% of them, they accounted for only between 15% and 18% of CLEC voice lines by 2004.⁷⁰ There is also little evidence that CLEC entry reduced market prices or sparked investment by ILECs, and there is no evidence that service-based CLEC entrants graduated to facilities-based competitors (Hausman and Sidak, 2005).

Other than small stand-alone CLECs focused on small business, the survivors of this process were mostly large and vertically integrated and diversified (i.e., the local phone companies, which were by this stage active in long-distance, DSL, and wireless), and were soon to add media content; and cable companies, which were active in TV, cable broadband, and traditional and digital voice.

The U.S. experience suggests that specialized local carriers, long-distance companies, or unintegrated DSL providers will not generally be able to compete against integrated communications companies. The United States is very close to the end of a costly experiment in regulatory promotion of entry. At least 90 percent of the \$60 billion or more in capital expenditures by CLECs has been written down, written off, or otherwise discarded. The real competition between cable television companies,

⁶⁷ Crandall, Robert and Leonard Waverman (2006), “The Failure of Competitive Entry into Fixed-Line Telecommunications: Who is at Fault?”, *Journal of Competition Law and Economics*, Volume 2, Issue 1, pp. 113-148.

⁶⁸ MFS was acquired by Worldcom in 1996 and Teleport by AT&T in 1998.

⁶⁹ Namely, the long-distance carriers like AT&T and WorldCom, and the cable companies like Comcast and Cox.

⁷⁰ They provided approximately 3.7m out of somewhere between 25m and 30m CLEC voice lines (15%-18%) at the end of 2004. Estimate based on data in Crandall and Waverman (2006).

integrated wire-based telecommunications companies, and wireless (cellular) carriers is just beginning.⁷¹

The 1996 Telecommunications Act also distorted inter-modal competition in broadband. The attempt to separate traditional telecommunications and information services immediately led to problems with definitions. One result was that the broadband offerings of cable companies carried a lighter regulatory burden than the competing copper-based DSL offerings of the local phone companies.

Unsurprisingly, cable operator network investment (fibre and digital) grew rapidly after 1996 and cable companies were the first to launch high speed broadband a few years later. By contrast, some observers argue that incumbent firms' incentives to invest in DSL were distinctly muted during this time period.⁷²

Although the subsequent rolling back of unbundling mandates in the United States has been controversial too, and many observers have held that other countries that have persisted with access regulation (or “unbundling”) have had better outcomes than the United States in terms of broadband penetration and affordability, the US' own experience with unbundling offers no suggestion that the policy—at the time it was implemented, which was primarily with the promotion of narrowband competition in mind—was a success. Instead, it was competition from differentiated technologies such as cable and then wireless networks that drove the uptake of new services—broadband, mobile and integrated “triple play” or “quadruple play” packages—and sparked responsive investment by incumbent operators.

Thus, both major market-shaping interventions of the last quarter of the 20th century—the AT&T separation and the unbundling mandates pursuant to the 1996 Telecommunications Act—were superseded by the changing face of the telecommunications industry in the broadband era. The changes, of course, were technologically driven.

The Era of Deregulation

The FCC's 2003 Triennial Review and a series of related decisions fundamentally changed the approach to access regulation of wired broadband technologies. Fibre was exempted from loop unbundling. Broadband delivered over cable was exempted from all regulation. Line sharing obligations were abolished. DSL was eventually reclassified as an “information service” (and thus effectively exempt from unbundling rules) and the IP-based services of the local phone companies were no longer subjected to non-discrimination requirements.⁷³

The next few years saw a substantial and undoubted increase in investment in advanced DSL and fibre broadband networks, as well as substantial investment in new wireless networks and the continued upgrade of cable broadband networks to offer what were then considered “ultra-high” speeds (e.g., 50 Mbps).⁷⁴ The most notable investment was by Verizon, which made a very large

⁷¹ Crandall and Waverman (2006), p.125.

⁷² Hazlett, Thomas and Anil Caliskan (2008), “Natural Experiments in U.S. Broadband Regulation”, George Mason Law and Economics Research Paper, No. 08-04.

⁷³ Marcus, S. and Elixmann, D. (2010), “International regulatory comparisons: the evolution of IP-based fiber.” In Gentzoglani, A. and Henten, A. (2010), *Regulation and the Evolution of the Global Telecommunications Industry* (Cheltenham, UK and Northampton, MA: Edward Elgar).

⁷⁴ Hazlett and Caliskan (2008), *supra.*, analyse three distinct phases of US broadband regulation—the first phase in which cable investments were unregulated but DSL investments were regulated (prior to Q1 2003); the second in which line-sharing rules for DSL were abandoned, but other unbundling regulations remained in place and the third phase in which DSL was reclassified as an information service and effectively unregulated. They suggest that the trend growth rate of incumbent DSL services (in terms of the number of subscribers) increased dramatically as deregulation progressed, suggesting that incumbents had much stronger incentives to push DSL than they did in the era of wholesale access regulation.

commercially based deployment of Fibre-to-the-Home (FTTH) technology, a feat particularly notable given the mid-density nature of the suburban United States where these investments were principally made.⁷⁵

By about 2010, and continuing to this day, there has been persistent controversy over where the United States stands in the international broadband stakes. In the initial years following deregulation, US operators consistently invested more than their EU counterparts, and initially, EU incumbent operators did not make the types of investment in next-generation fibre networks that US operators such as Verizon did.⁷⁶ In contrast to 2G and 3G deployment, where the US was seen as a laggard compared to Europe, the US was an early and leading adopter of LTE technology.

