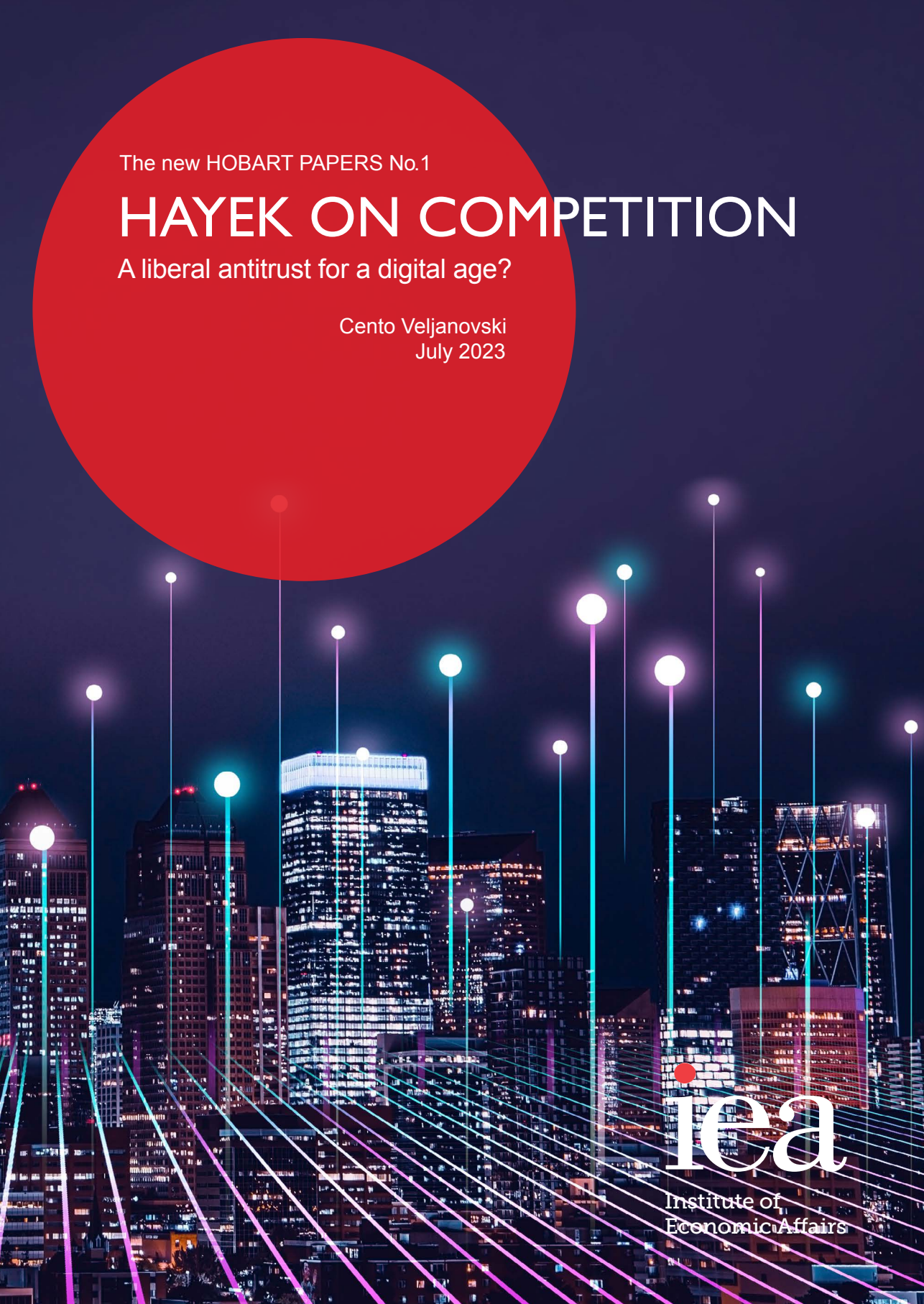
The new HOBART PAPERS No.1

HAYEK ON COMPETITION

A liberal antitrust for a digital age?

Cento Veljanovski
July 2023



iea
Institute of Economic Affairs

About IEA publications

The IEA publishes scores of papers, books, blogs and more each and every year – covering a variety of stimulating and varied topics.

To that end, our publications will, in the main, be categorised under the following headings, from May 2023 onwards.

Hobart Editions

Papers or books likely to make a lasting contribution to free market debate, either on policy matters or on more academic grounds

IEA Foundations

Primers or introductions to free market concepts, ideas and thinkers

IEA Perspectives

Majoring on current policy-focused issues

IEA Briefings

Short, punchy reports on contemporary issues

IEA Special Editions

Spotlighting lecture transcripts, celebrated writers and more

Much of our work is freely available on the IEA website. To access this vast resource, just scan the QR code below – it will take you directly to the IEA's Research home page.

Contents

About the author

Cento Veljanovski is the Managing Partner and founder of Case Associates, and IEA Fellow in Law and Economics. He has over 40 years' experience as an adviser to companies on competition and regulatory economics, has been a director of several management and economics consulting firms, on the board of listed public companies, and is a past editorial and research director at the Institute of Economic Affairs.

Cento has had a distinguished academic career. He was educated in Australia and the United Kingdom, holding several degrees in law and economics and was a 'Commonwealth Scholar.' Cento has held academic posts at universities and research centres in the UK, North America, and Australia including full-time appointments at Oxford University, University College London, Monash University and as Visiting Professor at the University of Toronto. Publications include *Selling the State – Privatisation in Britain* (1987) *Economic Principles of Law* (2008), *The Economics of Law* (2008) and *Cartel Damages* (2020).

Summary

- Competition is a discovery process between rival firms and can only be explained if the information is imperfect.
- Competition is the most effective way to coordinate economic activity by disseminating the information and knowledge held by market participants in a world of generalised ignorance and change.
- The free market and evolved customary laws operating within the rule of law create a spontaneous order necessary for and subject to individual liberty.
- Hayek was not an advocate of laissez-faire or the unbridled freedom of contract. He saw the necessity for state intervention to foster competition, provide services, and ensure individual liberty.
- Competition does not mean a market will have many firms. Monopoly and oligopoly may be more efficient, provide cheaper goods, and greater innovation, and will generally be under constant challenge.
- Key to Hayek's notion of competition and competition policy is contestability or potential competition.
- An active pro-competition policy is consistent with liberalism which removes government barriers to entry, reduces the legal protection given to intellectual property (patents, copyright, trademarks) and corporations, and a supportive tax and monetary system.
- The 'big is bad' mantra now influencing competition policy was rejected by Hayek as producing 'essentially antiliberal conclusions drawn from liberal premises.'

- Hayek proposed a modest competition law that would prohibit exclusionary price discrimination by monopolies and render contracts in restraint of trade unenforceable. These prohibitions would be privately enforced by giving those harmed the right to sue for ‘multiple damages’ supported by lawyers who are paid contingency fees.
- Hayek’s focus on information and knowledge processing should make his approach relevant and adaptable to the trends now experienced in the digital sector.

Introduction

Here I revisit Friedrich Hayek's (1899–1992) approach to competition and antitrust, and their relevance to the digital economy. I ask the questions of whether algorithms, big data, and online digital platforms supersede or alter Hayek's faith in competition as the most efficient information discovery process and whether his views on competition policy and antitrust provide guidance to the present efforts to reign in 'Big Tech.'

Hayek was a classical liberal and a controversial thinker in and outside liberal circles. His liberalism is based on promoting economic liberty within a legal framework which facilitates free competition and limits the coercive powers of the state. Hayek's liberalism stands out from other liberal theories because of its evolutionary focus and the positive role he gave to the government to set the legal rules for, and where necessary supplant and complement, the market. He was not an adherent of laissez-faire, free enterprise, conservatism nor a 'neoliberal' (whatever this last term means). Hayek offered a multi-layered theory that deals with a world that is complex, changing, and unpredictable.

Hayek wrote his foundational works during and after WWII when Europe emerged from the yoke of National Socialism to confront the rise of socialism and its communist realities with their destructive and anti-liberal propensities. Even ignoring these geopolitical factors, Hayek wrote during a mechanical and analogue age dominated by manufacturing industries. He could not have imagined, let alone predicted the developments in digital technology and computing power that are transforming the economy and society.

Hayek regarded free competition as the best method of discovering and disseminating the information needed to coordinate markets and the economy. The potential challenge to Hayek's theory is evident. With the massive increase in computing power and the accumulation and processing

of massive amounts of data at high speeds using sophisticated algorithms, the costs of acquiring, processing, and using information have declined massively. Since Hayek's case for the superiority of the competitive price system was based in part on the claim that it does these tasks more efficiently, it follows that any technological advance that lowers the costs of undertaking the same tasks will in some way replace or at least augment the functions of the price system. Some think the time has come. Glen Weyl, an economist at Microsoft offers such a view:

> Yet, increasingly, information technology is leading individuals to delegate their most 'private' decisions to automated processing systems. Choices of movies, one of the last realms of taste one would have guessed could be delegated to centralized expertise, are increasingly shaped by services like Netflix's recommender system. While these information systems are mostly nongovernmental, they are sufficiently centralized that it is increasingly hard to see how dispersed information poses the challenge it once did to centralized planning.
>
> Information technology thus fundamentally challenges the standard foundations of the market economy. For many years to come, economists will increasingly have to struggle with this challenge. Some will harness the power of the data and computational power provided by information technology to provide increasingly precise and accurate prescriptions for economic planning. Others, who value the libertarian tradition that has often been associated with economics, will be forced to articulate other arguments, perhaps based on privacy, that are not susceptible to erosion by the increasing power of centralized computation.[1]

Others profoundly disagree. The case for free competition is not simply the technical constraints posed by algorithms and computing power but is inherent in the decentralised and localised nature of knowledge and information in an increasingly complex digital economy.

1 Weyl, G. (2012) Empirics and psychology: Eight of the world's top young economists discuss where their field is going. *Big Think,* July 25 (https://bigthink.com/articles/empirics-and-psychology-eight-of-the-worlds-top-young-economists-discuss-where-their-field-is-going).

Competition law and policy are also undergoing revision and change, in large part because of the growth of large online platforms such as Meta, Amazon, Google and others. Their size, influence, and actions are treated as a threat to competition in some quarters. This has led to debates about the purpose, structure and enforcement of antitrust laws which are seen as antiquated, price centric, and failing to appreciate the complex nature of the so-called digital economy.

