

Towards a Theory of Market Power

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By MARK JAMISON *

This paper analyzes the question of market power. Longstanding definitions and analytical tools are inadequate because they conflate conditions under which a firm has unbeneficial control over its markets (market power) with situations where firms are successful because they are superior in how they serve customers (expanding consumer welfare). Furthermore today's fast-changing markets make current antitrust approaches invalid because the information decays as circumstances rapidly change. This paper develops a more rigorous definition of market power and proposes new tests. The proposed definition seeks to isolate damaging market control and the tests examine the extent to which investors, actual rivals, and potential rivals act as if market power is present.

Keywords: Market power, antitrust, competition, monopoly

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Economists and government officials have long been interested in issues of market power. Since Cournot's original work on oligopoly economists have considered a firm to have market power if it can influence its price by determining output.¹ In his seminal analysis in 1934, Lerner explains that a firm with market power would price above marginal cost and receive economic rents to the harm of consumers in the form of what economists call deadweight loss.² Others, such as Fisher, Landes and Posner, Schmalensee, and Hay refine Lerner's work and develop additional indicators of market power.³ Government concerns with market power launched the antitrust movement in the US. Louis Brandeis was an early leader and viewed market power through a political lens, arguing that large firms are generally unnatural and harmful, not just to an economy, but also to a country's political system.⁴ The economic view and political view of market power have important differences,⁵ but at their heart, these views seek to identify firms that are able to benefit from limiting others' choices.

This paper extends these inquiries by showing that the indicators of market power identified in the literature systematically provide miscues about whether a firm has command of its market. A firm might have the features Lerner and others identify, including receiving "monopoly profits," and yet have no market power because the apparent strictly positive rents simply offset periods of time, such as startup phases, when the firm receives negative profits. But even if the firm receives economic rents over its lifetime, these rents serve a necessary function in a dynamic sector in

¹ See ANTOINE COURNOT, RESEARCHES INTO THE MATHEMATICAL PRINCIPLES OF THE THEORY OF WEALTH (Trans. N.T. Bacon Macmillan 1929) (1838).

² See Abba P. Lerner, *The Concept of Monopoly and the Measurement of Monopoly Power*, 1 REV. ECON. STUD. 157, 157-165 (1934). Deadweight loss refers to the lost value of economic activity that does not occur because the firm limits output.

³ See Franklin M. Fisher, *Diagnosing Monopoly*, 19 Q. REV. ECON. & BUS. 7 (1979); William M. Landes and Richard A. Posner, *Market Power in Antitrust Cases*, 94 HARV. L. REV. 937 (1981); Richard Schmalensee, *Another Look at Market Power*, 95 HARV. L. REV. 1789 (1982); and George A. Hay, *Market Power in Antitrust*, 60 ANTITRUST L. J. 807 (1992).

⁴ See THOMAS K. MCCRAW, PROPHETS OF REGULATION 339 (1984).

⁵ RICHARD L. GORDON, ANTITRUST ABUSE IN THE NEW ECONOMY 27 (2002).

that they help ensure that investors are willing to risk economic losses from financing firms that ultimately fail. Absent economic rents by successful firms, investors would on average receive negative profits and cease to provide capital to a sector.

This capital-attracting role of economic rents provides an avenue for determining whether a firm has market power.⁶ If a firm's economic rents fail to attract capital to actual or potential rivals, then it would appear that investors view the firm as having an unassailable position. We provide three possible reasons. One is that the firm has developed capabilities that others believe they cannot match. In such cases the firm has added value to the economy in developing these capabilities and should not be viewed as having market power in the sense of damaging others. Another possibility is that the sector is ripe for an episodic disruption, which might lead investors to believe that firm's current product will be short lived and so investing to compete is unlikely to be profitable. Finally, the firm's protected position might result from an endowment by government or an endowment by nature that the firm has not earned. In these instances, the firm should be considered to have market power and antitrust enforcement could be welfare enhancing. In short, a firm has market power if it is protected by an unearned endowment that causes the firm's profits to attract capital to that firm alone and not to other entities since none can compete for those profits.

Traditionally there are two basic approaches for considering market power and the purpose of antitrust. One approach is economic and defines market power in the Cournot tradition.⁷ It applies antitrust when a firm uses market power to harm

⁶ The importance of prospective monopoly profits to the incentive to innovate was first explored by JOSEPH A. SCHUMPETER, *CAPITALISM, SOCIALISM, AND DEMOCRACY* (1950). Our analysis differs in three ways. First, we examine rivalry for providing net consumer surplus rather than specific products. Second, we address how existing firms' profits affect expectations of monopoly rents. Finally, we develop instruments that use these concepts to assess market power.

⁷ Gordon *supra* note 5, at 16-21.

consumers.⁸ This view is often attributed to The Chicago School, but doing so is somewhat misplaced as some of its perspectives can also be found in Smith and Lerner, both predating involvement of economists from the University of Chicago.⁹ Several other schools of thought, such as the Post-Chicago school, the Neo-Chicago school, and the Behavioral School largely hold the same definition of market power, but differ in what they find as objectional firm behavior.¹⁰

The other approach is more populist and claims to find its roots in Louis Brandeis.¹¹ It holds that large firms inherently harm the economy and democracy.¹² This school has populist appeal, but has several weaknesses from a scholarly perspective.¹³ It equates large with market power,¹⁴ which has been refuted in the literature.¹⁵ Also, it provides little guidance on what is meant by “large” and the harms it purports are vague. This haziness allows potentially undesirable political and regulatory discretion.¹⁶ Regulators could pick and choose whom to prosecute, causing economic and political distortions, and ultimately making antitrust a greater instrument of rent seeking.¹⁷ Unclear theories of harm lead to costly prosecutions that decrease beneficial rivalry and innovation, and to unresolved cases.¹⁸

⁸ Timothy J. Muris and Jonathan E. Nuechterlein, *Antitrust in the Internet Era: The Legacy of United States v. A&P*, 54 REV. IND. ORG. 651, 654 (2019).

⁹ See ADAM SMITH, *THE WEALTH OF NATIONS* (Modern Library Edition 1937) (1776), and Lerner *supra* note 2.

¹⁰ See Max Huffman, *Marrying Neo-Chicago with Behavioral Antitrust* 78 ANTITRUST L. J. 105 (2012).

¹¹ Lina Khan *The New Brandeis Movement: America’s Antimonopoly Debate* 9 J. OF EURO. COMP. L. 131, 132 (2018). See also TIM WU, *THE CURSE OF BIGNESS: ANTITRUST IN THE NEW GILDED AGE* (2018).

¹² Khan *supra* note 11, at 131.

¹³ Muris and Nuechterlein *supra* note 8, at 653.

¹⁴ See Wu *supra* note 11.

¹⁵ Fisher *supra* note 3, at 17-23.

¹⁶ Ronald A. Cass, *Antitrust for High-Tech and Low: Regulation, Innovation, and Risk* 9 J. L., ECON. & POL’Y 169, 175-177 (2013).

¹⁷ *Ibid.*

¹⁸ *Ibid.*

This paper builds on the economic view, drawing upon the work of two founders of modern economics -- Smith and Mill – who focus on why and how businesses are protected from competition, whether by government or nature.¹⁹ Writing about the time of Mill, Cournot provides the first analytical model of pricing with limited competition,²⁰ but the monopoly aspect of his work remained largely unexplored until Lerner developed definitions of monopoly and monopoly power.²¹ He stated that a monopoly can set its price, subject to consumer demand, implying a falling demand curve.²² He measured the degree of monopoly power with what has become known as the Lerner index.²³

Subsequent work by Fisher,²⁴ Landes and Posner,²⁵ and Schmalensee²⁶ examine the application of monopoly power in antitrust cases and refine Lerner's analysis. They explain that the ability to exclude competition is key to having market power²⁷ and conclude that market share can be misleading as an indicator of market power.²⁸ They also develop foundations for defining market boundaries by exploring product substitutability.²⁹ Hay adds that a firm might face a downward sloping demand curve, but not receive economic profits.³⁰ But economists' analytical models largely assume market power rather than explain or explore it.