At the same time, comparisons of prices and adoption levels paint a less flattering picture of the US' broadband performance compared to other developed countries. However, it should be noted that such comparisons are inherently difficult to make because of significant differences in the way telecom services were packaged to consumers.⁷⁷ Factors such as the greater cost of deployment in the United States relative to higher-density nations with shorter “loop lengths” would drive up both investment levels per line but also drive up end-user prices. The need to compete with cable broadband operators may also have compelled the US incumbent operators to invest relatively early in fibre, especially as long loop lengths in the US constrained DSL speeds. Demographic factors and greater levels of inequality in the US may also have limited broadband adoption to some degree. Quite likely, the failure to adequately control for these broader cost, demographic and marketing effects produce a flattering picture of the impact of the US' relatively unique deregulatory path on investment, but equally exaggerate its supposedly negative impact on penetration and pricing.

More pertinently, the extensive debate on the comparative performance of US broadband contrasts a deregulatory approach with access regulation. However, the possibility that the US could have maintained high investment levels in new technologies while perhaps either subsidising or regulating the prices of broadband in some of its higher-cost locales is generally not explored. This alternative possibility would be more consistent with the market-mitigating regulation that we discussed above.

Finally, it would be remiss to suggest that regulation of the US telecommunications sector has not been a heated issue since the early 2000s. Most notably, there was a sustained controversy around network neutrality rules, which have generally been favoured by Democrats and opposed by Republicans. The FCC's Open Internet Order of 2015 paved the way for “Title II regulation”—i.e., utility regulation—of the Internet, which allowed FCC oversight over discriminatory terms of service (e.g., the potential for ISPs to set up “fast lane” and “slow lane” broadband packages). The reconstituted FCC under the Trump Administration overturned the decision as soon as it could. Since then, the Courts have ruled that while the FCC can reclassify Internet service as it sees fit, it cannot block state-level efforts to enforce net neutrality. The net neutrality debate is beyond the scope of this paper, and in any case, we do not have a historical or comparative record to analyse. It is interesting to note that the particularly intense concerns over net neutrality in the United States are linked to concerns about the concentrated structure of the upstream market, for ISP services, but that

⁷⁵ As of 2008, estimates were that Verizon would end up spending \$23 billion on its FTTH investment, which was viewed as a highly risky proposition—in light of the much lower costs that cable networks faced in offering the same speeds using Docsis 3.0 technology. See Hansell, Saul (2008), “Verizon's FiOS: A Smart Bet or a Big Mistake”, *New York Times*, August 18th, 2008.

⁷⁶ NERA Economic Consulting (2015), “Broadband Market Performance in Canada: Implications for Policy”, Report filed for Bell Canada in CRTC Proceeding 2015-134. Pages 35-38 present various measures of investment intensity for the telecommunications industry in OECD countries. Canada and the United States appear to have had significantly higher levels of investment per capita than most of the European Union.

⁷⁷ See, for example, George S. Ford (2009), “Be Careful What You Ask For: A Comment on the OECD's Mobile Price Metrics”, Phoenix Center Perspective No. 09-03.

there have been no substantive proposals to restructure the upstream market (e.g., by re-introducing unbundling) since the early 2000s.

Summary of US experience

In summary: the United States had a long period of “market mitigation”, in which the presumption of a regulated natural monopoly was widely accepted. A combination of competition facilitated by new technology and a major upheaval in economic thinking in the 1970s and 1980s led to the adoption of policies that aimed to encourage entry and competition, including in the local loop. The two signature restructuring interventions of the era—the separation of AT&T and the unbundling mandates that accompanied the 1996 Telecommunications Act—now seem like historical footnotes, and some of their key premises were relatively quickly invalidated by rapid technological progress. This technological progress manifested itself in competition from cable and wireless networks. Given this, the market-shaping regulatory interventions of 1984 and 1996 seem to have been rather wasteful experiments, besides being unsustainable given the technological realities of the industry. In particular, more modest interventions ensuring interconnection between networks at economically efficient rates and allowing entry into all market segments may have been enough to accommodate sustainable technology-based entrants, while traditional regulation such as price caps may have been an alternative to protect consumers in geographies or market segments where competition was still not possible or was insufficient. In this sense, we consider the history of US telecommunications to provide important cautions to regulators and policymakers who wish to “restructure” markets in ways that are not obviously suggested by the underlying economics of the industry.