Here Hayek's views on competition, monopoly and antitrust measures are explained and challenged, and their relevance to the 'digital economy' is critically assessed. The discussion begins with an exposition of Hayek's meaning of competition together with an assessment of the emphasis he placed on the informational efficiency of prices, dynamic competition, and innovation. Hayek saw markets, the economy, and society in their institutional and historical context. Part and parcel of this was law, which he defined as customary laws in contrast to designed legislation, that had evolved through the interaction of economic forces and individual actions, which he believed better facilitated free competition, liberalism and economic growth. The market was not seen in isolation. Hayek's theory of law and legislation and the interaction between the two are then explained, together with an assessment of why the English common law failed to protect competition as one liberal concept – the freedom to contract – battled in the courts with another – the freedom to trade. Next, Hayek's discussion of monopoly and anticompetitive behaviour is explained and critically assessed, followed by some tentative steps to develop a 'Hayekian' competition policy for the digital sector. Throughout the discussion, the US term 'antitrust,' which arose from the trust-busting origins of the US Sherman Act of 1890, is used for a convenient shorthand for competition law and the two terms are interchangeable.

Hayek on competition

Hayek's meaning of competition was developed in three articles written at the end of World War II (1945a, 1948): 'The use of knowledge in society 'and 'The meaning of competition' and his later article 'Competition as a discovery procedure' (Hayek 1968). These represent a minuscule proportion of Hayek's voluminous writings which after the 1950s focused mainly on political theory and jurisprudence.

Hayek's (1948) essay 'The meaning of competition' was a response to the neoclassical economists' model of perfect competition with its 'unrealistic' assumptions of perfect information, rational behaviour, instantaneous adjustment and equilibrium. As Hayek (1948: 96) put it: '"perfect" competition means … the absence of all competitive activities' noting that 'competition is a sensible procedure to employ only if we don't know beforehand who will do best' (Hayek 1979: 67).

Hayek (1948) made the obvious point that competition is a contest and therefore means rivalry. He then made the less obvious but more important point that competition was an efficient method of dealing with imperfect information and decentralised knowledge. Competition among millions of individuals, firms, merchants, and consumers generated prices that encoded the available information about the value of resources and market circumstances which enable individuals and firms to make informed decisions. As Hayek (1945a: 527) aptly put it, prices are a 'system of telecommunications' of the market.

The meaning of competition

The key features of Hayek's view of competition can be set out in more detail.

Competition is at heart an information production, discovery and transmission system. The assumption of perfect competition – that everyone knows everything – is patently unrealistic. As Hayek (1979: 68) said '[C]ompetition must be seen as a process in which people acquire and communicate knowledge.' More specifically, Hayek (1948: 106) argued that:

> Competition is a process of the formation of opinion: by spreading information, it creates that unity and coherence of the economic system which we presuppose when we think of it as one market. It creates the views people have about what is best and cheapest, and it is because of it that people know at least as much about 16 possibilities and opportunities as they in fact do. It is thus a process which involves a continuous change in the data and whose significance must therefore be completely missed by any theory which treats these data as constant.

For Hayek individuals and firms in the market are largely ignorant of the circumstances surrounding the supply and demand of the goods and services they buy and sell, and the forces responsible for changing prices. Prices convey the necessary information about the demand and supply conditions in the economy on which consumers, producers, distributors, managers and other decision-makers can rely to plan their actions.

For Hayek prices are informationally efficient in the comparative sense as the best available means for economising on and disseminating the dispersed knowledge and information on local conditions known only by those in the market (Bowles et al 2017). Individuals pursue their interests given the information conveyed by prices and the knowledge they acquire. Here Hayek made an important distinction between information, statistical data, and knowledge. Knowledge is the localised understanding of circumstances by individuals. This cannot be captured in statistical aggregates or 'data.'

Competition is a dynamic process, not a 'perfect' outcome. There are no steady-state set of prices, production levels, investment, and/or institutions in the real world that is continuously changing. For Hayek (1984: 325) '[A]ll *economic* problems are caused by *unforeseen* events.' The competitive

market is constantly in flux and adapting to changing technological, economic and a myriad other factors. The focus on the short run is grossly misleading as it fails to incorporate unpredictable effects that arise from developments in a changing market and technological progress. Thus, pricing policies and market structures that look anti-competitive can nonetheless be essential for the dynamic of the market economy.

Entrepreneurs play a key role in a market economy which by its nature is in serial disequilibrium (Kirzner 1997, Thomsen 1992, Littlechild 1986). Entrepreneurs search out present and future profitable opportunities whether they arise from present supply shortages, arbitrage opportunities, and the search and development of new products and more efficient production. In this way they generate an adjustment to prices which others can rely on as signals to guide their purchase, production and investment decisions.

Hayek (1945a: 526) saw free competition as generating a spontaneous order: 'The whole acts as one market, not because any of its members survey the whole field, but because their limited individual fields of vision sufficiently overlap so that through many intermediaries the relevant information is communicated to all.' Instead of decentralised decisions causing chaos, free competition generates a 'spontaneous order' in which the expectations of buyers and sellers are rendered mutually compatible, and which adapts quickly to the continuous changes in circumstances and new information. Prices mediate individuals' expectations by encoding relevant information on which they can act. There is no deterministic equilibrium but an economic process constantly adapting to change and where prices adjust to costs. The competitive process is seen as taking time to react to changing factors so that it may never reach a stable outcome, especially during periods of rapid technological change and economic growth. The idea that free competition gives rise to a spontaneous order is a distinguishing feature of Hayek's concept of competition and liberalism. It is in the tradition of Adam Smith's (1776) metaphorical 'invisible hand'. Subsequent empirical work provides support for Hayek's view of the market process under limited information (Smith 1982; Al-Ubaydli et al 2022).

Hayek was aware that markets were imperfect. As Hayek (1984: 329) said: 'The analysis is not substantially modified by the undeniable truth that even the most perfect market prices do not take into account all the circumstances we would wish – often described as "external" conditions.' His response was that the market handled these situations better than

other ways of organising economic activity when augmented by sensible government interventions. As Hayek (1984 [1991]: 329) said '[T]ravellers do not throw away a map of a strange country because they find it is not wholly accurate'.

Hayek did not treat the pricing system in isolation and separate from the legal, institutional and moral features of society. Prices were not the sole means of imparting information and incentives. Laws, morals, language and personal relationships served a similar function to support the competitive process and liberty. He saw the organisation of production – the firm, corporate structures, vertical integration, contracts, etc – and laws as determined by technological and economic forces that worked together to create both spontaneous market and legal orders (discussed further below)

Finally, of paramount importance to Hayek's conception of competition was that it promoted individual freedom and a liberal society. As Hayek (1945b: 45–6) states:

> Liberalism … regards competition as superior not only because in most circumstances it is the most efficient method known but because it is the only method which does not require the coercive or arbitrary intervention of authority. It dispenses with the need for 'conscious social control' and gives individuals a chance to decide whether the prospects of a particular occupation are sufficient to compensate for the disadvantages connected with it.

Complexity economics

Hayek's (1967) attack on perfect competition was more than the commonplace criticisms of the assumptions of rationality, perfect information and static equilibrium. It was at heart a different vision of economics and its theorising. Hayek eschewed the simplification, mathematisation, and deterministic predictions of mainstream 'neoclassical' economics. Its largely mathematical models, which have grown in greater prominence since Hayek wrote, had stripped economics of its historical, political, institutional, and psychological context and relevance. As W. B. Arthur (2021: 137) puts it: 'By definition, equilibrium makes no allowance for the creation of new products or new arrangements, for the formation of new institutions, for exploring new strategies, for events triggering novel events, indeed for history itself.' In Hayek's (1974) Nobel Memorial lecture, aptly

entitled ‘The Pretence of Knowledge’, he writes, ‘the social sciences, like much of biology but unlike most fields of the physical sciences, have to deal with structures of essential complexity, i.e., with structures whose characteristic properties can be exhibited only by models made up of relatively large numbers of variables’. In short, Hayek embraced the complexity of the economy and society to develop a broad political economy and legal theory of the development of markets and their institutions. Hayek (1967) would have much in common with today’s developing field of ‘complexity economics’ (see Arthur 2021).

Big data and digital socialism

Hayek’s view on competition was fashioned in the 1930s debate over the feasibility of ‘efficient’ central planning where he joined Mises (1934) to challenge the views of Abba Lerner (1934), Oscar Lange and Fred Taylor (1938) (also Dickenson 1933, Taylor 1929) who saw a centrally planned economy, and then market socialism, as viable and efficient alternatives. These economists argued that a central planner could gather data supplied by state-run enterprises to replicate efficient market prices. Hayek showed convincingly that collecting market data by fiat would not be feasible, as much consisted of localised knowledge only known to individual participants in the market. A decentralised market was simply more efficient in producing and processing information and knowledge than a central planning organisation.

Since the 1930s debate over the possibility of ‘socialist calculation’, the world has radically changed. The communications and information systems of the developed economies have advanced beyond even the most optimistic visions of even a decade ago. The development of data processing, computing power, and the penetration of computers, smartphones, the internet, and online services have been phenomenal. These have reduced the processing costs and accessibility of information. Algorithms and artificial intelligence (AI) hold out the prospect of coordination without the decentralised formation of market prices. Immense amounts of personal and other data are collected and used by online platforms with prices often playing no direct role. These developments, known as ‘big data,’ raise the spectre of digital ‘markets’ driven by machine-based pricing software with some legal scholars excitedly predicting ‘the end of competition as we know it’ (Ezrachi and Stucke 2016: 233). There are strong reasons to be sceptical of these exaggerated claims (Veljanovski, 2022c, d). It is doubtful that algorithmic

pricing alone would have caused Hayek to modify his views or call for antitrust intervention.

Not surprisingly, some have begun to resuscitate the case for a planned economy or at least some form of 'digital socialism,' e.g., Wang and Li (2020) and Plaka (2020). As Oscar Lange (1967), a principal protagonist in the 1930s debate, claimed nearly three decades later (and a half-century ago): 'Let us put the simultaneous equations on an electronic computer and we shall obtain the solution in less than a second. The market process… appears old-fashioned.'

Hayek (1982 [1984]: 59) indeed saw the problem confronting the central planner as in part one of the limitations of computing power. He did suggest that the number of equations, parameters and algorithms needed to coordinate an economy without markets would defy the (then) processing capacity of computers: '[E]ven today [in 1982] the solution of 100,000 equations is still an unachieved ambition of the constructors of computers' stating that the only way to solve these equations is to '*observe the practical solution given by the market*' and that 'the real problem is the impossibility of concentrating all the information required in the hands of a single agency.'