¹⁹ See Smith *supra* note 9, and JOHN STUART MILL, PRINCIPLES OF POLITICAL ECONOMY (1848).

²⁰ See Cournot *supra* note 1.

²¹ See Lerner *supra* note 3.

²² Lerner *supra* note 2, at 157.

²³ *Ibid* at 169.

²⁴ See Fisher *supra* note 3.

²⁵ Landes and Posner *supra* note 3.

²⁶ See Schmalensee *supra* note 3.

²⁷ Fisher *supra* note 3, at 12.

²⁸ Fisher *supra* note 3, at 17-23.

²⁹ Landes and Posner *supra* note 3, at 960-972.

³⁰ Hay *supra* note 3, at 813.

The question of properly defining market power is rising in importance. Recent studies have examined purported increasing corporate profits, growing firm size, and rising Lerner indices to conclude that market power is increasing around the world and that greater antitrust enforcement is needed. Furman and Orszag find an increasing fraction of firms in the US obtaining apparently high profits and speculate that this might be due to increasing market shares.³¹ Grullon et al. find that the Herfindahl-Hirschman Indices of publicly listed firms increased at the same time that average firm size rose.³² Autor et al. examine the emergence of “Superstar” firms and conclude that they decrease labor’s share of national income.³³ Shapiro and Ganapati refute these studies by pointing out flaws in their measurements and in how they define markets.³⁴ Nevertheless, the view that market power is rising and that antitrust should aggressively respond has been embraced by persons in such prominent organizations as the International Monetary Fund and the Organisation for Economic Co-operation and Development,³⁵ and is given credence in the news media and by many politicians.³⁶

But these views of market power are largely static and their application is problematic because digitization is enabling firms and markets to change more

³¹ See Jason Furman, Diane Coyle, Amelia Fletcher, Derek McAuley, and Philip Marsden, *Unlocking Digital Competition: Report of the Digital Competition Expert Panel* (UK Government Publications, 2019), https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/785547/unlocking_digital_competition_furman_review_web.pdf.

³² See Gustavo Grullon, Yelena Larkin and Roni Michaely, *Are US Industries Becoming More Concentrated?* 23 REV. FIN. 697.

³³ See David Autor, David Dorn, Lawrence F. Katz, Christina Patterson & John Van Reenen, *Concentrating on the Fall of the Labor Share* 107 AM. ECON. REV. 180 (2017); and David Autor, David Dorn, Lawrence F. Katz, Christina Patterson & John Van Reenen, *The Fall of the Labor Share and the Rise of Superstar Firms*,” NBER Working Paper No. 23396.

³⁴ See Carl Shapiro, *Antitrust in a time of populism* 61 INT’L J. IND. ORG. 714 (2018); and Sharat Ganapati, *Oligopolies, Prices, Output, and Productivity* (Working paper Georgetown University, 2018) https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3030966.

³⁵ See Federico J. Diez, Daniel Leigh, and Suchanan Tambunlertchai, *Global Market Power and its Macroeconomic Implications*, (International Monetary Fund, 2018); and Organisation for Economic Co-operation and Development, *Market Concentration* (2018).

³⁶ Khan *supra* note 11, at 131.

rapidly than in the past.³⁷ The empirical economic studies view firms over only a few years and when firms appear successful, ignoring times during which they lose money.³⁸ Studies used in antitrust enforcement share this deficiency.³⁹ In antitrust a firm is observed when it is near the pinnacle of its financial performance.⁴⁰ The antitrust regulators use these periods to examine product substitutability, Lerner indices, and profits.⁴¹ If the firm is determined by these indicators to have market power, then the regulators examine whether its conduct during this period could be viewed as harming consumers.⁴²

This static approach misses important context. Even without the dynamics of digitization, firms experience periods of time during which their economic profits are negative.⁴³ Investors need to expect that there will be times of positive economic profits, or they won't fund development and growth. Furthermore, conduct that would appear in a static context to harm consumers may in actuality benefit consumers by attracting capital to fund new firms and further innovation.⁴⁴

This paper addresses this gap in the literature by taking a more dynamic view of firm profits and, by extension, market power. It describes how actual and potential firms learn from experiences about economic contexts and about regulation to form expectations about profitability and the performance of antitrust. Favorable conditions are consistent with higher profit expectations, which encourage business formation and expansion. A firm might have market power if its profitability does not enhance the profit expectations of would-be rivals or of complementors because

³⁷ See Section I.

³⁸ Fisher *supra* note 3, at 10.

³⁹ *Ibid.*

⁴⁰ *Ibid.*

⁴¹ See Jonathan B. Baker, *Market Definition: An Analytical Overview* 74 ANTITRUST L. J. 129, 132-34 (2007).

⁴² *Ibid.* at 130-31.

⁴³ Fisher *supra* note 3, at 10.

⁴⁴ See Section II.

the firm is able to extract and protect all economic rents. If the barriers that make this firm's profits uninteresting to rivals is unearned – perhaps a gift of government or of nature – then the firm should be considered to have market power and antitrust authorities should address the barriers. If barriers are earned in that the firm has developed unassailable capabilities or developed the gift of nature, or if the barriers are short lived because current business ecosystems have run their course, then the firm should not be considered to have market power.

This paper proceeds as follows. Section I provides a literature review and examines the properties of digitization that frustrate traditional approaches to antitrust. Section II describes a new way to consider market power that addresses the challenges of digitization. Section III examines the implications for antitrust. Section IV is the conclusion. The appendix provides a more technical analysis.

I. The Literature

This section first examines how market power is defined in the literature and in practice. It then explores the challenges that growing market digitization presents to traditional notions of market power and to antitrust practices. It closes with a review of solutions that have been proposed to address these challenges.

A. Concepts of Market Power

Lerner provides seminal work on the meaning of market power.⁴⁵ Focusing on monopoly and monopoly power, he contrasts monopoly with a firm whose conduct has no impact on market price.⁴⁶ The monopoly can set its price, subject to consumer demand, implying a falling demand curve.⁴⁷ The social cost to monopoly

⁴⁵ See Lerner *supra* note 2.

⁴⁶ *Ibid* at 157.

⁴⁷ *Ibid* at 157.

is the deadweight loss, i.e., the difference between consumers' willingness to pay for production that does not occur because the monopolist restricts output, and the production costs that would have been incurred.⁴⁸ He measures the degree of monopoly power with what has become known as the Lerner index:⁴⁹

$$\frac{P - MC}{P}$$

where P is the market price and MC is the marginal production cost. With an upper bound of one, a higher index value indicates greater market power than a lower index. In the perfect competition model, the index is zero.

Fisher explores indicators of market power and shows that the ability to exclude competition is key.⁵⁰ Landes and Posner examine the application of monopoly power in antitrust cases.⁵¹ They analyze the features of the Lerner index and conclude that market share can be a misleading indicator of market power.⁵² They also develop the foundations for defining market boundaries by exploring substitutability of products and the geographic limits of consumers' abilities to obtain substitute products.⁵³

Schmalensee adds to Landes and Posner by explaining the difference between short run and long run analysis and the complexities of defining markets with differentiated products. He also identifies indicators of market power, including persistently high profits and certain forms of conduct, such as predation.⁵⁴

⁴⁸ *Ibid* at 157-165.