B. The United Kingdom

The United Kingdom has perhaps the second-longest and thus in theory the second-most-varied telecommunications regulatory history for us to examine. The UK was in the vanguard of privatisation and liberalisation in the 1980s. Key regulatory innovations such as price cap or “RPI-X” regulation were developed in the context of newly privatised British utilities, including British Telecommunications Plc (“BT”) which was privatised in 1984. In fact, the UK began liberalising its industry in the early 1980s, initially with the liberalisation of value-added network services (“VANS”) and then by allowing Mercury Communications Plc to offer switched voice services from 1983 onwards. A period of officially sanctioned duopoly followed, which lasted until 1991 (for local calls) and 1996 (for international calls).

The UK experience might be characterised as having three broad phases:

- Emphasis on facilities-based competition, from the privatisation of BT to roughly the end of the “OfTel” (Office of Telecommunications) era in 2003.
- Emphasis on local loop unbundling and access regulation, from about start of the “Ofcom” (Office of Communications) era to very recently;
- Renewed emphasis on facilities-based competition, this time in very high-speed networks.

In our view, the U.K.’s policies—which were forged in the era of modern theories of regulation and industrial organisation—have always had a much more market-shaping bent than the policies pursued in the U.S. The critical distinction between the OfTel era and the Ofcom era is that the focus of market-shaping efforts has shifted from attempting to ensure or perhaps even engineer the right conditions for facilities-based alternatives to BT (OfTel’s objective) to ensuring a diversity of “downstream” competitors.⁷⁸

⁷⁸ The distinction between “upstream” and “downstream” markets is arguably an artificial one, created by regulatory intervention. The general evidence from the UK and elsewhere is that in the absence of regulatory constraints, firms would seek to exploit economies of scale (gained through horizontal integration), economies

The Oftel Era

The Telecommunications Act of 1984 then privatised BT, the state monopoly, and created Oftel to regulate it. Oftel imposed a universal service obligation as well as retail price controls on BT in the same year. A seven-year official policy of duopoly in the fixed market ensued although a form of indirect access was introduced in 1986.⁷⁹ The duopoly over local and national calls ended in 1991, and in 1996 for international calls.⁸⁰

The first additional Public Telecommunications Operators (PTOs) were licensed in 1993. They provided further facilities competition or services competition via indirect access. Some of the new facilities competitors launched fixed-wireless alternatives to the copper ‘last mile’. Inter-modal competition was also introduced in 1993. Cable companies were permitted to compete against BT and Mercury using their own networks but were limited to their local franchise areas, although this was subsequently relaxed so as to allow national-level competition. Accounting separation was introduced in 1995, as were regulated prices for unbundled standard interconnect services. These were cost-oriented and non-discriminatory as between BT retail and independent retail operators. The mid- to late-1990s also saw extensive new entry into most of Europe, including the UK, fuelled by the ‘dot.com’ boom. In the UK, most of this entry was facilities-based and focused on fibre. Crandall and Waverman (2006) estimate that nine entrants constructed what they define as ‘substantial’ fibre networks, i.e., fibre networks that comprised more than just a fibre ring around London.⁸¹ They focused on business customers and their investments added a significant amount of capacity to the private leased lines market.

Three regulatory issues of this era capture well the emphasis on engineering facilities-based competition:

- The BT/Mercury duopoly was predicated on the notion of giving a single competitor the “space” to develop its own product offerings and network in competition to BT, but without facing additional competition from other would-be entrants. In fact, Oftel did not allow cable operators to offer telephony in direct competition to BT or Mercury for a while, and then limited the scope of such competition to local franchise areas. The overall result of this policy of attempting to develop a strong facilities-based competitor to BT was quite disappointing. During the duopoly period, Mercury focused on lucrative business customers and by 1991 it accounted for just 2% of the local loops in the UK.⁸² The discipline on retail prices during this period was largely the result of retail price controls on BT.⁸³
- Oftel was also reluctant to mandate “equal access” for long-distance carriers. Equal access meant that customers of such long-distance entrants would no longer be required to dial extra digits in order to access their preferred long-distance carrier. Oftel’s reluctance to mandate equal access policies was directly motivated by concerns about providing entrants the right incentives to build their own facilities, which was a critical policy goal of Oftel and the British government.⁸⁴

of scope (gained through integration with providers of complementary services), and economies of vertical integration.

⁷⁹OECD, 2002: 43. ‘Call-by-call’ selection allowed customers to obtain call services from providers other than the access network provider. Those customers would have to dial extra digits in order to access their preferred provider. The implications for competition would be debated in the mid-1990s.

⁸⁰ It ended for local and national calls in 1991. It continued until 1996 for international service.

⁸¹ Crandall and Waverman (2006), *supra.*, pp. 130-132.

⁸² Crandall and Waverman (2006), *supra.*, p. 128.

⁸³ Valletti, Tommaso (1999), “A Model of Competition in Mobile Communications”, *Information Economics and Policy*, Volume 11, Number 1, pp. 61-72.

⁸⁴ Geradin, Damien and Michel Kerf (2003), *Controlling Market Power in Telecommunications: Antitrust vs. Sector-Specific Regulation*, Oxford: Oxford University Press, at p.194.