This remains so, as seen from the general inability of the most sophisticated macroeconomic models to come close to forecasting economic growth, production and inflation for the next year let alone in real-time or in the future. But even if computers had the technical capacity to model and process the actions of millions of individuals, firms and intermediaries in real-time this would not solve the 'knowledge problem.' Hayek's core thesis was not about computing power but rather the inaccessibility of knowledge which is decentralised, fragmented, ever-changing and only revealed when acted upon by individuals who possess that knowledge (Lavoie 1985 [2015]). As one commentator put it:

> *Information* is not *knowledge*. Take away the market that produces economic data, and governments would be flying blind. What to produce? How much should be produced? What production processes should be used? Who should be employed in production? Eliminate the freedom of individuals to choose, and central planners would have no way to answer these questions despite possessing mountains of past information on their hard drives.

> Such knowledge simply can't be generated otherwise than by the market process. All the data in the world can't change that.[2]

Firms and prices

Hayek's case for free competition was often explained in contrast to central planning, and hence to present it as an uncompromising choice between the two polar economic systems. In later life, he offered a more nuanced analysis which better drew out his central claim that markets and institutions evolve to economise on information costs and foster economic growth.

It follows from Hayek's focus on the information processing costs, that any technological innovation that changes the costs and benefits of assembling, processing and disseminating data will influence the way production is organised. They will affect the boundary between the market and non-market, and the laws and institutions that arise spontaneously to support or supplant the market

This was the Nobel winning insight made by Ronald Coase (1937, 1992) which receives no recognition from Hayek. Coase (1937: 388) asked the question – If markets are costless why do firms exist? Hayek's answer was that they evolved driven by economies of scale and other factors. Coase's answer was more direct – the costs of using the pricing system which he labelled transactions costs. According to Coase, and the New Institutionalists who followed him such as Oliver Williamson (1985), firms and non-market institutions were spontaneous devices that economised on the costs of using the price system (Veljanovski 2015, Munger 2021). To quote Coase (1937: 389): 'the distinguishing mark of the firm is the suppression of the price system' and its replacement by internal commands and governance. The firm and the institutions that arise are governed by authority rather than prices.

Hayek's focus on the role of prices in markets, while an original contribution to economics when made, placed an unnecessary limitation on the meaning of competition. He seemed resistant to explicitly incorporating, say, Coase's analysis, which was fully consistent with his central proposition that information was costly, and that in liberal society laws and organisations

2 Kelly, M. and Lew, P. (2018) Why big data won't save central planners from the knowledge problem – Consumer data have to come from somewhere, and that somewhere is markets. Free Enterprise Education FEE Blog, April 11. (https://fee.org/articles/why-big-data-won-t-save-central-planners-from-the-knowledge-problem).

would evolve from as part of the competition process. Despite this, there is no inconsistency between the view that the institutions can replace and supplant the price system and free competition.

Markets without prices

The collection and processing of individual data and information play a more prominent and different role in the digital economy. Personal data rather than prices mediate many transactions, and it is treated as a commodity rather than a basis for forming prices.

This is specifically the case for search and social networking platforms such as Google and Meta (previously Facebook). Their core services are given 'free' of a monetary price in exchange for the personal data of their users. These platforms then 'monetise' this data by giving access to those advertising their goods and services, and to advertisers.

At the heart of this practice is what economists call multisided markets or platforms (Evans and Schmalensee 2016, Rochet and Tirole 2003). These facilitate interactions between two or more distinct but interdependent sets of users via the Internet. From this perspective, Hayek dealt with one-sided markets where buyers and sellers transact over a single product at observed prices.

A good example of a two-sided market is credit cards. The value of a credit card depends on its widespread acceptance among merchants and users. Merchants will only accept credit cards if there are many users, and consumers will only use credit cards if they are widely accepted by merchants. The credit card company brings together those banks and financial institutions that issue credit cards with those banks which act as acquirers who sign up merchants to foster a viable network. This involves at least four types of parties (card users, merchants, acquirers, and issuers) and others are also involved such as card processing firms.

This in turn has implications for the way platforms 'price' their services. In platform markets, prices serve a *balancing function* rather than reflecting the costs of supplying one or the other side of the platform. One side of the platform receives the service at a 'subsidised' rate or for no payment, while the other side pays more than the marginal costs of supplying the services it receives. That is one side of the market (the merchants) is the 'money side,' and the other (the card users) is the 'subsidy side.' In more

technical parlance, the costs of card usage are placed on the side with the more inelastic demand.

This explains why Google, Meta and other search and social media platforms do not charge their users. The *quid pro quo* is that Google harvests the personal data of its users and monetizes this by giving access to its users' data to advertisers. Over 80 per cent of Google's revenues come from advertising and about half for Meta. Some have described these as 'attention markets' where competition takes place over non-price attributes to attract and maintain users' attention to their platforms and away from other platforms.

This business model is neither novel nor untoward. While not in line with Hayek's focus on prices, it is nonetheless compatible with his broader view of the creativity and adaptability of markets. The advertiser-supported business model deals with the challenges facing the development of online platforms known metaphorically as the 'chicken-and-egg problem,' i.e., how to gain sufficient users to attract advertisers to invest in the service. The 'model' has been used successfully used ever since the development of print (free sheets) and electronic (free-to-air or advertiser-supported television) media. Having said this, such a market poses challenges which are discussed further below.

The innovation machine

Hayek's focus on prices made him downplay innovation and technological progress. These were treated as the consequence and hence backdrop to the superiority of the pricing system. Here the work of fellow Austrian economist Joseph Schumpeter (1883–1950) looms large. Schumpeter (1942) also railed against perfect competition but for another reason – it failed to pay proper regard to innovation. 'Perfect competition has at no time been a reality,' said Schumpeter, '[T]he fundamental impulse that keeps capitalism in motion is an innovation from new forms of capitalist firms.' To Schumpeter, the case for capitalism was not the superiority of the pricing system which he derided, but the way capitalism reinvented itself through 'the gales of creative destruction.' As Schumpeter (1942: 84) put it:

> In capitalist reality, as distinguished from its textbook picture, it is not that kind of competition that counts but the competition from the new commodity, the new technology, the new source of supply,

> the new type of organization (the largest-scale unit of control for instance) – competition which commands a decisive cost or quality advantage and which strikes not at the margins of the profits and the outputs of the existing firms but at their foundations and their very lives.

It is striking that Hayek hardly refers to Schumpeter's work (and then only to criticise him), suggesting some intellectual animosity between the two.

Schumpeter was more sympathetic to monopoly and 'oligopolistic competition,' but it is not correct to say that he supported monopoly. He saw the prospect of a long-lived monopoly as 'rarer than cases of perfect competition' (Schumpeter 1942: 99). His focus was on innovation which could arise from enterprises of all sizes but as he emphasised, innovators were invariably large corporations, not individuals. Modern industries were characterised by large corporations which had the resources and economic power to manage innovation. By innovation they could acquire a short-term monopoly position that would enable them to make profits until their advantage was eroded by imitators and better products. But as Schumpeter (1942: 102) said, '[A] monopoly position, in general, is no cushion to sleep on. As it can be gained, so it can be retained by alertness and energy.' His message was that innovation was the core of the capitalist development and the perfect competition model was irrelevant to determining the efficiency of the market. Indeed, his central point was that competition whether perfect or imperfect was not the appropriate counterfactual because a competitive industry often could not produce as efficiently and generate similar innovation in the long run.

Summary

Hayek's meaning of competition is a dynamic view of competition that takes rivalry between firms seriously. He scotched the claim that competition relies on the assumptions of perfect information and foresight and that its absence was 'evidence' of market failure. Hayek's focus on competition and prices in the production and transmission of knowledge and information and his stress on the complexity of economic and social systems should make his approach relevant and adaptable to the trends now being experienced in the digital sector. Where Hayek was less convincing was his focus on prices as the lodestone of competition. While not ignoring innovation, he downplayed its significance to establish that competition was not chaotic but worked towards a spontaneous order that maximised individual freedom and

economic growth. Innovation is disruptive, not orderly. The rise of big data also challenges his focus on prices where non-price competition and the direct processing of data play much greater roles.

Liberal law

In the *Constitution of Liberty* Hayek (1960: 34–6) said 'A functioning market presupposes certain activities on the part of the state'. At times he contends that the state should 'confine itself to actions that assist the spontaneous forces of the economy.' But generally, Hayek sets out a significant role for government. In *The Road to Serfdom* Hayek (1945: 45/46) cautions against a 'dogmatic laissez-faire attitude. The successful use of competition does not preclude some types of government interference. For instance, to limit working hours, to require certain sanitary arrangements, to provide an extensive system of social services is fully compatible with the preservation of competition.'

Nonetheless, Hayek's liberal theory revolves around the idea of the spontaneous market *and* legal orders. Thus, he cast in almost Darwinian terms that those legal rules, institutions, and morality which contributed best to economic growth and liberty would survive.

Hayek saw evolved customary law (which he also referred to as 'grown law') as developing in parallel with free competition and providing the institutional infrastructure for economic and individual freedoms. This spontaneous legal order was often portrayed as the English common law, although Hayek was clear that there was an active role for legislation enacted by the state and that the common law could evolve in unsatisfactory ways. As will be shown below, while the common law has many attractive features, the way the English common law evolved during the industrial revolution treated freedom of contract as more important than freedom to trade. This led to a clash between two core liberal principles, with the English common law favouring freedom of contract even when it resulted in monopoly and anticompetitive agreements.

Hayek recognised the 'incorrect' tendency of common law to adopt a laissez-faire approach and the need for it to be corrected and augmented by a positive programme of pro-competition policies by the state.

Law and legislation

Hayek (1973) challenged the idea that 'law' was only that handed down by Parliament, the legislature or government. He distinguished law (as he defined it) from legislation. Law evolved from customary practices applied by judges to resolve disputes. It was based on experience, custom, practice and general principles. Legislation, on the other hand, was based on theory, design, purpose and prescription – it was 'made law' as opposed to 'grown law.'

Law administered by judges provided the necessary incentives for the adaption to change rather than specific commands. Indeed Hayek (1979: 95) saw the judge as 'an institution of a spontaneous order' and went further to treat judge-made law as the 'law of liberty' (Hayek 1973: 94), asserting that 'the ideal of individual liberty seems to have flourished chiefly among people where, at least for long periods, judge-made law predominated'. Grown law was presented by Hayek as institutional counterpart of free competition.