⁴⁹ *Ibid* at 169.

⁵⁰ See Fisher *supra* note 3.

⁵¹ See Landes and Posner *supra* note 3.

⁵² *Ibid* at 941-43.

⁵³ *Ibid* at 947-48, 963-65.

⁵⁴ See Schmalensee *supra* note 3.

Hay explains that in antitrust, market power and consumer harm are separate questions.⁵⁵ A firm might have market power in the sense of facing a downward sloping demand curve and pricing above marginal cost, but it might not receive economic profits. It also might not harm consumers in the sense of restricting competition or creating deadweight loss.⁵⁶

Antitrust today embraces these basic ideas. It focuses on finding market power and then, if it is found, determines whether its use harms consumers.⁵⁷ European Union regulators identify market power by examining market shares and also by considering harms to competitors.⁵⁸ US regulators focus on consumers and apply the Lerner index, downward sloping demand, barriers to entry, and abnormally high profits during the time that a firm is successful. Generally antitrust regulators define product and geographic market boundaries as an initial step in their analysis,⁵⁹ but this is an unnecessary step for US regulators.⁶⁰

The next subsection discusses features of digital markets that create challenges for traditional market power analyses. It is not a comprehensive description of digital markets.

B. Challenges of Digitization

Constant change. — In practice antitrust considers a firm during a narrow slice of time, effectively assuming that what came before and what comes after are of little consequence.⁶¹ This is not the nature of digitized sectors, where disruption

⁵⁵ See Hay *supra* note 3, at 811-812.

⁵⁶ *Ibid* at 814-16.

⁵⁷ Baker *supra* note 41, at 131.

⁵⁸ European Commission *Competition* https://ec.europa.eu/competition/antitrust/procedures_102_en.html.

⁵⁹ Baker *supra* note 41, at 133.

⁶⁰ Michael L. Katz and Howard A. Shelanski, *Mergers and Innovation* 74 ANTITRUST L. J. 1 (2007).

⁶¹ *Ibid* at 12-13; Cass *supra* note 16, at 193-95.

happens quickly and episodically.⁶² Bell explains that such change happens because a new computer class forms roughly each decade.⁶³ Existing firms and startups compete intensely for these breakthrough innovations.⁶⁴ But as a matter of industry disruption the precise timing and strength are unpredictable, and the disruption can either enhance an industry leader's core competency or destroy its value,⁶⁵ causing a once highly successful firm – and one perhaps viewed as having market power – to play at best a minor role going forward. This challenges the notion of enduring market power as defined by Lerner.⁶⁶ If temporary successes constitute market power, market evolution would resolve deadweight loss before the government would act and, when the government did act, it would be affecting a market that did not need intervention.

This conflict between the static views of market power and antitrust, and the dynamics of quickly evolving industries has caused problems in at least two high profile antitrust cases. In 1969 the US Department of Justice filed an antitrust case against IBM, accusing it of illegally monopolizing computers⁶⁷ IBM was enjoying impressive success in the computer business at the time the case was filed, but the market was changing. The evolution became so substantial that government gave up the case, admitting that it was without merit.⁶⁸ Similarly in the Microsoft case filed in 2000, the government missed how computer operating systems were evolving and as a result lost substantial portions of its case.⁶⁹

⁶² David J. Teece & M. Coleman, *The Meaning of Monopoly: Antitrust Analysis in High-Technology Industries* 43 ANTITRUST BULL. 801, 804 (1998).

⁶³ Gordon Bell, *Bell's Law for the Birth and Death of Computer Classes: A Theory of the Computer's Evolution*, TECH. REP. MSR-TR-2007-146 <https://www.microsoft.com/en-us/research/wp-content/uploads/2007/11/tr-2007-146.pdf> (2019).

⁶⁴ Cass *supra* note 16, at 194-96.

⁶⁵ Teece and Coleman, *supra* note 62, at 808-09

⁶⁶ See Lerner *supra* note 2.

⁶⁷ Cass *supra* note 16, at 178-79.

⁶⁸ Cass *supra* note 16, at 180-81.

⁶⁹ Cass *supra* note 16, at 184-85.

The present response of scholars and regulators to the conflict between static tools and a dynamic industry is to project industry trends. Ginsburg and Wright identify situations of forward looking analysis of monopoly pricing, attempted monopolization, predatory pricing and recoupment, and exclusive dealing.⁷⁰ Katz and Shelanski hold that antitrust should predict technological change and offer techniques.⁷¹ Gilbert and Sunshine argue that regulators should consider how post-merger vs. pre-merger market structure change affects innovation, although there is substantial literature showing that the connection between market structure and innovation is tenuous at best.⁷²

Unfortunately for the projection approach to addressing industry change, government cannot predict industry evolution well.⁷³ If it could, then businesses could also predict the change and it would not be disruptive. This inability to predict thwarts regulators' abilities to clearly identify market power and investigate its underlying causes.⁷⁴

In failing to adequately recognize industry change, antitrust too often simply hobbles the winner of a round of episodic disruption, making it hard for the accused to leverage its capabilities to bring value in the next disruptive phase.⁷⁵ The antitrust case against IBM cost the company about \$1 billion at the time, which would be between \$4.7 billion and \$5.8 billion in 2019.⁷⁶ The cost and the distraction may have limited IBM's ability to be a more significant contributor to the evolution of

⁷⁰ See Douglas H. Ginsburg & Joshua D. Wright, *Dynamic Analysis and the Limits of Antitrust Institutions* 78 ANTITRUST L. J. 12 (2012).

⁷¹ Katz and Shelanski *supra* note 60, at 12-13.

⁷² Richard J. Gilbert & Steven C. Sunshine, *Incorporating Dynamic Efficiency Concerns in Merger Analysis: The Use of Innovation Markets* 63 ANTITRUST L. J. 569, 569-70, 574-76 (1995).

⁷³ Cass *supra* note 16, at 193-95.

⁷⁴ *Id.*

⁷⁵ Teece & Coleman, *supra* note 62, at 809.

⁷⁶ Cass *supra* note 16, at 180.

personal computers.⁷⁷ This hobbling of a company signals to those firms competing for the next disruptive phase that the winner's success will be limited. This limits the competitors' interests in risk taking and investment.⁷⁸

Profits. — To some observers, profits of information technology leaders appear substantial, are indicators of market power, and are a cause for concern: Galloway states that “Apple, Amazon, Facebook, and Google ... have generated unprecedented wealth (\$2.3 trillion) . . .” and use the profits to manipulate governments and competitors to steal intellectual property.⁷⁹

But there are problems with this reasoning. Profits are hard to measure well,⁸⁰ and monopoly profits are even harder to identify. Even before the dynamic changes of digitization, Demsetz observes that superior profitability may simply mean superior efficiency, and should be applauded rather than trigger investigations.⁸¹ Teece and Coleman identify three kinds of economic rents: Scarcity (Ricardian), Shumpeterian (product innovation), and monopoly.⁸² Scarcity rents occur when resources are in short supply and the profits are needed to incentivize firms to overcome shortages.⁸³ Shumpeterian rents occur when rivals have not yet matched the surplus that the leading firm provides to consumers. Monopoly rent lacks justification and results from exclusionary conduct, predatory conduct, or government-conferred privilege. Thus, a more meaningful approach than researching economic rents is to ask whether customers are paying a price above

⁷⁷ *Id.* at 180-81.

⁷⁸ Teece & Coleman, *supra* note 62, at 839.