- In the late 1990s, Oftel’s focus switched to promoting the expansion of the UK’s cable networks as its primary hope for achieving facilities-based competition. BT was expressly prohibited from participating in the then-nascent video market, which gave the UK’s cable networks the exclusive ability to offer voice and TV services as a bundle (prior to the advent of local loop unbundling). Oftel’s hope was that doing so would give the cable operators the ability and incentive to continue expanding networks.

Oftel’s regulatory efforts bore little long-lasting fruit. The dominant position of BT in the UK’s fixed-line sector remained in-tact and was, in fact, the central feature of the UK market that motivated a change in regulatory direction when Ofcom succeeded Oftel. The cable networks entered the UK in an effort to find a niche in the video market. This niche was more limited than in other countries such as the US, because BskyB already had a well-established pay TV distribution network and some important access to content. The policy of promoting cable was not strikingly successful—cable operators were providing over 5m voice lines to residential and business customers by the early 2000s and had begun to offer broadband services. However, the cable networks still reached less than half the country by the mid-2000s and their financial condition was—even after the consolidation of disparate franchises into NTL and Telewest—always a source of concern.⁸⁵ Given the conditions in the UK voice and video market segments, it is unclear whether there really was a profitable niche for cable operators. As it happens, the much lower costs (relative to incumbent telco networks) of upgrading cable networks to offer ultra-high-speed broadband have played an important and lasting role in ensuring competition in the UK broadband market, but only recently with “Project Lightning” has the cable network (now consolidated under “Virgin Media”) made a serious effort to expand its reach.⁸⁶

Oftel’s successor, Ofcom, summarised matters thus in 2004, as it commenced upon an ambitious strategic review of the telecommunications sector:⁸⁷

Despite nearly 20 years of regulatory activity intended to promote competition, the detailed market reviews conducted by Oftel (Office of Telecommunications) last year concluded that BT remains in a position of Significant Market Power (SMP) in many of the fixed telecoms markets examined. This contrasts sharply with the optimistic expectations of governments and regulators, expressed at various stages over the years, that fully effective competition would rapidly be established and regulation could consequently be withdrawn. Nor do international comparisons always suggest that the UK is as far out ahead of the pack as we would wish and expect to be, given that we started the liberalisation process quicker than most of our competitors.

There was, however, one striking success story of entry in the 1990s. This was of mobile/wireless telephony, and it had little to do with ex-ante regulation. That said, by the late 1990s, Oftel was expressing concern about the concentrated nature of the UK mobile market. There were roughly four equally sized operators in the market at the time. The UK 3G spectrum auctions were held in 2000, and resulted in record-breaking revenues. The sums spent on 3G spectrum in the UK and elsewhere in Europe were to constrain the European industry’s profitability and ability to spend on capital projects for years to come and played a role in Europe’s falling behind the United States and Asian nations in deployment of advanced mobile broadband technologies. From our perspective, however, the most important element of the auction was the use of a spectrum set-aside to accommodate the

⁸⁵ See Whalley, Jason and Peter Curwen (2010), “Implementing Functional Separation in Fixed Telecommunications Markets: the UK Experience” in Henten and Glentzoglanis (2010), *op.cit.*

⁸⁶ This initiative aimed to expand the reach of Virgin’s network by four million premises by the middle of 2020, taking the overall footprint to 17m premises. See <https://www.choose.co.uk/news/2018/virgin-media-project-lightning-expansion-continues/>.

⁸⁷ Ofcom (2004), *Strategic Review of Telecommunications: Phase 1 Consultation Document*, p.2.

entry of a fifth mobile operator. In hindsight, there are few countries today that have five successful mobile operators, and not many that have four roughly equally balanced operators as the UK did in 1999. Although mobile/wireless networks are not subject to quite the same economies of scale as fixed networks (marginal costs start rising once capacity is constrained, and capacity constraints are far more likely in mobile than in fixed), they are a natural oligopoly. Recent merger cases have hinged (implicitly) on whether four operators can be sustained or whether three is the “natural” number for most countries. The UK’s efforts to encourage the entry of a fifth mobile operator in the early 2000s seem dramatic in light of current thinking about the mobile industry.

The Ofcom Era

During the Ofcom era, the UK has maintained its reputation as a regulatory innovator. Yet after the passage of more than 15 years since the strategic review that defined Ofcom’s early days, one can make largely the same observation about the UK as Ofcom made about the UK’s standing more than 15 years ago—despite a tradition of regulatory innovation, the UK is not at the forefront of international telecommunications in quite the way that one might expect.⁸⁸ Of course, the causes of this are complex and multi-variate, and encompass far more than just the effect of Ofcom’s regulations. Current trends indicate an imminent future landscape where large firms that are integrated across multiple lines of business (content, mobile, fixed broadband) compete substantially based on the infrastructure that they own. For example, the proposed merger of Liberty Global’s UK assets (which are marketed to consumers using the Virgin Media brand) with O2/Telefonica’s UK arm, the acquisition of EE by BT in 2015, and the emergence of urban fibre networks that could integrate or sign long-term infrastructure leasing contracts with the likes of Vodafone all suggest the potential for substantial infrastructure-based competition in converged (bundles of) services.⁸⁹