While Hayek saw 'law' as more consistent with liberal principles, he was far from an uncritical supporter of law or opposed to legislation and Government involvement in economic activity. According to Hayek (1960: 220): '[F]reedom of economic activity had meant freedom under the law, not the absence of all government action.' It is also true that Hayek's views about the development and role of law and legislation are not often consistent as shown by his treatment of the English common law.

English common law

Hayek often treats the English common law – which is 'law' established by precedent from decided cases common to all in England administered by judges of the Royal courts – as evolved customary law and consistent with liberalism. One can see why Hayek was attracted to the common law – unplanned, spontaneous, evolving, based on practice, experience, custom and precedent, setting out ex post negative rather than prescriptive obligations, enforced by independent judges with the sole purpose of resolving disputes. The common law when based on custom and precedent

was more likely to have been fashioned to the needs of commerce and society, and less susceptible to the influence of sectional interests or as a vehicle to redistribute income. In short, it was like the market – a decentralised system of evolved law.

Unfortunately, Hayek, together with his followers and critics, confused customary law with the common law. The common law, while it had many features that promoted economic growth (Mahoney 2001), did not evolve to protect competition as has often been claimed. Here, the reasons why are set out, showing that there was a clash between the two liberal principles of freedom of contract and freedom to trade influencing the development of English common law. This was recognised by Hayek when he advanced the case for legislation to reform the common law to protect competition.

Freedom to contract or trade?

From the time of the Magna Carta to around the seventeenth-century efforts were made to strike down 'privileged' monopolies created by successive English monarchs as a way of raising revenues, and restraints of trade that restricted individual liberty. These efforts were not spontaneous bottom-up creations but the outcome of a battle between the monarch and a Parliament made up of landed barons. Parliament was supported by the common law judges who wanted to wrench judicial power from the King's courts. From the Magna Carta (1215 and its successive reissues in 1216, 2017 and 1225) onwards there raged a battle not to ban monopolies but to decide who had the right to create monopolies – the Crown or Parliament. In the end, Parliament prevailed.

It is frequently claimed that the common law acted as a bulwark against monopoly and promoted free trade. This rests largely on Sir Edward Coke's (1552–1634) report of the seventeenth-century *Darcy*[3] case which struck down a playing card monopoly granted by Queen Elisabeth I. His interpretation has been largely discredited by legal historians (Letwin 1965) who claim that Coke invented the idea that the common law was opposed to monopolies. The English Statute of Monopolies 1624,[4] which Coke represented as a codification of the common law, was not based on a preference for competition but a constitutional objection to the Crown granting monopolies. The Statute of Monopolies banned all royal

3 *Darcy v. Allen (The Case of Monopolies*) (1603) 77 Eng. Rep. 1260 (K.B.).
4 An Act concerning Monopolies and Dispensations with Penal Laws, and the Forfeitures thereof (Statute of Monopolies), 21 Jam., c. 3 (1624).

monopolies, created patents ‘to the true and first Inventor’ (and hence marked the beginning of modern patent law) and handed over control of monopoly privileges to the common law courts. The statute did not prohibit monopolies – it gave Parliament the exclusive right to create monopolies and preserved the monopoly rights of the Guilds and city corporations to control trades and local markets.

Against this background, the common law took over from and incorporated customary law and the myriad of other legal systems and courts in England (local, merchant, ecclesiastical). These different legal systems and their courts competed with one another for business creating a competitive legal system (Veljanovski 2009). The consolidation of the courts and into one common law was begun by Henry II (1132–1189), who dramatically removed the dominance of ecclesiastical law with the murder of Thomas a Beckett in the 12th century. Over the ensuing centuries, English law was integrated into the common law under the administration of the Royal Courts of Justice which were ultimately controlled by Parliament (which itself was a court and which to 2009 the House of Lords (the second chamber of the UK Parliament) was the highest court in England and many Commonwealth countries).

The common law evolved from the late 1700s during the industrial revolution under the growing influence of laissez-faire doctrines (Trebilcock 1986). It began to treat agreements in restraint of trade and to operate a cartel as no different from any other contract under the guise of freedom of contract. These were treated as void only if unreasonable between the parties.

Toward the end of the nineteenth century, the English courts began effectively to enforce anticompetitive restraints of trade. This contrasted with the development of the common law in the USA especially after the enactment of the Sherman Act 1890 which ‘codified’ the common law but left it to judges to interpret. They adopted a more pro-competitive interpretation of the law. The English courts did not take account of the restrictive effects of a combination, trust, cartel and/or joint venture on consumers, competition and the public at large. These ‘public policy’ considerations were ignored by the judges for what must be said a very Hayekian reason – they did not feel competent to assess the wider consequences that restrictive contractual arrangements would have on the economy and markets at large.

By the 1890s freedom of contract had displaced freedom to trade in the English common law. As Dyson Heydon (2008:28) observed 'it seemed clear by the end of the First World War that English law would rarely invalidate a cartel.' This continued to well into the 1900s in England and many of its dominions (ex-colonies) when the common law was replaced by statutory competition laws which initially were also relatively permissive of agreements that restricted competition for a further several decades.

It may strike the reader as odd that freedom of contract should become the enemy of freedom to trade. Yet, despite Hayek's sympathy with the common law, this is what he saw had happened and he judged that the common law needed correction; and correction by legislation because it was not the role of judges to make law. As Hayek stressed, allowing individuals and firms to enter contracts to restrain competition is not consistent with a liberal legal order. If competition guarantees liberty, then the law must guarantee free competition, and hence override consensual anti-competitive agreements. As Hayek (1948 [1947]:115–16) makes clear:

> 'Freedom of contract' is in fact no solution because in a complex society like ours no contract can explicitly provide against all contingencies and because jurisdiction and legislation evolve standard types of contracts for many purposes which not only tend to become exclusively practicable and intelligible, but which determine the interpretation of, and are used to fill the lacunae in, all contracts which can actually be made. A legal system which leaves the kind of contractual obligations on which the order of society rests entirely to the ever-new decision of the contracting parties has never existed and probably cannot exist. Here, as much as in the realm of property, the precise content of the permanent legal framework, the rules of civil law, are of the greatest importance for the way in which a competitive market will operate. The extent to which the development of civil law, as much where it is judge-made law as where it is amended by legislation, can determine the developments away from or toward a competitive system, and how much this change in civil law is determined by the dominant ideas of what would be a desirable social order is well illustrated by the development, during the last fifty years, of legislation and jurisdiction on cartels, monopoly, and the restraint of trade generally. It seems to me that no doubt is possible that this development, even where it fully maintained the principle of 'freedom of contract,' and partly because it did

so, has greatly contributed to the decline of competition. But little intellectual effort has been directed to the question in what way this legal framework should be modified to make competition more effective.

The rule of law

To define the boundary between just and unjust law Hayek invoked another legal principle – the rule of law. For Hayek (1960: 222), the 'rule of law … provides the criterion which enables us to distinguish between those measures which are and those which are not compatible with a free system'. The emphasis put on the rule of law as an essential condition of a free and liberal society is understandable. To Anglo-American lawyers this means that actions by the state must be in accordance with the law and not arbitrary and capricious decisions of those in power. This conception of the rule of law together with its procedural safeguards such as habeas corpus do not however distinguish just and unjust laws. As has been pointed out, a totalitarian state can operate according to the letter of the law and remain unjust, oppressive and illiberal (Posner 2005).

Fortunately, Hayek (1960) worked with a broad concept of the rule of law which drew on the nineteenth-century German concept of *Rechtsstaat.* In its substantive sense (*materieller Rechtsstaat*) this required general, purpose-independent laws which apply to everyone, and provide a framework in which individuals are free to make their own choices. These laws should be known and certain, prohibiting certain actions rather than prescribing individuals to take specific actions. It also requires the separation of powers, an independent judiciary; the full judicial review of administrative and executive discretion where it affects individual liberty; and full compensation where individual rights are expropriated to ensure that the public benefits exceed the private losses.

Hayek's legal liberalism

In my view, Hayek's legal theory draws not the existence of a spontaneous legal order tempered by the rule of law but the primacy of free competition and liberty, with liberty defined by Hayek as the absence of coercion. It is this which led Hayek to set out a positive agenda for government legislation and activities designed to support free competition and plug the gaps where the market 'failed.' Hayek was not even averse to state enterprises provided they were not monopolies and did not receive preferential

subsidies. Indeed, Hayek (1944: 27) states this explicitly several times in his writings:

> The liberal argument is in favour of making the best possible use of the forces of competition as a means of co-ordinating human efforts, not an argument for leaving things as they are. It is based on the conviction that where effective competition can be created, it is a better way of guiding individual efforts than any other. It does not deny, but even emphasises, that, in order that competition should work beneficially, a carefully thought-out legal framework is required, and that neither the existing nor the past legal rules are free from grave defects. Nor does it deny that where it is impossible to create the conditions necessary to make competition effective, we must resort to other methods of guiding economic activity.

Hayek on competition policy

Unlike his fellow Austrian economists, Hayek did not treat monopolies and restraints of trade as transitory benign 'competitive' solutions to the existence of economies of scale and 'destructive competition' respectively (Armentano 1986: 64–6). The consensus view among Austrian economists was that the only genuine monopoly was a government backed monopoly protected by the state. This in turn meant there was no need for antitrust. As Israel Kirzner (1997) put it, '[T]he only government action needed to ensure the dynamically competitive character of market activity is to remove all … government-created obstacles.' (See also, Mises [1949], Rothbard 1970, Armentano 1986, Block 1994). Austrian economists (particularly those residing in the USA, which is now the school's intellectual home) would repeal all antitrust laws.

As we shall see, Hayek's position was more subtle and nuanced. He saw a greater role for the state in setting up the legal infrastructure of a liberal society including antitrust law.

Big is not bad

Hayek was not exercised by the size of firms or the growth of large corporations. According to Hayek (1979: 77), 'there is no possible measure or standard by which we can decide whether a particular enterprise is too large'. There can be no general rule about the desirable size since this will depend on the ever-changing technological and economic conditions, and there will always be many changes that will give advantages to enterprises that may appear by past standards an excessive size. The most 'effective size of the firm is 'one of the unknowns to be discovered by the market process.'