⁷⁹ SCOTT GALLOWAY, HIDDEN DNA OF AMAZON, APPLE, FACEBOOK, AND GOOGLE, at 1 (2017).

⁸⁰ Shapiro *supra* note 34, at 732-33.

⁸¹ See Harold Demsetz, *Two Systems of Belief About Monopoly*, in INDUSTRIAL CONCENTRATION: THE NEW LEARNING (Harvey J. Goldschmid, H. Michael Mann, & J. Fred Weston eds., 1974).

⁸² Teece & Coleman, *supra* note 62.

⁸³ Newman, *infra* note 88, (argues that consumer attention is such a limiting resource, but believes that its shortage will not attract investment into solutions).

what is needed to incentivize the products and services they desire over time. In other words, is the firm shielded from entry?⁸⁴

Network Effects. — Network effects have been present in several industries historically but are particularly pronounced in many digital markets. When accompanied by high fixed costs relative to marginal production costs, network effects can result in winner-take-most markets.⁸⁵ This tendency has found its way into antitrust-oriented scholarly work. When studying intergenerational network effects, Crémer, Rey, and Tirole examine market power in the Internet backbone and conclude that embedded customer bases are a source of power that leads to discrimination.⁸⁶ Similarly, Carlton and Waldman examine generations of software and conclude that an embedded customer base provides a software provider with a competitive advantage that can lead to market power.⁸⁷ Both papers omit from their analysis how or why a particular firm might build customer bases and the impacts on customers if the firm chose to not do so.

Cass explains that network effects can cut both ways.⁸⁸ They may help an incumbent to retain customers and innovate into the next generation of products if the effects the firm has created provide greater net consumer surplus than what is offered by rivals. The reverse may happen: A firm (not the incumbent) providing what might appear to be a product in another market may create network effects that better position it for next generation products. For example, Facebook's and

⁸⁴ Teece & Coleman, *supra* note 62.

⁸⁵ HAL R. VARIAN, JOSEPH FARRELL, & CARL SHAPIRO, *THE ECONOMICS OF INFORMATION TECHNOLOGY: AN INTRODUCTION* (2004).

⁸⁶ Jacques Crémer, Patrick Rey, & Jean Tirole, *Connectivity in the Commercial Internet*, 48(4) J. INDUS. ECON. 433 (2000).

⁸⁷ Dennis W. Carlton & Michael Waldman, *The Strategic Use of Tying to Preserve and Create Market Power in Evolving Industries*, 33(2) RAND J. ECON. 194 (2002).

⁸⁸ Cass, *supra* note 16.

Amazon's network effects each provide a different form of advantage for next generation online retail. Facebook's network effects are from its users and advertisers using a largely communications platform. Amazon's are from its supplier base and its customers that have developed norms of purchasing using Amazon.

Market Share. — Casual observers and adherents to the neo-Brandeis school tend to view market shares of successful digital firms to be shockingly high and indicators of market power. Consider this description by Newman explaining why digital leaders have “enduring market power”:

“Many digital markets exhibit highly concentrated structures, with a single dominant firm possessing a massive share. Various industry sources have identified Google, for example, as owning between 91% and 97% of the ‘search’ or ‘search engine’ market. In 2017, Amazon captured 83% of e-book sales, and 44% of all e-commerce sales, in the United States. As of February 2018, Facebook, Instagram, and Messenger represented the three largest (in terms of users) mobile social-networking apps in the United States. All three are controlled by the same firm: Facebook, Inc. Facebook’s dominance extends to the advertiser side of its social-networking platforms, where it has consistently held a market share of more than 70%. Even global geographic markets are susceptible to surprisingly high concentration levels: by 2016, for example, Google’s Android had captured 87.5% of the worldwide market for smartphone operating systems.”⁸⁹ (footnotes omitted)

⁸⁹ John M. Newman, *Antitrust in Digital Markets*, 72 VAND. L. REV. 1497, 1503-04 (2019).

Newman’s objective evidence of enduring market power is nothing more than shares of loosely defined markets, and he augments this “evidence” with characterizations, such as “massive,” “owning,” and “controlled.”

The use of market share as conclusive evidence of market power persists despite the numerous explanations by economists that the former does not indicate the latter and that leaders in winner-take-most markets always have high market shares.⁹⁰

Dynamics and Firm Survival. — Dynamics and firm survival patterns of digital markets derive in part from their network effects, constant change, and winner-take-most characteristics. The dynamics include technology paths, development of competencies, and competition for the next episode in innovation. Sidak and Teece (2009) explain:

“New technologies can enhance or destroy a firm’s competency. The essence of the dynamic competition approach is that technological change itself shapes industry structure. Also, path dependencies and dynamic increasing returns may exist. Put differently, the rate and direction of innovation at the level of the firm do not depend on market structure but on the firm’s competencies, the internal and external knowledge upon which the firm can draw, the intellectual property regime, and the firm’s complementary assets. Entry conditions are a function of appropriability and ‘cumulativeness.’ Learning and innovation will also shape the firm’s boundaries.”⁹¹

These dynamics frustrate traditional antitrust and market power analyses, which tend to view firms as essentially indistinguishable and interchangeable except for their present market shares, technical efficiency, and products. The equal access

⁹⁰ See Landes & Posner, *supra* note 3; Katz & Shelanski, *supra* note 60; Shapiro, *supra* note 34, (2018); Varian et al., *supra* note 85.

⁹¹ Gregory Sidak & David Teece, *Dynamic Competition in Antitrust Law*, 5(4) J. COMPETITION L. ECON. 581, 612 (2009).

requirements in the breakup of AT&T presumed that MCI and Sprint could be just like, or nearly like, AT&T, absent the head start and relationship that AT&T had with its pre-divestiture local telephone subsidiaries.⁹²

Penrose was one of the first to explain core differences between firms.⁹³ She defines a firm not by its current products, but by its capabilities and resources, particularly those of management experience. North describes these capabilities to include beliefs and norms that exist within the individuals in a firm and between them, i.e., in the formal and information aspects of their relationships.⁹⁴ Penrose explains that gaining experience naturally leads a firm to expand, but market shares do not measure how well a firm is positioned to compete.⁹⁵ Sidak and Teece add that “other assets—such as innovation capabilities—define the firm’s resources or capabilities” and that capabilities are more stable than products.⁹⁶ In this view a merger constitutes a change in a firm’s capabilities, affecting the innovation’s trajectory and who participates in a market.⁹⁷

Digital market leaders often leverage their capabilities by buying other firms whose products the purchasing firm believes it can make more successful. For example, Instagram and WhatsApp both appear to have grown in their profitability after being acquired by Facebook. Wen and Zhu find that when successful digital firms such as Google vertically integrate into an app space, less successful firms

⁹² Cass, *supra* note 16, 189-90.

⁹³ EDITH PENROSE, *THE THEORY OF THE GROWTH OF THE FIRM* (1959).

⁹⁴ DOUGLASS C. NORTH, *INSTITUTIONS, INSTITUTIONAL CHANGE, AND ECONOMIC PERFORMANCE* (1990).

⁹⁵ Penrose, *supra* note 93.

⁹⁶ Sidak & Teece, *supra* note 91, at 616.