If this landscape materialises, it might be seen as the belated recognition of the vision that Oftel set out in the 1990s. However, such competition would be the result of the confluence of various technological innovations that have materialised over the past few decades and have slowly cumulated to the point that they offer a serious prospect of end-to-end infrastructure competition. All the same, such competition is inevitably going to be of the “small numbers” variety, meaning that firms will likely have some degree of market power, absent regulatory intervention. The important questions for regulators are whether imperfect regulation can improve on imperfect competition, and whether regulation should be of the entry-promoting variety that has been emphasised in the UK for decades.

For our purposes, however, the most salient intervention of the Ofcom era is obviously the “functional separation” of BT, which was agreed to following the Telecom Strategic Review of 2004/05. The backdrop to functional separation was the perception that the UK’s cable operators were facing significant financial difficulties and were unlikely to be able to expand their network footprints for years to come. Inter-modal competition between DSL and cable had driven broadband adoption in the UK, but the perception was that the UK was lagging behind other European countries in broadband adoption. It was also felt that in comparison to countries such as France, the uptake of local loop unbundling (LLU) in the UK was poor. Despite very large cuts to the price of unbundled loops in 2004, it was felt that BT had strong incentives to engage in non-price discrimination against would-be LLU entrants. Functional separation offered a way to address widespread concerns about BT’s ability to block LLU entry; and LLU entry seemed to be a promising way of seeding sustainable

⁸⁸ As Ofcom and the UK government themselves have emphasised, the country is significantly behind others in the deployment of FTTH networks, a situation that the government suggests is driven by BT’s reluctance to invest in fibre.

⁸⁹ Over the past 10 years, the UK arms of T-Mobile and Orange merged to form Everything Everywhere (or EE), resulting in a consolidation to four major players, of which the fourth (Hutchison-owned Three) was by far the smallest. Three subsequently attempted to merge with O2, but the European Commission blocked the merger (and a European court very recently overturned the Commission’s decision). BT, meanwhile, acquired EE.

broadband competitors. The example of Iliad/Free, which had made a major impact on the French broadband market, was widely touted in the industry as an example of LLU-based entrants migrating up what had become known as the “ladder of investment.”

Viewed from the perspective of solving industry concerns about BT’s behaviour, and from the perspective of promoting LLU-based competition, separation was something of a success. The number of unbundled lines grew from 123,000 lines in September 2005 to 5.9 million by the end of 2009.⁹⁰ It is also true that residential broadband prices fell, and broadband penetration grew healthily. However, the UK had some of the cheapest broadband in the OECD prior to separation⁹¹, and that broadband penetration had been growing very healthily prior to separation.⁹²

LLU-based entrants also did not migrate up the ladder of investment and invest in their own last-mile facilities, not even on a localised basis.⁹³ Valletti et. al. (2015) suggest that LLU-based entry did have a positive effect on penetration and quality of BT’s own services, the effect on penetration tailed off as the broadband market reached maturity; by contrast, they find that the presence of a cable operator in a local exchange increased both penetration and quality.⁹⁴ The authors find that LLU entrants did invest significantly. Our interpretation of these results is that LLU-based entry may stimulate quality-adjusted output in a market, although we cannot tell whether this increase in quality-adjusted output is enough to counteract the increase in average cost for incumbent facilities-based firms and the increase in total fixed investment, i.e., whether the business-stealing effect dominates any output-expanding effect. The results for cable competition seem to point towards an increase in both output and quality, and hence a larger increase in quality-adjusted output than is the case for LLU, and given the relatively low costs associated with upgrading the cable broadband network in the period that the authors were analysing, cable competition is clearly less likely to be merely “duplicative” than LLU-based competition. LLU-based competition appears to be intermediate in its effects between simply duplicative resale service and true inter-modal competition. However, if it is true that LLU-based operators make significant sunk investments themselves, the question is whether from a social standpoint the benefits of additional differentiation and higher penetration that LLU drives are enough to counteract the increase in industry-wide average costs. As such, while there may indeed have been merit to Ofcom’s policy of backing LLU-based entry, the case for these policies would appear yet stronger if there were systematic evidence of LLU-based entrants investing in their own next-generation access networks.

Instead, in the UK, entrant investment in next-generation access networks appears to be driven by fibre operators such as City Fibre, HyperOptic and Gigaclear, none of whom have migrated upwards from LLU. Broader competition is being driven by the modest rejuvenation of the cable network, which is able to offer speeds of several hundred Mbps at much lower incremental investment than is required for fibre.

Further, more systematic cross-country evidence finds that access regulation—of which separation is a particularly strong form—may not result in any “ladder of investment” effect, and may even

⁹⁰ Curwen and Whalley (2010), *supra.*, p.242.

⁹¹ Hausman and Sidak (2005), *supra.*, pp. 209-210.