On the 'big is bad' thesis that lies at the heart of the current call for a more 'aggressive antitrust,' Hayek (1979: 77) in response to similar concerns in the 1970s had this to say:

> The misleading emphasis on the influence of the individual firm on prices, in combination with the popular prejudice against bigness as such, with various 'social' considerations supposed to make it desirable to preserve the middle class, the independent entrepreneur, the small craftsman or shopkeeper, or quite generally the existing structure of society, has acted against changes caused by economic and technological development. The 'power' which large corporations can exercise is represented as in itself dangerous and as making necessary special governmental measures to restrict it. *This concern about size and power of individual corporations more often than perhaps any other consideration produces essentially antiliberal conclusions drawn from liberal premises.* (author's emphasis)

It follows from this and Hayek's dynamic theory of competition that an atomistic market consisting of many small firms was not synonymous with competition nor is it the appropriate counterfactual, i.e., the benchmark against which real-world outcomes should be compared. Monopoly and oligopoly (a few firms) may be a more efficient way to organise production because they produce goods more cheaply. And there is nothing 'wrong in the "monopoly" profit of an enterprise capable of producing more cheaply than anybody else' (Hayek 1997: 83). High prices and profits are a reward for some factor unique to the firm, and act as an incentive to other firms to challenge a profitable monopoly.

Monopoly as a minor problem

Hayek regarded monopoly in the absence of government privileges as a minor problem that had been exaggerated. A monopoly that can produce most cheaply was not a market failure if there were no alternative firms that could produce as or more cheaply. As Hayek (1984: 330) said '[C]onsumers have scarcely any right to force such a producer to do as well as he can if he is already doing better than anybody else in the industry.' Monopolists did not have the power to fix their prices arbitrarily unless sheltered from competition.

While Hayek was sceptical that there was a significant monopoly problem in a free market in the absence of government privileges, he nonetheless accepted that 'enterprise monopolies' could arise and abuse their market power. In the section headed 'When monopoly becomes harmful' in *Law, Legislation and Liberty* (Vol. 3) Hayek (1979: 84) wrote:

> Quite generally it can probably be said that what is harmful is not the existence of monopolies that are due to greater efficiency or to the control of particular limited resources, but the ability of some monopolies to protect and preserve their monopolistic position after the original cause of their superiority has disappeared.

He continued:

> The main reason for this is that such monopolies will be able to use their power, not only over the prices which they charge uniformly to all, but over the prices which it can charge to particular customers. This power over the prices they will charge particular customers, or the power to discriminate, can in many ways be used to influence the market behaviour of these others, and particularly to deter or otherwise influence potential competitors.

Hayek also saw restraints of trade and cartels as a problem. Here his discussion is in the tradition of Adam Smith (1776: bk.1, ch.X, pt.II) who famously observed that merchants rarely meet but that the conversation ends in a 'conspiracy against the publick'.

Labour monopolies

Hayek's position on labour market competition was different. He did not focus on the market power of employers and their monopsonistic hiring practices but on the restrictive practices of trade (labour) unions. This reflected his general hostility to associations, whether capitalist or workers. Hayek (1960: 272) considered trade unions as 'economically harmful and politically exceedingly dangerous'. Their actions made the market ineffective and controlled the direction of the economy by their influence on relative wages and 'constant upward pressure on the level of money wages, with its inevitable inflationary consequences.' These passages were written in the 1970s and 1980s when trade unions were a rising power in the UK and across Europe engaged in industrial and civil unrest dislocating economies and fuelling inflation and stagflation. Today trade unions are

a shadow of their former selves with massively reduced membership and are virtually absent from the digital sector.

Hayek's liberal competition policy

According to Hayek (1947 [1949]: 113) 'measures required to ensure an effective competitive order' are changes to the law of property, contract, corporations and associations (especially trade unions), patents and copyright laws, taxation, international trade and only residually 'the problem of how to deal with those monopolies or quasi-monopolistic positions which would remain in a sensibly drawn-up framework'. That is, the whole legal infrastructure had to avoid fostering pro-monopoly and anticompetitive laws and privileges.

Reform of company law

Hayek (1947 [1948]: 116) believed, and this will surprise many, that company law (in the US called 'corporate law') fostered monopoly by giving the company/corporation the same status and rights of a 'legal person' together with limited liability:

> I do not think that there can be much doubt that the particular form legislation has taken in this field has greatly assisted the growth of monopoly or that it was only because of special legislation conferring special rights – not so much to the corporations themselves as to those dealing with corporations – that size of enterprise has become an advantage beyond the point where it is justified by technological facts.

Hayek was also opposed to corporations owning shares in other corporations but did not elaborate on these concerns.

Intellectual property rights as monopoly

Where Hayek had more to say was to question the legitimacy of intellectual property rights (IPRs) such as patents, trademarks and copyright. This was not an unusual view among economists during the 1940s, e.g., Plant (1974). Hayek (1947 [1948]: 113–14) saw IPRs as state-supported monopoly rights which impaired the competitive process:

> The problem of the prevention of monopoly and the preservation of competition is raised much more acutely in certain other fields to which the concept of property has been extended only in recent times. I am thinking here of the extension of the concept of property to such rights and privileges as patents for inventions, copyright, trade-marks, and the like. It seems to me beyond doubt that in these fields a slavish application of the concept of property as it has been developed for material things has done a great deal to foster the growth of monopoly and that here drastic reforms may be required if competition is to be made to work. In the field of industrial patents in particular we shall have seriously to examine whether the award of a monopoly privilege is really the most appropriate and effective form of reward for the kind of risk-bearing which investment in scientific research involves.

Hayek (1948 [1947]:114–15) argued that trademarks 'helped to create monopolistic conditions because trademarks have come to be used as a description of the kind of commodity, which then of course only the owner of the trade-mark could produce ("Kodak," "Coca-Cola").' He proposed that '[T]his difficulty might be solved, for example, if the use of trade-marks were protected only in connection with descriptive names which would be free for all to use.'

Hayek's views contrast with those of Schumpeter (and most economists today) who saw IPRs as a good thing because they incentivised firms to innovate by enabling them to appropriate the profits from their inventions and to fund risky R&D. As Schumpeter (1942: 102) put it, '[E]very successful corner may spell monopoly for the moment.'

Hayek's antitrust proposals

In the *Constitution of Liberty* Hayek (1960: 266) proposes that: 'Where monopoly rests on man-made obstacles to entry into a market, there is every case for removing them'.[5] He also believed that there was a strong case for prohibiting some types of price discrimination by the application of general rules.

5 Hayek's views on monopoly and antitrust are an under-researched subject, e.g., Paul (2005), Schrepel (2014) and Kusunoki (2015).

Contestability paramount

A key element of Hayek's view is the contestability of markets also called 'potential competition.' Firms in a competitive market are constantly challenged by rival firms with better ideas, technology and business acumen. Even a market dominated by a large conglomerate corporation will be challenged by other conglomerates 'diversified beyond definable industry categories.' As Hayek (1979: 79) aptly put it, '[S]ize becomes the most effective antidote to the power of size.' Hence the best 'antitrust policy' is to ensure that there are no government-created privileges and barriers to entry, which are typically the major source of monopoly power.

Banning exclusionary price discrimination

In *Law, Legislation and Liberty* Hayek (1979: 85) elaborated his vision of a 'liberal' antitrust asserting that monopolist's ability to price discriminate 'clearly ought to be curbed by appropriate rules of conduct' where 'market power consists in a power of preventing others from serving the customer better' (Hayek 1979: 72). Hayek accepted that price discrimination can be both pro- and anti-competitive, so a *per se* or absolute prohibition was not justified. He would only prohibit price discrimination where a non-privileged monopoly – that is one not protected by the state – selectively lowers prices to exclude its competitors, such as targeted discounts to customers where a monopolist faces a competitive threat. What Hayek appears to have in mind, although he does not use the term, is what today is called 'predatory pricing.'

To deal with such exclusionary price discrimination Hayek (1979: 85) would 'give potential competitors a claim to equal treatment where discrimination cannot be justified on grounds other than the desire to enforce a particular market conduct'. That is, those firms harmed by such actions would have the right to sue the 'monopolist' through the courts for their losses. This he believed was 'more in conformity with the rule of law' than enforcement by public competition regulators.

On cartels, Hayek (1979: 86) would 'declare invalid and legally unenforceable all agreements in restraint of trade, without any exceptions, and to prevent all attempts to enforce them by aimed discrimination or the like by giving those upon whom such pressures were brought a claim for multiple damages'. Again, Hayek (1979: 86) did not propose that cartels and other horizontal agreements between rival firms and traders be prohibited outright. This was because '[T]here is … much reason to believe that

wholly voluntary organizations of firms that do not rely on compulsion are not only not harmful but actually beneficial.' He simply proposed to limit the role of law in coercing a firm or individual from being legally bound to agreements that restrain trade. Firms would be allowed to break away from a cartel arrangement without legal consequences and thereby undermine the stability of a cartel. Interestingly, Hayek (1979: 86) claimed that 'Section One of the Sherman Act 1890' which outlawed combinations, 'has been remarkably successful in creating in the business world a climate of opinion which regards as improper such explicit agreements to restrict competition'.

Private enforcement

Hayek (1979: 87) proposed that antitrust be privately enforced through the courts. Those harmed by exclusionary price discrimination and enforced restraints of trade would have the right to sue those who had acted illegally in the courts. This contrasts with the existing approach of the public enforcement of antitrust laws by government agencies backed by mostly civil sanctions. Hayek argued that the public officials in these organisations would not have the information to identify genuine monopoly abuses and would be tempted to distinguish good from bad monopolies and thereby exercise their discretion to 'perforate' the law with exemptions creating a discriminatory system of law enforcement.

The effectiveness of Hayekian antitrust

Hayek's antitrust proposals are modest and short on detail. The basic thrust of Hayek's proposals is consistent with, though considerably narrower than, European competition law. Under Article 102 of the Full Treaty of the European Union (TFEU), which is the equivalent of Section 1 of the US Sherman Act 1890, the focus is on protecting competition by prohibiting exclusionary practices of dominant firms. Article 101 TFEU prohibits anti-competitive practices such as price-fixing and other restraints of trade although it exempts horizontal agreements which generate efficiencies if they are shared with consumers. While the law is publicly enforced, which Hayek disapproved of, it allows competitors and consumers to sue those breaking the law for compensatory damages.