⁹⁷ Katz & Shelanski, *supra* note 60, at 16-17; DENNIS C. CAREY & DAYTON OGDEN, *THE HUMAN SIDE OF M&A: HOW CEOs LEVERAGE THE MOST IMPORTANT ASSET IN DEAL MAKING* (2004).

limit their entry into that space.⁹⁸ Newman views this as evidence of Google having market power and thus presenting an antitrust problem.⁹⁹ But a more considered analysis could conclude that the potential rivals believe that in this instance the market leader possesses capabilities that the rivals do not, and that these capabilities will lead to that firm greater success in the app market. Another possibility is that recent regulations make small businesses less efficient than large businesses.¹⁰⁰

The importance of capabilities in defining firm success – especially intertemporal success – frustrates traditional antitrust views, which focus on products. As Cass explains, a firm’s current success invites rival investment at the initial innovation, follow-on improvements, and the next episodic disruption.¹⁰¹ Teece explains that these improvements generally involve numbers of innovations, so that success results from the right combination of innovations, at the right time, and in a firm with the right capabilities.¹⁰² Filson et al. observe this in mergers that affect other firms’ profits: If a merger has a positive (conversely, negative) impact on rivals’ cumulative abnormal returns, then the merged firm increases (conversely, decreases) its research and development.¹⁰³ They hold that research and development has more significant consumer welfare impacts than price changes.

⁹⁸ W. Wen & F. Zhu, *Threat of Platform-owner Entry and Complementor Responses: Evidence from the Mobile App Market*, 40(9) STRATEGIC MGMT. J.1336 (2019).

⁹⁹ Newman, *supra* note 89, at 1509-11.

¹⁰⁰ Hester Peirce, Ian Robinson, & Thomas Stratmann, *How Are Small Banks Faring Under Dodd-Frank?* (GMU Working Paper in Economics No. 14-49., 2014); Michael D. Bordo & John V. Duca. *The Impact of the Dodd-Frank Act on Small Business*, CATO RESEARCH INSTITUTE, Research Briefs in Economic Policy No. 129 (Sept. 5, 2018), <https://www.cato.org/publications/research-briefs-economic-policy/impact-dodd-frank-act-small-business>; Jia Jian, Ginger Zhe Jin, & Liad Wagman, *The Short-Run Effects of GDPR on Technology Venture Investment*, available at <https://ssrn.com/abstract=3278912> (last visited Dec. 28, 2019).

¹⁰¹ Cass, *supra* note 16, at 176.

¹⁰² David J. Teece, *Next-Generation Competition: New Concepts for Understanding How Innovation Shapes Competition and Policy in the Digital Economy*, 9(1) J. OF L., ECON. & POL’Y 97, 102 (2012).

¹⁰³ Darren Filson, Saman Olfati, & Fatos Radoniqi, *Evaluating Mergers in the Presence of Dynamic Competition Using Impacts on Rivals*, 58(4) THE J. OF L. & ECON. 915, 929-30 (2015).

If firm capabilities are the primary determinants of firm success, it is hard to view high capabilities as problematic creators of market power. It would seem that antitrust regulators, in looking for market power, would need to look beyond success into underlying reasons and limit their actions to situations where success is high, but not driven by superior capabilities.

Business Ecosystem. — Firms in digital markets are generally part of a business ecosystem and compete with others within that system.¹⁰⁴ This would be true for apps in the Google Play Store, for example, where similar apps compete for an Android phone user's business. But there is also rivalry between business ecosystems: The Apple operating system, iOS, competes with the Android operating system and with Windows.

This complicates defining market power. A function such as search provided by Google may appear to have market power within an internet browser ecosystem, but its success depends upon the browser ecosystem competing with specialized apps.

Firm Failure. — Firms' inability to develop appropriate capabilities at the right time sometimes lead to acquisition, but at other times lead to business failure.

Firms are most at risk for failure during their first seven years, but failure occurs later as well.¹⁰⁵ The literature identifies four types of business failure. One type is the unsuccessful startup that fails because the creators have the skills to develop a product idea, but not those necessary to produce and market the product. Signals that a startup may be of this type include heavy capital expenditures, low sales

¹⁰⁴ Teece, *supra* note 102; Jeffrey Eisenach, *Broadband Competition in the Internet Ecosystem*, AMERICAN ENTERPRISE INSTITUTE, (Oct. 18, 2012), <https://www.aei.org/research-products/journal-publication/broadband-competition-in-the-internet-ecosystem/>; Jeffrey A. Eisenach, *US Merger Enforcement in the Information Technology Sector*, in THE CAMBRIDGE HANDBOOK OF ANTITRUST, INTELLECTUAL PROPERTY, AND HIGH TECH 445 (Roger Blair and Daniel Sokol eds., 2017).

¹⁰⁵ Edward I. Altman, Malgorzata Iwanicz-Drozdzowska, Erkki K. Laitinen, & Arto Suvas, *Financial and Non-Financial Variables as Long-Horizon Predictors of Bankruptcy*, 12(4) J. CREDIT RISK 49 (2016).

levels, and underestimated expenses, followed by low cash flow, low profitability, and poor liquidity.¹⁰⁶

The second type of failure is a startup that is overly ambitious in its beliefs about growth, despite the managers possessing appropriate business experience. The signals include overestimation of demand, inability to refinance once weak demand is realized, weak liquidity, and weak solvency.¹⁰⁷

A third type of failure is that of a more mature firm whose rapid growth “dazzles” management into not changing the business structure to achieve efficiency as the firm grows. The signals include lack of restructuring as growth occurs, and investment and expenses growing in step with sales.¹⁰⁸

The fourth type of failure is that of an apparently apathetic established firm whose management fails to notice or adapt to changes in the business environment. The enterprise focuses on current markets and products, causing it to initially not see changing demand, then not recognizing the nature of the threat, and finally failing to adapt.¹⁰⁹ An example of this might be traditional media companies (print and electronic) whose customer bases and revenues began declining in the 1990s. Many did not begin reforming business models when the declines began and now blame digital leaders such as Facebook even though their decay predates Facebook.

Current antitrust practices do not study firm failure, except to consider whether one firm’s success has precipitated another firm’s decline. Regulators appear unaware of how their actions that limit successful firms’ profits might discourage

¹⁰⁶H. Ooghe & S. De Prijcker, *Failure Processes and Causes of Company Bankruptcy: A Typology*, 46(2) MGMT DECISION 223 (2008); J. ARGENTI, CORPORATE COLLAPSE: THE CAUSES AND SYMPTOMS (1976).

¹⁰⁷Ooghe & De Prijcker, *supra* note 106; Argenti, *supra* note 106.

¹⁰⁸Ooghe & De Prijcker, *supra* note 106; Argenti, *supra* note 106.

¹⁰⁹Ooghe & De Prijcker, *supra* note 106; Argenti, *supra* note 106; Jaroslaw Ropega, *The Reasons and Symptoms of Failure in SME*, 17(4) INTERNATIONAL ADVANCES IN ECONOMIC RESEARCH 476 (2011); DOUGLASS C. NORTH, UNDERSTANDING THE PROCESS OF ECONOMIC CHANGE (2005).

investment in risky startups.¹¹⁰ They also appear to fail to consider the risk a firm's investors took during the startup phases and the risk that a changing environment might bring a firm's success to an abrupt halt.

C. Proposals for Answering the Challenges of Digitization

This subsection summarizes selected proposals for change that have as, at least, part of their motivation the challenges of digitization. Each proposal reflects its author's views of market power, the effectiveness of antitrust, its purpose, and the conflicts between its traditions and digitization. Some question whether antitrust institutions can act on timely bases. Others take an end-of-history view, making proposals that treat today's digital leaders' assets as enduring competencies that cannot be duplicated or substituted for, much like exclusive rights of way and franchises have been for electric and water utilities. Some recognize technology change but see a single path into the future whose way is blocked by today's digital leaders. And some have confidence that government officials can redesign today's successful businesses into an equally successful sector, but with smaller firms.