⁹² Contemporaneous data provided by the ECTA (European Competitive Telecommunications Association) Scorecard shows that the UK was experiencing more rapid growth in the broadband market than the pre-accession EU 15, and much of this growth was coming from DSL services using BT’s pre-separation wholesale offerings. See Crandall, Robert W., Jeffrey Eisenach and Robert Litan (2010), “Vertical Separation of Telecommunications Networks: Evidence from Five Countries”, *Federal Communications Law Journal*, Volume 62, Issue 3, pp. 493-539, at p. 513 and footnotes 74-75. The authors add that only five countries were measurably ahead of the UK in broadband penetration in September 2005.

⁹³ Curwen and Whalley (2010).

⁹⁴ Valletti, Tomasso, Mattia Nardotto, and Frank Verboven (2015), “Unbundling the Incumbent: Evidence from the UK”, *Journal of the European Economic Association*, Volume 13, pp.330-362.

adversely impact on incentives to invest in next-generation facilities. Examples of such studies include Grajek and Roller (2012), Bourreau et. al. (2014), Dauvin and Gryzbowski (2014), and Briglauer (2015), with Waverman et. al (2007) providing an early example of a Europe-wide study. It is certainly true that Verizon in the US made a much earlier and more substantial FTTH investment than any incumbent in a large West European nation. But it is also true that several West European countries have higher broadband adoption rates than the US, and true delivered broadband speeds appear to be nearly as high in the highly-regulated UK as they are in North America, which has a much higher proportion of cable connections and thus should have substantially higher speeds.⁹⁵ These mixed empirical observations are also reflected in the econometric analysis of Sidak and Vassallo (2015) who find that UK prices are particularly low in comparison to other countries, but that the UK lags on measures of investment and global leadership in telecoms. They express the view that functional separation and the regulatory regime accompanying it have disincentivised BT from investing in next-generation access.

Regardless of the mixed empirical evidence, there is certainly a strong theoretical argument that tight regulation can inhibit investment. A modern synthesis of competing economic theories of the effect of competition on innovation suggests that competition can drive innovation via an “escape effect”, but the existence of this effect depends on the difference between post-innovation and pre-innovation profits.⁹⁶ Unless regulators can credibly commit to withdrawing access regulation—and the attendant cap on investor profits that it entails—it is difficult to see how the wedge between pre-innovation and post-innovation rents would arise for a regulated firm subject to access mandates. Ofcom has made various efforts to fine-tune the system of incentives for BT — for example, allowing BT pricing flexibility with respect to the price of Virtual Unbundled Local Access (VULA), and increasing the wedge between copper and fibre wholesale prices—in order to encourage next-generation investment. These interventions indicate an underlying belief that a great deal of regulatory management is required—to the point where one must genuinely consider whether this type of regulatory management and the political economy it spawns is preferable to the alternative of small numbers competition between end-to-end integrated firms. If the UK industry moves organically to the vision of end-to-end integrated competition we set out above, this may render large parts of the elaborately constructed regulatory system irrelevant—a fate perhaps not dissimilar to that of the elaborately constructed US regulatory system following the AT&T divestiture.

In summary, the 35-odd years since the UK moved from state monopoly to a private-sector-led telecom industry have featured a great deal of regulatory innovation, especially of the market-shaping variety. Our observation, as with the US, is that the results of such market-shaping intervention have been mixed—while there have been some apparent gains (e.g., low prices), there are no examples of the signature regulatory policies of Oftel and later Ofcom having created sustained successful competitors to BT. Especially given the transition costs and regulatory complexities involved with functional separation—and its subsequent enhancement in 2017—the UK offers little compelling evidence that ambitious market-shaping policies do better than would unregulated imperfect competition or (if such competition is not feasible) market-mitigating regulation. As with the US’ earlier experiments in market-shaping regulation, a possibility that must not be ignored is that these ambitious regulatory efforts may even have delayed or dampened the natural evolution of the market.

⁹⁵ Akamai State of the Internet, Q1 2017, Appendix A.

⁹⁶ Aghion, Philippe, Nicholas Bloom, Rachel Griffith, Peter Howitt and Richard Blundell (2005), “Competition and Innovation: An Inverted U Relationship”, *Quarterly Journal of Economics*, Volume 120, Number 2, pp. 701-728.

Section V: Conclusions

A. Introduction

The sheer size, reach and pervasiveness of a small number of digital platforms has sparked an intense global debate about the “power” of these platforms. This “power” extends far beyond traditional notions of market power that are debated and discussed by economists, and extends into areas such as “fake news” and political representativeness, censorship, national security and child protection. Of course, besides these concerns there is also a traditional market power concern—that platforms are prone to “tipping”, that indirect network effects and economies of scale can entrench dominance, and that the creation of vast ecosystems of complementary products provides an opportunity for platforms to entrench their dominance. These concerns, as well as concerns about privacy, data use, censorship, and the like are translating into regulatory enforcement and rulemaking. For example, the UK competition authority is looking at digital platforms and the advertising market, while the EC has launched a string of high-profile antitrust actions against Google and is currently consulting on a new competition tool focused squarely on digital platforms. Regulatory thinking is moving towards a set of special measures that include specific regulatory institutions, changes to merger control procedures, data portability and interoperability requirements, among other things. It is thus an opportune moment to consider the debate on platforms in a broader context, and to attempt to distil lessons from other economic environments in which regulators and competition policy-makers have been confronted with similar issues.