This similarity is not coincidental, as European competition law was, and to some degree still is, influenced by the Freiburg or the Ordoliberal school founded in the 1930s by economist Walter Eucken and lawyers Franz

Böhm and Hans Großmann-Doerth. The Ordoliberals like Hayek viewed the free economy as a legal-juridical construction, but with an emphasis on 'social justice' which Hayek rejected. It provided the 'ideological' basis for Germany's post-war social market economy and influenced European competition law.

Hayek's acceptance of exclusionary price discrimination as the single most egregious monopoly abuse jars with the thinking of other Austrian and Chicago School economists. Both take the position that genuine cases of predatory pricing are as rare as unicorns. To them, there is only one monopoly profit and there is no need for a monopolist to sacrifice its profits to reinforce its monopoly position (McGee 1958). Most contemporary antitrust economists, lawyers and regulators reject this view and hence Hayek is more in line with current thinking in this area.

Hayek's proposals are not as straightforward as he would have the reader believe, nor necessarily consistent with his liberal view. Reducing prices to meet a rival's price is a routine competitive response, and so determining whether the action is exclusionary or not is not easy. Hayek (1979: 85) notes that '[T]he problem can therefore not be solved by imposing upon all monopolists the obligation to serve all customers alike but that 'it would not be desirable to make all discrimination illegal.' His theory of harm, to use a modern antitrust term, would still require the courts and litigants to establish that a firm was a monopolist, and then distinguish bad from good price discrimination. Hayek gives no guidance on how this is to be done – and recall he was against the courts making such judgments as this was discriminatory and therefore illiberal.

Applying Hayek's proposal to the digital sector is problematic. The online sector is rife with price discrimination whether in the form of wide price variations, overt price discrimination and personalised pricing (third-degree price discrimination where every customer is charged a different price which is the highest price, they are willing to pay) facilitated by pricing algorithms. These, it is true, are focused on customers rather than competitors.

Hayek was not against cartels and restraints of trade as such, only those that involved some form of coercion against a party to such agreements. Making a restraint of trade or cartel unenforceable deals with this concern. But it is a partial solution as he would confine the illegality to the unreasonableness of the restrictive agreement to the parties to the agreement, ignoring the harmful effects to consumers and other third

parties. A cartel whose members are happy colluding to overcharge their customers would escape unscathed. It seems that the force of the proposal is confined to restraints such as restrictive covenants, non-compete clauses and long-term restrictive contracts where the individual worker or firm is prevented from competing.

Summary

Hayek saw that both law and legislation were required for free competition and that both were in practice flawed. While the English common law was more likely to promote economic growth it did not protect competition by putting freedom to contract (laissez-faire) above freedom to trade. Hayek's first best policy was to remove all government barriers to entry and make the market as contestable as possible while reforming company and intellectual property law to avoid the artificial creation of monopolies and market power. In this setting and with these policies monopoly was a minor but nonetheless present. He proposed two modest antitrust laws – prohibit exclusionary price discrimination by monopolists; and make contracts in restraint of trade unenforceable. These laws were to be privately enforced by giving those harmed the right to sue for multiple damages facilitated by lawyers who are paid contingency fees (a fee based on the outcome of the damages awarded if the legal claim succeeds).

Assertive antitrust and the digital economy

Big tech as a monopoly problem

The present call for more 'assertive antitrust' has in large part been fuelled by disquiet over the actions and effects of the large online platforms Meta, Google, Amazon, Microsoft and Apple; collectively labelled 'big tech.' It is alleged that these digital platforms are out of control, aggregating to themselves tremendous economic and political power which must be urgently checked. It is also claimed that their actions over the past decade reveal gaps and deficiencies in current antitrust laws. Specifically, that the consumer welfare standard used in antitrust is not fit for purpose; that its 'price centric' focus fails to take account of the complex dynamics of constantly evolving digital 'ecosystems,' and that competition authorities have allowed big tech to gobble up their potential competitors. Thomas Philippon (2019) in his *The Great Reversal* subtitled *How America gave Up on Free Markets* argues that the failure to vigorously enforce US antitrust has been responsible for a less competitive and poorly performing US economy.

Many of the above concerns crystallised in 2019 with an avalanche of official and academic reports calling for the greater regulation of big tech, e.g., Crémer et al (2019) commissioned by the European Commission, the Furman Report (2019) commissioned by the UK government, and in the USA the Stigler Center Report (2019). There rapidly followed concrete reforms of antitrust and merger laws in the EU, the UK and elsewhere.

The need to increase the regulation of big tech has gained political and legal traction in Brussels, Washington, London and across the world. The US Federal government plans more aggressive antitrust enforcement based

on broader principles that hark back to the US trustbusting era variedly referred to as 'neo-Brandeisian' (after Louis D. Brandeis an influential US jurist at the beginning of the twentieth century during the formative years of US antitrust), 'populist' and 'hipster' antitrust. These treat big as bad and want antitrust law to protect small businesses as a basis for a more pluralistic and democratic society. President Biden's administration has endorsed this view, appointing high-profile critics of big tech to key positions such as Lina Kahn (2017, 2018, 2019) as Chair of the Federal Trade Commission (FTC), Jonathan Kanter as Assistant Attorney General of the Department of Justice's Antitrust Division, and Tim Wu (2018) to the Economic Council.

European antitrust has been more assertive, imposing heavy fines on Microsoft, Google, Amazon and Apple. It is less sympathetic to monopolies than US antitrust, and while there has been some convergence between the two antitrust laws, especially the greater use of economics to guide their enforcement, this can often be more apparent than real. Nonetheless, across Europe, the sentiment is that the European Commission and national competition regulators have been too accommodating to big tech. Overlaying all these efforts is the European Commission's (2020) plan to create a European digital sector powered by its vision of 'European technological sovereignty' – a European society powered by digital solutions rooted in common European values. This reflects the fact that there are no successful European digital platforms, and that big tech in Europe is a US-based enterprise. The European Commission has passed its Digital Markets Act which will replace antitrust to directly regulate large online platforms designated as 'gatekeepers' including the possibility of breaking them up.[6] The UK has followed in Europe's footprints with draft legislation to replace competition law with new ex ante regulation of digital 'gatekeepers that have strategic market status' (SMS) (Hewson and Veljanovski 2022).

Some economics of digital online platforms

The backlash against big tech is built in part on the economic theory of network effects that are said to make online platforms 'natural' monopolies, 'essential facilities' and 'gatekeepers' that systematically squash competition along their respective supply chains.
Network effects are demand-side economies of scale which increase the

6 'Digital Services Act package – ex ante regulatory instrument of very large online platforms acting as gatekeeper' (https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12418-Digital-Services-Act-package-ex-ante-regulatory-instrument-of-very-large-online-platforms-acting-as-gatekeepers)

value proposition to consumers the more consumers use the platform. This means that a large platform generates more individual and aggregate consumer benefits than a smaller platform. This it is argued can generate 'winner takes all' competition (also known as 'competition for the market') that eventually tips online platform markets into a monopoly. This combined with cost economies of scale, exclusionary tactics, and the 'killer acquisitions' of potential competitors makes big tech virtually impregnable to a competitive attack.

There are sound reasons to question this application of network effects (Veljanovski, 2022a & b). Network effects create a structural issue for digital markets which may limit the number of competing networks, but this is not pre-ordained, nor are large networks immune from unravelling in the face of competitive entry and challenge. Just as network effects can create positive feedback effects that serve to reinforce a larger network's growth, they can also generate negative feedback effects when the network starts losing consumers to rivals. Even those who promote a pessimistic view of network effects exercise caution since network effects imply that greater consumer benefits come from the larger successful online platforms. Moreover, online platforms even if monopolies are vastly different beasts from the stereotypical dominant industrial or conglomerate monopoly corporation. They are dynamic businesses which are constantly innovating, offering consumers new and better services typically to stay ahead of the game and the wall of potential competitors. Google, Microsoft, Amazon and Meta are consistently ranked as the most innovative firms globally. They collectively invested over US$71 billion in 2017 in R&D, second only to the pharmaceutical sector. Big tech may look like a monopoly, but it does not behave as a classic monopoly that restricts output and overcharges its customers.

These observations are not to downplay the potential for abusive practices. Success and the provision of cheap and innovative services do not excuse attempts to exclude competition.

What Hayek might have said

Hayekian competition policy embodies several core features – the removal of all state privileges that support a monopoly, and a focus on dynamic and potential competition making markets and monopolies contestable.

The first of these – the removal of government support of monopoly – implies a radical agenda. As already mentioned, it would lead to the abolition or at least the radical reduction in the protection given by IPRs such as patents and copyright. Hayek's concern about the anti-competitive effects of IPRs is reinforced by the way the patent system was subsequently developed. The US patent system has been described as 'broken,' with its permissive granting of patents for inventions that are not novel, and the way patents are used to thwart the innovative process (Jaffe and Lerner 2004). The abolition of patents would have a dramatic impact on the digital sector as intellectual property rights are one of its main assets.

The distortive and monopoly-producing tendencies of company, employment, tax laws and especially lax monetary policy also warrant attention. These are inherently discriminatory and also because the global reach of big tech's activities can be exploited that among other things disadvantage of bricks-and-mortar firms.

Hayek would have rejected the basis of much of today's antitrust laws. He did not endorse the consumer welfare standard nor the greater use of economics which guides EU and US antitrust. Hayek's approach was a supply-side theory of competition concerned with ensuring free competition because it was consistent with liberal society and best promoted economic growth. A liberal antitrust law would seek to maximise output by protecting the competitive process rather than pursuing the misnamed consumer welfare standard. As already discussed, he would have supported the closure of public competition authorities such as the European Commission competition directorate (DG COMP) and the UK Competition and Market Authority (CMA) and moved to private enforcement through the courts encouraged by multiple damage awards.

Hayek would have despaired at the static approach of much competitive and antitrust analysis, and the failure to develop a genuinely dynamic information-based approach. Competition regulators apply a largely static model of competition-based narrow market definitions (European Commission 1997) taking a short-term approach. This is likely to identify

a monopoly problem where none exists or would most likely be eroded by competitive forces.

Some reforms to competition law would have been endorsed by Hayek, such as the use of the broader concept of a 'digital ecosystems' in place of the present market definition approach, and the greater recognition of innovation and dynamic considerations in the assessment of competition.

Unfortunately, while promoters of competition have sought to incorporate dynamic considerations in their framework these are typically ad hoc considerations and often deployed to paint a pessimistic picture of the competitive processes in the digital sector. This has been the experience of its use by the CMA. In its revised merger assessment guidelines (CMA 2021) the CMA placed greater emphasis on dynamic and potential competition when assessing proposed mergers. This should have heralded a greater sensitivity and disinclination to intervene if a Hayekian approach had been adopted. Instead, the concepts of dynamic and potential competition, together with the precautionary principle, have been used to expand the scope of intervention to areas in which it is hard to see a real threat to present or future competition.