Posner believes that current US antitrust laws are adequate for addressing the challenges of digitized markets, but expresses concern that antitrust authorities lack expertise and that the institutional processes are too slow.¹¹¹ He might be correct that the laws have sufficient suppleness, and faster processes would be helpful, but his article leaves unaddressed the conflict between the state of the art in practices and the realities of dynamic markets.

¹¹⁰ Teece & Coleman, *supra* note 62, at 821.

¹¹¹ Richard A. Posner, *Antitrust in the New Economy*, 68 ANTITRUST L.J. 925 (2001).

Limited expertise is also addressed by Morton et al. and Furman et al.¹¹² Morton et al. suggest a specialized judiciary, which could speed processes and diminish judicial confusion, but does nothing for agency expertise.¹¹³ Furman et al. suggest a digital markets regulatory unit that would perform *ex ante* regulation, specializing in the application of antitrust to digital businesses.¹¹⁴ Making recommendations specifically for the UK, the authors suggest that the unit would develop a code of conduct that would apply to large businesses, but not small ones. It would also adopt and enforce two types of rules – rules for individuals to port data about themselves between platforms and for open, non-personal data – to weaken the effectiveness of companies building unique databases. The unit would also promote open standards for platforms, presumably to promote more intra-system competition and a platform ladder of investment, such as was done in telecommunications networking by requiring network unbundling. Morton et al. recommend similar regulatory actions.

The Furman et al. and Morton et al. regulatory recommendations, along with Graef's recommendation that data and search rankings be considered essential facilities, represent an end-of-history view of digitization.¹¹⁵ The authors presume that today's firms' big data and artificial intelligence resources are essential for all digital firms going forward, and that these resources cannot be matched or exceeded by future firms.

These are troubling assumptions and conclusions for recommendations about antitrust in a dynamic industry. The assumptions of Crémer, Rey, and Tirole (2000)

¹¹² FIONA SCOTT MORTON, PASCAL BOUVIER, ARIEL EZRACHI, BRUNO JULLIEN, ROBERTA KATZ, GENE KIMMELMAN, A. DOUGLAS MELAMED, & JAMIE MORGENSTERN, REPORT OF THE COMMITTEE FOR THE STUDY OF DIGITAL PLATFORMS MARKET STRUCTURE AND ANTITRUST SUBCOMMITTEE (2019); Furman et al., *supra* note 31.

¹¹³ Morton et al., *supra* note 112, at 78.

¹¹⁴ Furman et al., *supra* note 112, at 5-7.

¹¹⁵ Furman et al., *supra* note 112; Morton et al., *supra* note 112; Inge Graef, *Rethinking the Essential Facilities Doctrine for the EU Digital Economy*, 53(1) *Revue juridique Thémis de l'Université de Montréal* 33 (2019).

and Carlton and Waldman (2002) that customer base is a source of market power in the presence of intertemporal network effects have been proven false by technology changes in the internet and in operating systems, and by large content providers developing competitive alternatives.¹¹⁶ Gilder explains that the business models of many of today's large tech firms are vulnerable because they are overly reliant on artificial intelligence, are experiencing diminishing returns to big data, rely upon network architectures that have inadequate security and that will be supplanted by distributed technologies like blockchain, and rely on zero prices that deny them critical information about consumers.¹¹⁷ Practices such as those offered by Furman et al., might lower the leading firms' economic advantages over their rivals, but it would come at a cost: The data portability, data sharing, and compatibility requirements would make it more economical for rivals to imitate today's leading firms than to try to surpass them in the next episodic change. This has echoes of how AT&T achieved a government-blessed shared monopoly: The company reached agreements with government and rivals that networks would be compatible and interconnected, with AT&T playing the central role for managing the telephone ecosystem.¹¹⁸

Holding that market power results from firm capabilities that are difficult to duplicate, Sidak and Teece suggest that antitrust authorities focus on these

¹¹⁶ Compare Crémer et al., supra note 86, Carlton & Waldman, supra note 87, with Cass, supra note 16; Christopher S. Yoo, *Paul Baran, Network Theory, and the Past, Present, and Future of the Internet*, 17(1) COLO. TECH. L.J. 161 (2018); P.J. Benghozi & J.P. Simon, *Out of the blue: the rise of CDN networks*, 101 COMM'N & STRATEGIES 107 (2016).

¹¹⁷ GEORGE GILDER, *LIFE AFTER GOOGLE: THE FALL OF BIG DATA AND THE RISE OF THE BLOCKCHAIN ECONOMY* (2018).

¹¹⁸ Milton Mueller, *Universal Service in Telephone History: A Reconstruction*, 17(5) TELECOMM. POL'Y 352 (1993); Michael A. Janson & Christopher S. Yoo, *The Wires Go to War: The U.S. Experiment with Government Ownership of the Telephone System During World War I* (2013). Faculty Scholarship. Paper 467. http://scholarship.law.upenn.edu/faculty_scholarship/467.

competences.¹¹⁹ Using Honda as an example, they explain that “rather than analyzing Honda’s market share in outboard motors, lawnmowers, and small electric generators, one might shed more light on the antitrust analysis by examining a capability profile or ‘market.’¹²⁰ Here the relevant capability might center on small, four-stroke internal combustion engines.”¹²¹ It appears that Sidak and Teece are correct that capabilities are more enduring than products and markets, but they fail to clearly delineate between capabilities that are uniquely valuable and so should be encouraged, and those that are harmful.¹²² They also suggest that policymakers examine barriers to entry at the firm level and over a longer time period. For example, government funding for research affects entry conditions.

Shapiro (2018), Furman et al. (2019), Morton et al. (2019), and Newman (2019) conclude that market power has been inadequately addressed in recent years and call for more aggressive enforcement of current antitrust rules.¹²³ Newman (2019) takes this one step further and suggests that laws specify that some business practices be illegal.¹²⁴ For example, he holds that social media companies design their services to hold users’ attention in ways that cause cognizable harms, and that the harms should be subject to antitrust enforcement. Such laws would be problematic in that the practice of enticing people’s attention is not unique to social media: newspapers, broadcasters, and politicians made such practices essential

¹¹⁹ Sidak & Teece, *supra* note 91.

¹²⁰ *Id.* at 617.

¹²¹ *Id.* at 617.

¹²² Section II in this paper provides such a delineation.

¹²³ Carl Shapiro, *Antitrust in a time of populism*, 61 INT’L. J. INDUS. ORG. 714 (2018); Furman et al., *supra* note 31; Newman, *supra* note 89; Morton et al., *supra* note 111, (2019) also recommend revising predatory pricing policies to protect companies that are less efficient than incumbents. They also recommend disallowing safe harbors based on the short-term of exclusive dealing agreements, and relaxing the proof requirements for antitrust plaintiffs and in some cases reversing the burden of proof. Mergers between dominant firms and substantial competitors or likely future competitors should be presumed to be unlawful.

¹²⁴ Newman, *supra* note 89.

elements of their business models.¹²⁵ The difference today is that the social media companies are doing it better.

II. Market Power in Dynamic Markets

This section develops a theory of market power that addresses the challenges presented by digitization. It defines market power as a firm's ability, derived from an unearned endowment, to receive profits that attract capital to this firm alone and not to current or potential rivals, or to other firms in the business ecosystem. This theory is applicable to less dynamic markets but is specifically intended to address problems of ambiguous and changing market boundaries, enduring economic factors or capabilities that can empower a firm to extract economic rents exclusively to its own benefit, and weak regulatory knowledge and slow processes. It begins by describing how economic capabilities and rents apply to a firm at stages of its lifetime and over its lifetime. It then addresses economic rents and firm behavior in the context of a dynamic sector marked with uncertainty and learning, where some businesses succeed, and others fail.