In particular, the fundamental issue facing competition policy-makers and regulators is that industry structure and production technologies are inherently linked. As discussed in Section 3, antitrust concerns in the US economy came to the fore when large capital-intensive production technologies began to replace the artisanal production methods of the 19th century. These production technologies conferred advantages to large firms. Not only were telecommunications networks characterised by scale economies, but they were also characterised by (direct) network externalities. Again, the efficient provision of such services conferred advantages of size—whatever one makes of the mixed evidence of whether there was a normative natural monopoly in the provision of telecommunications service. Over the last century, there have been several debates about what the right approach to the challenges created by economies of scale (and also economies of scope and economies of vertical integration) should be—whether one can use skilful regulation to isolate “competitive bottlenecks” and thus engineer competition in certain vertical layers or market segments; whether full facilities-based competition is possible; or whether the best policy is to rely on technological progress that enables the replacement of incumbent firms, and where that is not possible to protect consumers by market-mitigating regulation.

Further, the idea that there may be trade-offs between competitive entry and other dimensions of static and dynamic economic efficiency has also been tackled in policy debates in the area of innovation, and in the economic literature on the efficiency of free entry and product differentiation.

B. Lessons from Telecommunications Regulation?

As such, the challenges and trade-offs facing policy-making in digital platforms is not entirely novel, at least not when one frames these challenges and trade-offs in a broader context. Weyl and White explicitly make the analogy between natural monopoly and platform settings, which we think is justified. They also reinvigorate an idea that originated in an earlier literature on direct network externalities, notably the idea that adaptive pricing—low when network effects (and hence quality of service) are low, and high when network effects (and hence quality of service) are high—can guide the market towards optimal adoption. They argue that the pessimistic view in competition policy that consumers cannot coordinate their migration to a new better technology or service is overdone, and that the actual pricing strategies of successful platforms provide evidence that entrants can use

relatively simple insulating strategies (similar to the adaptive pricing described previously) to coordinate the process of consumer migration. They do think, however, that in many ways platform pricing will create distortions—specifically, the Spence distortion discussed above—but that competition is not the solution to these distortions and that competition may even inhibit the all-important delivery of network effects by large-scale platforms. In effect, this is a view that competition for the market is feasible—because entrants with enough access to financing and who can appropriate a high enough share of social surplus from the products they create can use insulating strategies to win market share; but that where competition cannot work or perhaps should not work, regulation of the market-mitigating variety is required.

Similar debates have played out in the telecommunications regulatory arena for a century or more. Broadly, we observe two primary types of intervention: market-mitigating regulation that accepts the industry structure for what it is, and attempts to (via regulation) capture as much of the benefits of size for consumers; and market-shaping interventions that have attempted to engineer entry via appropriate regulation. We also observe that incumbent fixed-line networks are facing increased competition to provide integrated services from alternative technologies, to date especially cable operators and mobile operators. Thus, the question about whether dynamic technologically-driven competition will materialise to a sufficient extent that it will erode dominant incumbent positions—or whether the mere threat of such technologically-driven entry will discipline dominance—has also arisen in the telecommunications industry.

Our study of the US and UK suggests that it is difficult to manage competition and competitive entry. In the US, antitrust policy and regulation attempted to separate the hitherto-integrated activities of providing long-distance and local services in the belief that they were isolating a bottleneck. Later, regulators emphasised a distinction between upstream or “wholesale” markets and downstream services markets, in the belief that the “upstream market” was the potentially isolatable bottleneck. They also emphasised the possibility that competition in the services market could serve as a stepping stone to competition in the upstream market or access layer. Both these American policies now seem to be quaint historical footnotes. The very idea of “long-distance” versus “local” service now seems decidedly anachronistic, and today few would question the idea that these services should be offered by integrated firms. In fact, competition from mobile operators—technology-based entry—was one of the key reasons for why this distinction between local and long-distance service disappeared. The ambitious effort to separate AT&T appears, in hindsight, to have been surpassed by the changing technology all around it.

Likewise, there is no evidence that the “stepping stone” theory of access regulation bore any fruit. US regulators chose to—albeit with considerable and continuing controversy—rollback access regulation and rely on intermodal competition between cable and incumbent networks (and subsequently also mobile networks). As we discuss, this approach may have had positive results in encouraging investment by incumbent telephone companies in broadband networks, but it has also engendered controversy about the US’ performance in broadband performance. “Small numbers” facilities-based competition between differentiated technologies might fit with the natural structure and economics of the industry, but may not be unproblematic. Whether any distortions—e.g., as the result of the market power of firms—are best dealt with by consumer-protecting regulation or by attempting to engineer a more “competitive” market structure is open for debate. In the context of platforms, Weyl and White suggest that distortions—in their case, Spence distortions—are best addressed via regulation rather than entry-promoting competition policy. We believe that the US experience with market-shaping policies lends some support to this view, i.e., that regulatory management of market structure is unlikely to be successful.