A recent example is the CMA's decision to block and unwind Meta's acquisition of Giphy. In a controversial application of dynamic competition, the CMA concluded that the merger was likely to reduce future competition. There was no evidence of this, and the standard of proof was vanishingly low. On appeal, the UK Competition Appeal Tribunal (CAT) accepted the CMA's approach giving it almost unfettered discretion on how to apply dynamic competition to assess mergers.[7] It did, however, suggest that the CMA should adopt a more balanced approach by also considering the likely future harm to competition if the CMA's speculations were wrong.

The Meta/Giphy decision together with the CMA's other recent merger assessments confirm its increasingly interventionist approach. The pendulum has now swung from a relaxed position regarding vertical and conglomerate digital mergers, to one where any perceived concern no matter how speculative of reduced future competition will be sufficient grounds to block a merger, should the CMA so desire.

7 *Meta Platforms Inc. v CMA* [2022] CAT 26.

On the other hand, there are difficulties surrounding with the use of innovation and dynamic competition which arise from their lack of specificity and speculative nature (e.g., Teece 2021). As Hayek showed, these approaches are inherently flawed because they fail to deal with the 'information problem,' i.e., bureaucracy and experts simply cannot predict whether the current and some hypothetical future market structures are likely to lead to greater innovation and cheaper products. Hayek stressed that these were complex systems that do not lend themselves to simplistic and deterministic analysis. This is aptly illustrated by Hovenkamp's (2008: 2) observation that: 'While innovation overall creates an enormous payoff to society, predicting successful innovations on a case-by-case basis is a fool's errand.' He gives the example of Viagra, a drug treatment for angina with the undesirable side effect of protracted male erections that become one of the most successful pharmaceuticals. Petit and Schrepel (2022) propose applying complexity theory to antitrust as more in line with Hayek's view of competition.

Paradoxically, while Hayek's central concern was information, data and knowledge his approach contributes little to our understanding of big data and its role in a digital economy. The Furman Report (2019) claimed that '[T]he evidence suggests that large data holdings are at the heart of the potential for some platform markets to be dominated by single players, and for that dominance to be entrenched in a way that lessens the potential for competition.' Despite its claim, Furman cited no evidence (Veljanovski 2022a). The economics of information and data, and a Hayekian approach to the same, is vast and cannot be usefully explored here.

Digital monopolies?

Hayek would have seen market forces as constantly challenging established platforms. He would not have seen the rigid division between the various large online platforms. Google, Meta and Amazon are constantly watching each other to protect their respective markets and seize opportunities by encroaching on the others' markets/services.

On the other hand, it is far from clear that Hayek would have opposed all aspects of recent antitrust actions against large online platforms. European and US antitrust laws are, like Hayek's proposals, focused on exclusionary conduct. Such practices are at the core of the alleged 'abuses' recently investigated by the European Commission against Microsoft, Google and Amazon. While Hayek confined his antitrust proposals to exclusionary

price discrimination, his concerns could be read as applying to all discriminatory tactics designed to exclude otherwise effective competitors (although this is the author's speculation only).

One area which has recently raised significant concerns is the vertical integration of the large online platforms. Hayek had nothing to say about this. Vertical integration raises a problem when the 'dominant' online platform acts to foreclose the downstream market in which it competes with others by engaging in anticompetitive abuse designed to exclude, weaken or limit its rivals. In the digital arena, this includes such practices as a margin squeeze, enforced bundling of products (tie-in sales), predation, refusal to deal and give network access, self-preferencing and/or degrading, delaying and blocking interoperability to downstream competitors. These online platforms also have the advantage of collecting information on their downstream competitors' users and usage, and their algorithms will rank their competitors and their competitors' services. This inevitably creates a conflict of interest as the platform acts as both 'umpire and player.' Hayek would have been inclined (in my opinion) to treat online platforms as the basic infrastructure of digital markets and take the view that self-dealing by such market makers would have implications for free competition when accompanied by such practices.

One discriminatory practice – 'self-preferencing' – has attracted considerable attention. This is where an online platform gives preferential treatment to its products and/or services that compete downstream with third-party sellers of similar products and/or services using its online platform. Google, for example, operates a search engine while being a major provider of online advertising space and specialised search services such as comparison shopping. Self-preferencing has been described as 'internal discrimination.' This was the crux of the European Commission's *Google Search (Shopping)*[8] decision of 2017. The European Commission found that Google gave favourable positioning and display to its comparison-shopping service in its search results pages thereby disadvantaging other merchants using its search engine. It was fined €2.4 billion.

8 Case AT.39740 *Google Search (Shopping),* Commission decision of 27/06/2017. Case T-612/17 *Google and Alphabet v Commission* General Court Judgment of 10 November 2021; Case AT.40.099 *Google Android* Commission decision of 18/07/2018; Case AT.40.411 *Google Search (Adsense),* Press release 20/03/2019.

Whether this impaired competition is another question. And like most laws, the devil is in the detail. One aspect was the low threshold used by the European Commission and European courts to find an abuse of dominance. Despite the Commission's endorsement of consumer welfare, the European Commission's test to 'prove' anti-competitive self-preferencing is 'behaviour that tends to restrict competition or is capable of having that effect, regardless of its success' (*Google Search* para 339). The European Commission is not legally required to establish actual or likely harm to competition or consumers. The evidence that Google abused its dominance was that its shopping services reduced traffic to its competitors' search pages and its general search results pages, and generic search traffic is important to comparison websites and has no substitutes. However, this was also consistent with Google providing a better service. The irony is that self-preferencing is more rampant in the brick-and-mortar sector and has been practiced by department stores for the last century. UK supermarkets dedicate more self-space to their private label products (i.e., products displaying their brand name or brands connected with their chain) with the practice pioneered by the Tesco supermarket chain which today monitors its customers' purchasing behaviour perhaps more intensely than many online platforms. Amazon has only between one and two per cent private label e-commerce sales compared to most of the big retailers with double digit private label sales. Furthermore, because the European Commission's investigations are often instigated following complaints by rivals of the allegedly dominant entity, this leads to a tendency to treat harm to competitors as evidence of harm to competition (and consumers). These are not the same thing, as any competition lawyer and economist will tell you.

The Commission's approach contrasts with the earlier English High Court decision in *Streetmap.EU v Google.*[9] There the court held that Google's inclusion of the thumbnail map in the new-style OneBox was a technical improvement that benefitted consumers and was not anticompetitive even though it led to reduced traffic to Streetmap, which was established in the market. The court, applying the same legal principles as the European Commission, said its determination boiled down to the counterfactual of whether there was a less distortive alternative available that could provide the same benefits to users as the new-style OneBox without imposing an unreasonable and impractical burden on Google. The court found that there was not (in very Hayekian terms).

9 [2016] EWHC 253 (Ch).

Mergers and breakups

Hayek would not have supported the breakup of large corporations and big tech now under active consideration in Brussels and Washington (Kahn 2017 2019). It is true that in the condensed version of Hayek's (1945b [2005]: 46] *Road to Serfdom* published in the *Readers Digest* the breakup of monopolies is said to be 'a basic requirement'. However, this was added to the condensed version of Hayek's work and does not appear in the book or any of his subsequent writings. The breakup and vertical separation of online platforms risk reducing efficiency and innovation. It is neither Hayekian nor Schumpeterian as it channels competitive forces in specific directions and sacrifices the effective competition of rival online platforms as they transgress industry boundaries. This structural approach is not based on a realistic picture of the competitive process but on a desire to fragment markets based on a political preference favouring small units against large corporations which are seen as destroying individualism.

Hayek had very little to say about mergers and acquisitions. The present concern that large online platforms have made 'killer acquisitions' of smaller nascent firms which one day in the future would have grown into effective competitors is based on weak evidence and is overblown. It is leading to a more restrictive and discriminatory, regime for digital mergers than applied to firms in the rest of the economy. The increased adoption of a precautionary principle in dealing with digital mergers risks reducing the competitive dynamics in the digital sector with long-term harm to consumers and reduced innovation. And it requires an unwarranted belief that regulators can predict the future (see Hewson and Veljanovski 2022). There are numerous examples where large communications conglomerates made what at the time was regarded as critical acquisitions that subsequently failed, such as the AOL/TimeWarner and MySpace/News Corp mergers, and Yahoo's acquisitions.

Where now for Hayek?

This brings us to the relevance of Hayek's work to the present concerns over competition in digital markets and antitrust. Much antitrust law is based on static models of competition. As Hayek emphasised, markets are dynamic creatures, and our knowledge is limited when we try to steer them in certain directions. Hayek's writings on industrial organisation and industrial policy are surprisingly few. He, like other Austrians, believed that the monopoly problem was exaggerated and part of the reason for this was the use of perfect competition as the benchmark or counterfactual.

It is therefore not surprising that Hayek is rarely referred to and used as a model for the reform of competition law and antitrust. Many have taken his insights and integrated them into their view of competition to try and develop a better understanding of the complex nature of markets and knowledge. But there is, as we have seen, no easy way to translate Hayek's insights into a framework that will enable a better understanding of the competitive forces that are emerging in the digital sector, especially the mechanics of competition among digital platforms. That requires more attention than has been given above. It is hoped that the discussion here will stimulate efforts to develop a Hayekian approach to competition policy in the digital sector.

References

Al-Ubaydli, Boettke, P. and Albrecht, B. C. (2022) Testing the Hayek hypothesis: Recent theoretical and experimental evidence. *Plos One* 17(7): e2070489.

Armentano, D. T. (1986) *Antitrust Policy – The Case for Repeal*. Washington, DC: Cato Institute.

Arthur, W. B. (2021) Foundations of complexity economics. *Nature* 3: 136–45.

Block, W. (1994) Total repeal of antitrust legislation: A critique of Bork, Brozen, and Posner. *The Review of Austrian Economics* 8: 35–70.

Bowles, S., Kirman, A. and Sethi, R. (2017) Friedrich Hayek and the market algorithm. *Journal of Economic Perspectives* 31(3): 215–30.

CMA (2021) *Merger Assessment Guidelines.* Competition and Market Authority. CMA 219.

Coase, R. H. (1937) The nature of the firm. *Economica* Vol. 4: 386–405.