A. Analysis of a Firm in Isolation

Consider the formation of a firm from the perspectives of the entrepreneur and the investors who agree to form the firm as a means for developing and implementing an innovation.¹²⁶ In his study of the development of the computer and internet ecosystem, Walter Isaacson finds that successful innovation includes

¹²⁵ JOHN C. SOMMERVILLE, *HOW THE NEWS MAKES US DUMB: THE DEATH OF WISDOM IN AN INFORMATION SOCIETY* (1999).

¹²⁶ Hereafter this paper will use "investor" to refer to both investor and entrepreneur.

three basic stages.¹²⁷ The first is the development of an idea. Occasionally this is the work of an individual, but more often it is the work of an interdisciplinary team of creatives, often including scientists and psychologists. The process may be deliberate and sequential, as when Thomas Edison tasked engineers to experiment with different ways of building an incandescent lightbulb, or it may be non-sequential, as when Steve Jobs envisioned how computing machines might help people think and live.

The second stage in successful innovation is to develop the idea into a product. This is typically the work of engineers solving design problems for function and production. Examples would include the engineering team led by Vitalik Buterin to create the Ethereum platform and Apple's design team for the iPhone.

The third stage is developing and executing a successful business model for the product. This includes business strategy, marketing, organizational development, financial management, and the like. The collaboration between Mark Zuckerberg and Peter Theil formed much of Facebook's initial business model. Forming the business model appears to be the most difficult stage. Each type of firm failure identified by Ooghe and De Prijcker and Argenti represents a failure of management to create and sustain a business model, or to adapt it as circumstances change.¹²⁸ This could be one reason why Alexander Graham Bell served as a technical advisor to Bell Telephone Company – the telephone company that bore his name and became AT&T – rather than commercialize his invention himself.¹²⁹ (Encyclopedia Britannica 2019) Developing business models in digital markets is particularly complex because of the multisided nature of many digital products,

¹²⁷ WALTER ISAACSON, *THE INNOVATORS: HOW A GROUP OF HACKERS, GENIUSES, AND GEEKS CREATED THE DIGITAL REVOLUTION* (2014).

¹²⁸ Ooghe & De Prijcker, *supra* note 106; Argenti, *supra* note 106.

¹²⁹ David Hochfelder, *Alexander Graham Bell: American Inventor*, ENCYCLOPEDIA BRITANNICA, <https://www.britannica.com/biography/Alexander-Graham-Bell> (last visited Dec. 30, 2019).

perhaps contributing to a current trend that many digital entrepreneurs develop their products in hopes of selling them to existing firms.¹³⁰

In deciding whether to form a firm, investors consider their opportunity costs. Suppose that eight percent is the average risk-adjusted return on investment that can be received in the economy.¹³¹ For investors to be willing to launch the business, their expectations are that they will receive a return at least as great as eight percent. But a startup company does not immediately provide a positive return to investors. Although admittedly an extreme example, Uber has been in operation for over 10 years and apparently has never had a profitable year as of the time of this writing. According to some reports the company's cumulative losses were \$7.9 billion in its first 9 years. Because of early losses, those financing the development and launch of a business must believe that there will be later years in which the business will return more than eight percent. Indeed, Amazon lost money for seven years and took another 12 years before its cumulative earnings made up for the seven years of losses.¹³²

The cases of Uber and Amazon highlight one of the problems with traditional ways of defining market power. While in theory a firm is considered to have market power if it receives a return above what is needed to attract capital, the application of the theory lacks context in that the regulator views the firm at or near the pinnacle of its performance and does not see its development, its hits and misses, and its future. For example, Amazon's returns on equity for years 2016 through 2018 were

¹³⁰ MICHAEL A. CUSUMANO, ANNABELLE GAWER, & DAVID B. YOFFIE, *THE BUSINESS OF PLATFORMS: STRATEGY IN THE AGE OF DIGITAL COMPETITION, INNOVATION, AND POWER* (2019).

¹³¹ J.B. Maverick, *What is the Average Annual Return for the S&P 500*, INVESTOPEDIA (May, 21, 2019), <https://www.investopedia.com/ask/answers/042415/what-average-annual-return-sp-500.asp> (Eight percent is the average return for members of the S&P 500 from 1957 through 2018).

¹³² Robert Cryan, *Breakingviews - Uber's Losses are Nothing like Young Amazon's*, REUTERS (May 8, 2019), <https://www.reuters.com/article/us-uber-ipo-breakingviews/breakingviews-ubers-losses-are-nothing-like-young-amazons-idUSKCN1SE2RQ>.

12.29, 10.95, and 23.13 percent respectively.¹³³ These are above the S&P 500 average annual return of 8 percent: Indeed Amazon's 2018 return on equity was nearly three times the S&P 500 annual average return. But viewing these returns in isolation encourages a naïve view of economic rents. A more sensible view would take into account Amazon's returns on equity for 2013 through 2015, which were 4.45, -2.24, and 2.81 percent respectively.

A proper perspective considers the firm over time. To facilitate discussion, assume there are two types of regulators: A naïve regulator that follows standard practice and observes the firm only during times of profitability, and a sensible regulator that observes the firm over its lifetime, from launch to closing. Both observe profits, Lerner indices, and slopes of demand curves, but the naïve regulator does so only during times when the firm is receiving positive profits.

The naïve regulator might look at Amazon's operating margin – the difference between its revenue and variable costs, divided by revenue, which might serve as a proxy for the Lerner index – and observe that it was 3.1 in 2016 and 5.3 in 2018. This could be interpreted as demonstrating market power, so the naïve regulator might next look at return on equity, which from 2016 through 2018 was 17.09 percent, or more than double the average annual return in the S&P 500. And return on equity increased from 2016 to 2018. Then reviewing Goolsbee and Chevalier, the naïve regulator would find estimates of price elasticities of demand for Amazon between -0.25 and -0.38, which imply downward sloping demand that appears quite insensitive to prices.¹³⁴ All of these indicators imply market power to the naïve regulator.

¹³³ Macrotrends, Amazon Financial Ratios for Analysis 2005-2019, <https://www.macrotrends.net/stocks/charts/AMZN/amazon/financial-ratios> (accessed October 4, 2019).

¹³⁴ Austin Goolsbee & Judith Chevalier, *Measuring Prices and Price Competition Online: Amazon vs. Barnes and Noble*, (Nat'l Bureau of Econ. Research, Working Paper No. 9805, 2002).

But the sensible regulator would look deeper. It would note that Amazon's operating margins and returns on equity are volatile. The former ranges from 0.2 in 2014 to 5.9 in 2018 and falls from 5.1 in 2005 to 1 in 2013. Returns on equity fall from 135.37 percent in 2005 to -2.24 percent in 2014. So, results for any period of just a few years appear anomalous taken in a broader context. And if Reuters is correct that all Amazon did is recoup investments from its founding in 1994 through 2013, then it is unclear from public data whether the firm's financial performance has kept up with the S&P 500, although its stock price has performed better at times.

So, it is hard to make a valid case for market power with just a few years of observation. The next subsection examines market power in the presence of uncertainty.

B. Market Power with Uncertainty

The previous subsection explains how a firm's performance must be considered over a long period of time when examining whether the firm has market power. But such an analysis is inadequate by itself because it implicitly assumes that investors know the firm's future profits. In reality a large number of startups fail and those creating startups do not know *ex ante* which will succeed, and which will not. Incumbent firms decline as well. A proper analysis should consider this uncertainty.