The UK has, since the advent of liberalisation in 1984, also made ambitious efforts to use regulation to introduce more competition into the telecommunications industry. Oftel was notably keen on

promoting facilities-based competition. In order to give Mercury commercial space to compete with BT, it initially stipulated a duopoly market structure. In the early 1990s, it also promoted a similar structure in the nascent mobile communications structure, for similar reasons. However, by 1999, it had reversed course and was expressing concern with a market structure featuring four roughly equally sized mobile operators—the subsequent effort to promote a fifth operator via a spectrum set-aside was also not successful. Likewise, restrictions placed on BT’s ability to compete in video markets did not provide the cable industry with quite the boost that Oftel hoped it would provide. That said, the initial spurt of investment in the UK cable market (encouraged mainly by foreign investors) has had relatively happy, if quite accidental, consequences for competition in broadband today. The main success story of the Oftel era was the emergence of mobile networks, but this emergence—which was paralleled through the world, regardless of the regulatory regime in place—was driven by the new GSM technology, truly mobile handsets, and clever marketing and pricing strategies.

Ofcom, the successor regulator to Oftel, began its life with a strategic review of telecommunications that noted that despite twenty years of promoting competition and despite being a leader in market liberalisation, the UK was not as far in the vanguard of telecommunications markets as it would have hoped to be. After more than fifteen additional years of regulatory experimentation—in particular, Ofcom’s very strong commitment to local loop unbundling in the 2000s, supported by its signature policy of functional separation—almost exactly the same observation can be made about the UK telecommunications sector today as Ofcom made in 2004. There is no evidence that local loop unbundling worked as a “stepping stone” to facilities-based competition, and there is some evidence (even if clean inferences are notoriously difficult to make from the complicated fact pattern at work here) that access regulation has hindered innovation by BT in providing new access technologies. Instead, despite a much more vigorous policy of access regulation than was followed in the US, the UK may also see its market consolidate into a small number of vertically integrated, facilities-based competitors, able to offer TV, broadband and mobile services using differentiated production technologies. A new wave of fibre entrants—who can potentially vertically integrate with or sign long-term contracts with downstream firms that can offer content or mobile services—also seems unrelated to Ofcom’s regulatory policies, except to the extent that BT’s alleged reluctance to invest in fibre is linked to regulatory-influenced incentives.

The overall lessons from the UK and US episodes of regulatory intervention suggest that the natural economics of scale, scope, integration and network externalities are very difficult to reshape via regulation (or antitrust intervention). Regulators and competition authorities may be better off attempting to protect consumers from platforms’ exercise of market power or their potential to create Spence distortions. Competition policy to control collusion or abuses of dominance that leverages market power from a primary platform market into an adjacent market may also be warranted. But efforts to create competition between platforms may be ineffective and even counterproductive. It may also be worth considering whether certain aspects of platforms are so unique that they require a specific competition or regulatory approach. For example, the problems related to competing against an ecosystem would apply in other industries too. The manufacturing capabilities of producers of spare parts for machinery can become locked into the requirements of a dominant producer of that machinery, i.e., in effect the dominant firm creates an ecosystem and entrants would find that suppliers of complementary products are locked into that dominant firm’s ecosystem. The difficulties of competing against an ecosystem might not be novel to platforms. Such difficulties might even arise in much humbler contexts, such as razor blades, or coffee machine capsules, or printer ink.

C. Concluding Thoughts and Next Steps

Our conclusions are modest and tentative ones. It is obviously not straightforward to construct the analogy that we have constructed in this paper, and there are important points of detail that limit the generalisability of our results. Further, our ability to generalise would be much improved by looking at the experience of telecommunications regulation in the wider European Union, and in Korea and Japan. We plan to add this research in subsequent drafts of the paper.

We also note that there are other promising arenas from which potential policy lessons for platforms can be derived. One of these arenas is intellectual property and the broader economics of innovation developed around it. In this arena, we see that institutions such as standard-setting organisations have created policies to manage the trade-offs between the benefits of standardisation (and the market power it can create both upstream and downstream, via vertical integration) and the need to ensure sufficient diffusion and downstream competition in products that incorporate the standardised technology. Standardised air interface technologies for mobile telecommunications are the most prominent example. Despite the litigiousness seen in this arena, there has been no shortage of innovative handset products and continued rapid improvement in upstream air interface technologies. Perhaps a reasonable case can be made that the relatively non-prescriptive institutional arrangements (commitments to licence on reasonable and non-discriminatory terms, without prescribing a specific formula for what exactly this means) in this arena have reasonably captured the benefits of standardisation, but protected consumers and the process of product diffusion. If so, then this would provide another example of market-mitigating institutional arrangements that nonetheless preserve the benefits of a consolidated standard or platform.