Coase, R. H. (1992) The institutional structure of production: 1991 Alfred Nobel Memorial Prize lecture in economic sciences. *American Economic Review* 82: 713–19.

Crémer, J, de Montjoye, Y-A and Schweitzer, H (2019). *Competition Policy for the Digital Era: Final Report*. Brussels: European Commission.

Dickinson, H. D. (1933) Price formation in a socialist community. *Economic Journal* 43(170): 237–50.

European Commission's (1997) *Market Definition Notice* (97/C 372/03).

European Commission (2020) *Communication: Shaping Europe's Digital Future.* 19 February.

Evans, D. S. and Schmalensee, R. (2016) *Matchmakers – The New Economics of Multisided Platforms*. Cambridge, MA: Harvard Business Review Press.

Ezrachi, A. and Stucke, M. E. (2016) *Virtual Competition: The Promise and Perils of The Algorithm-Driven Economy*. Cambridge Mass.: Harvard University Press.

Furman Report (2019). *Unlocking Digital Competition. Report of the Digital Competition Expert Panel*. London: HM Treasury.

Hayek, F. A. (1944) *Road to Serfdom.* London: George Routledge & Sons.

Hayek, F. A. (1945a) The use of knowledge in society. *American Economic Review* 35(4): 519–30.

Hayek, F. A. (1945b) [2010] The Road to Serfdom. *Readers Digest* April. Reprinted by Institute of Economic Affairs.

Hayek, F. A. (1947) [1948] 'Free' enterprise and competitive order. Chapter 11 in *Individualism and Economic Order.* Chicago: University of Chicago Press.

Hayek, F. A. (1948) The meaning of competition. Chapter 10 in *Individualism and Economic Order.* Chicago: University of Chicago.

Hayek, F. A. (1960) *The Constitution of Liberty*. London: Routledge & Kegan Paul.

Hayek, F. A. (1967) The theory of complex phenomena: A precocious play on the epistemology of complexity. In *Studies in Philosophy, Politics and Economics*. London: Routledge & Kegan Paul, pp. 22–42.

Hayek, F. A. (1968) [2002] Competition as a discovery procedure. *Quarterly Journal of Austrian Economics* 5(3): 9–23.

Hayek, F. A. (1973) *Law, Legislation and Liberty: A New Statement of the Liberal Principles of Justice and Political Economy – Rules and Order* Vol. 1. London: Routledge & Kegan Paul.

Hayek, F. A. (1974) The Pretence of Knowledge. Lecture to the memory of Alfred Noble. https://www.nobelprize.org/prizes/economic-sciences/1974/hayek/lecture/

Hayek, F. A. (1979) *Law, Legislation and Liberty: A New Statement of the Liberal Principles of Justice and Political Economy – The Political Order of a Free People* Vol. 3. London: Routledge & Kegan Paul.

Hayek, F. A. (1982) Two pages of friction – The Impossibility of socialist calculation. *Economic Affairs*, 2(3): 135-142. Reprinted (1984) The Essence of Hayek. (eds. C. Nishiyama and Leube, K. R.) Stanford: Hover Institution.

Hayek, F. A. (1984) [1991] *1980s Unemployment and the Unions*. Hobart Paper 87, 2nd edn. London: Institute of Economic Affairs. Reprinted Chapter 8, *Economic Freedom*. Oxford: Basil Blackwell.

Heydon, D. (2008) *The Restraint of Trade Doctrine.* 3rd edn. London: Lexis Nexis Butterworths.

Hewson, V. and Veljanovski, C. (2022) *Powering Up: How will the Digital Markets Unit Affect Competition and Innovation?* London: Institute of Economic Affairs.

Hovenkamp, H. (2008) Schumpeterian competition and antitrust. University of Iowa Legal Studies Research Paper No. 8-43. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1275986

Jaffe, A. B. and Lerner, J. (2004) *Innovation and Its Discontents – How our Broken Patent Systems is Endangering Innovation and Progress and What to Do About It.* Princeton: Princeton University Press.

Kahn, L. M. (2017) Amazon's antitrust paradox. *Yale Law Journal* 126: 710–805.

Khan, L. M. (2018) The new Brandeis movement: America's antimonopoly debate. *Journal of European Competition Law and Practice* 9: 131–3.

Kahn, L. M. (2019) The separation of platforms and commerce. *Columbia Law Review* 119: 973–1098.

Kirzner, I. M. (1997) *How Markets Work – Disequilibrium, Entrepreneurship and Discovery*. London: Institute of Economic Affairs.

Kusunoki, S. (2015) Hayek and antitrust. *History of Economic Thought* 61(1): 57–68.

Lange, O. (1967) The computer and the market. In *Socialism, Capitalism and Economic Growth: Essays Presented to Maurice Dobb* (ed. C. Feinstein and M. Dobbs) Cambridge: Cambridge University Press.

Lange, O. and Taylor, F. M. (1938) [1948] On the economic theory of socialism. In *On the Economic Theory of Socialism.* (ed. B. Lippincott) Minneapolis/Saint Paul: University of Minnesota Press.

Lavoie 1985 [2015]). *Rivalry and Central Planning: The Socialist Calculation Debate*. Arlington: Mercatus Center at George Mason University

Lerner, A. (1934) Economic theory and socialist economy. *Review of Economic Studies* 2: 51–61.

Letwin, W. (1965) *Law and Economic Policy in America.* New York: Random House.

Littlechild, S. C. (1986) *The Fallacy of The Mixed Economy: An 'Austrian' Critique of Recent Economic Thinking and Policy* (2nd edn). London: Institute of Economic Affairs.

McGraw, T. K. (1984) *Prophets of Regulation*. Cambridge, MA: Belknap Press.

Mahoney, P. G. (2001) The common law and economic growth: Hayek might be right. *Journal of Legal Studies* 30: 503.

McGee, J. S. (1958) Predatory price cutting: The Standard Oil (NJ) case. *Journal of Law and Economics* 1: 137–69.

Mises, L. von (1949) *Human Action: A Treatise on Economics* (4th revised edn). San Francisco: Fox and Wilkes.

Munger, M. M. (2021) *The Sharing Economy – Its Pitfalls and Promises*. London: Institute of Economic Affairs.

Paul, E. F. (2005) Hayek on monopoly and antitrust in the crucible of *United States v. Microsoft. New York University Journal of Law and Liberty* 1: 167–204.

Petit, N. and Schrepel, T. (2022) Complexity-minded antitrust. EUI Working Paper No. 7, https://ssrn.com/abstract=4050536 or http://dx.doi.org/10.2139/ssrn.4050536

Philippon, T. (2019) *The Great Reversal – How America gave up on Free Markets*. Cambridge, Mass.: Harvard University Press.

Plaka, P. (2020) Algorithmic central planning: Between efficiency and freedom. *Law and Contemporary Problems* 83: 125–48.

Plant, A. (1974) *Selected Economic Essays and Addresses.* London: Routledge & Kegan Paul.

Posner, R. A. (2005) Hayek, law, and cognition. *NYU Journal of Law & Liberty* 1:147-65.

Rochet, J.-C. and Tirole, J. (2003). Platform competition in two-sided markets. *Journal of the European Economic Association*, 1(4): 990–1029.

Rothbard, M. (1970) *Power and Market.* Menlo Park, CA: Institute of Humane Studies.

Schrepel, T. (2014) Frederich Hayek's contribution to antitrust law and its modern application. *ICC Global Antitrust Review*, https://ssrn.com/abstract=2548420, 199–216.

Schumpeter, J. A. (1942) *Capitalism, Socialism, and Democracy*. London: George Allen and Unwin.

Shenfield, A. (1983) *Myth and Reality in Antitrust*, Occasional Paper No. 66. London: Institute of Economic Affairs.

Simon, H. (1957) *Models of Man*, New York: Wiley.

Smith, A. (1776) *An Inquiry into the Nature and Causes of the Wealth of Nations.*

Smith, V. (1982) Markets economizing on information: Experimental examination of the Hayek Hypothesis. *Economic Inquiry* 20: 261–74.

Stigler, G. J. (1964) A Theory of Oligopoly. *Journal of Political Economy* 72: 44–61.

Stigler Center Report (2019) *Stigler Committee on Digital Platforms – Final Report*. George Stigler Center. Chicago: University of Chicago.

Taylor, F. M. (1929) The guidance of production in a socialist state. *American Economic Review* 19(1): 1–8.

Teece, D. J (2021) Towards a dynamic competition approach to big tech merger enforcement: the Facebook Giphy example. *TechREG Chronicle* 1: 49–61.

Thomsen, E.F. (1992) *Prices and Knowledge – A Market-Process Perspective*. London: Routledge.

Trebilcock, M. J. (1986) *The Common Law of Restraint of Trade – A Legal and Economic Analysis*. Toronto: Carswell.

Veljanovski, C. (2009) The common law and wealth. In *The Legal Foundations of the Market* (ed. S. Copp) London: Institute of Economic Affairs.

Veljanovski, C. (ed.) (2015) *Forever Contemporary – The Economics of Ronald Coase*. London: Institute of Economic Affairs.

Veljanovski, C. (2021) 'Hayek on competition and antitrust in a digital age. In *The Meaning of Competition in a Digital Age.* (ed. V. Hewson) London: Institute of Economic Affairs. https://iea.org.uk/publications/the-meaning-of-competition-in-the-digital-age/

Veljanovski, C. (2022a) The competition economics of online platforms. *Singapore Economic Review* 67(5): 1,699-724.

Veljanovski, C. (2022b) Algorithmic antitrust – A critical overview. In *Algorithmic Antitrust* (ed. A. Portuese) Berlin: Springer.

Veljanovski, C. (2022c) What do we now know about 'machine collusion'. *Journal of European Competition Law & Practice.* 13(1): 47–50.

Veljanovski, C. (2022d) Pricing algorithmes as collusive devices. *International Review of Intellectuel Property & Competition Law.* 15(2) : 604-22.

Wang, B. and Li, X (2017) Big data, platform economy and market competition: A preliminary construction of plan-oriented market economy system in the information era. *World Review of Political Economy* 8(2): 138–61.

Williamson, O. E. (1985) *The Economic Institutions of Capitalism.* New York: Free Press.

Wu, T. (2018) *The Curse of Bigness: How Corporate Giants Came to Rule the World*. New York: Columbia Global Reports.

The Institute of Economic Affairs
2 Lord North Street
London SW1P 3LB
Tel 020 7799 8900
email iea@iea.org.uk

iea
Institute of
Economic Affairs