In any production period, investors have to decide where to allow their capital to be used. When considering an existing firm, investors decide whether the firm will have positive cash flow and whether to invest that positive cash flow in the firm's future, bring money in from the outside for investment purposes, distribute cash to shareholders, etc. Similar decisions are made regarding startup firms. Investors make these decisions based upon their expectations about the specific firm, given the uncertainty of their expectations. If the expectations are that the firm will return less than investors' opportunity costs over the remainder of the firm's lifetime,

investors will withdraw from and close the firm. Otherwise funders continue providing new capital or allow the firm to retain and invest the cash it has or is generating. Given their uncertainty, funders form expectations about the range of possible returns that a firm might provide and the likelihoods of those returns.

To illustrate, consider investors deciding whether to fund a firm in a sector. To simplify discussion, assume that investors decide at the beginning of each year whether to provide funding and then stay with their decisions for 12 months. Also assume that there are 100 firms in the sector, that each year about 50 firms are launched and 90 percent of these fail, and that about 5 percent of the 100 firms close due to failures to adapt to some change. This gives a steady state of 100 firms and an annual failure rate of 1/3. If the expected average loss for the 45 failed startups and 5 failed established firms is $-\$X \leq 0$, then for investors to fund the 100 established firms and 50 startups, investors must expect that the successful firms, which they cannot identify at the start of the year, will have an average return of at least $\frac{\$X}{2}$ above the 8 percent return obtainable elsewhere in the economy.

One might think that if investors discern that established firms and startups have different failure rates, then investors would set different minimum expected returns for the two groups. Continuing to assume that an average failed firm loses $-\$X$, this view would say that investors must expect an average return of at least 8 percent plus $\frac{\$X}{95}$ for surviving established firms and 8 percent plus 9 times $\$X$ for surviving startups.

But this view makes a false dichotomy between existing firms and startups. Surviving startups are the established firms of the next year. And per the analysis of the firm in isolation, a successful startup does not receive its 8 percent plus 9 times $\$X$ during its first year. Instead, this is the return that investors expect to be achieved over the firm's lifetime. In practice the initial investors expect a successful startup to have prospects for 8 percent plus 9 times $\$X$, to not receive them in the

firm's first year, so that, if the initial investors decide to sell their ownership shares, the selling prices will reflect the present value of these prospective profits.

Now consider how investors establish these expectations. Expectations are beliefs about the future and are created through past experiences and knowledge of new circumstances. The relevant past experiences are those that highlight where prior beliefs have been right or have been wrong, including beliefs about firms' abilities, their markets, laws and regulations, and the value of expending resources to update beliefs.¹³⁵ So investors examine their past expectations and compare them to actual outcomes. In doing so they reach conclusions about how their beliefs that led to prior expectations aligned with or misaligned with reality, how circumstances appear to have changed, what laws and regulations have been in the past and how they have been carried out, and how laws and regulations and their execution might change in the future. Regarding production and market conditions, investors must believe that profits will not be competed away by, for example, Bertrand competition in homogeneous or nearly homogeneous products. This implies that they must experience successful firms facing downward sloping demand. And given that, relative to other sectors, digital products have high fixed costs relative to marginal production costs, the investors must also believe that successful firms' Lerner indices are higher than for other sectors. Finally, they must believe that antitrust will not behave opportunistically and appropriate or redistribute future temporal profits when they appear high.

So, the traditional indicators of market power – positive economic profits, Lerner indices approaching one, and downward sloping demand – will be normal in a dynamic sector where investors continue to support startups. This implies that the traditional indicators have almost no correlation with market power. Indeed, a firm

¹³⁵ Janice Hauge & Mark Jamison, *Identifying Market Power in Times of Constant Change* (Univ. of Fla., Warrington Coll. of Bus., PURC Working Paper, 2016).

with market power is likely to have these features, but so will all successful firms in a dynamic market. This is beyond the problem of indicators providing false positives to them being largely irrelevant.

The above analysis does help clarify when a firm should be considered to have market power. In the illustration, investors make choices while unable to distinguish between successful and unsuccessful firms *ex ante*, and in the context of learning experiences for investors. The expected profits of successful firms – learned from observing profits of presently and recently successful firms -- incentivize investors to build firms that compete for those profits or participate in the business ecosystems, even though most of these new firms eventually fail.

This implies that for a firm to be considered to have market power in the sense that it has control in its markets, it will be true that the firm's profits have limited if any positive impact on investments in actual and potential rivals. Said differently, the firm's profits do not attract the funding of rivals seeking to achieve the next episodic disruption or to innovate within the current business ecosystem. And the firm's profits provide only limited learning for investors in that they inform only about this firm and now about the sector in general. If the developers of rivals believe the profits of a successful firm are assailable, then higher successful-firm profits should be positively correlated with investment in the sector. If there is no positive correlation or if the positive correlation is small, then the successful firm might have market power.

“Might” is an important word in the previous sentence because the investment effect is a necessary, but not sufficient condition for market power. But before exploring sufficient conditions, it is useful to explain the investment effect of the successful firm's profits more precisely.

A study of a single firm's profits and how they impact investment in actual or potential rivals needs comparisons to be informative. Because firms and industries vary in their scale, measurements used should be unitless and unaffected by size so

that comparisons can be made across sectors and over time. These needs imply that the measurements should be elasticities. More specifically, the benchmark for comparison should be the profit elasticity of investment for leading firms in multiple sectors, i.e., the percentage change in sector investment divided by the percentage change in expected profits of the leading firms. This elasticity should be estimated controlling for factors that influence it but that should be largely unrelated to market power, such as sector capital intensity, turnover, risk, and growth. This benchmark should be compared to the profit elasticity of sector investment for the firm being studied. Its elasticity would be measured as the change in sector investment divided by the change in the firm's expected profits, i.e.,

$$Index = \frac{e_n}{e_{LB}}$$

Where e_n is the percentage change in rival and intended rival firms' investments divided by the percentage change in profits for the firm in question, and e_{LB} is the corresponding ratio for the benchmark sectors. A significant difference between this firm's profit elasticity of sector investment and the benchmark indicates that there may be market power. So, an elasticity index less than one implies that n 's profits attract less investment into rivals than do the profits of the leading firms in the benchmark sectors. An index of zero would result from n extracting all or nearly all economic surplus.

There are three reasons why a firm's elasticity might be low relative to the benchmark. One is that the firm might have superior capabilities that rivals and potential rivals view as unassailable. This may have been the case with Alcoa where antitrust regulators were unsuccessful in enticing potential rivals to compete head

to head with the market leader.¹³⁶ Another reason is that the current business ecosystem has been in place for a few years and investors believe that the next episodic disruption will occur soon, meaning that the firm's profits may be short lived and not worth pursuing. The third reason is that the firm could have market power, i.e., there are factors other than capabilities that the firm has constructed that prevent others from being able to compete for the value that the firm provides to customers.

This view of market power aligns with the views of Smith and Mill, and with the underlying motivations of economists following the tradition of Cournot and Lerner.¹³⁷ Smith and Mill concerned themselves with factors that effectively prevented competition and that were endowed to the firm by government or nature. For example, Smith was particularly critical of the British East India Company, which was formed by the British government and benefitted from its patronage. After Lerner's seminal work, economists began focusing on analytical models of market power, largely assuming some endowment.

Because an elasticity index near zero is not a sufficient condition for market power, upon a finding that it is near zero, attention should be turned to reasons why rivals are uninterested in pursuing the profits. The factors of interest are those endowed by government or nature, not those created by the firm for reasons already stated. Regulation is known to favor large firms over small ones, so antitrust authorities should pursue challenging government actions that provide a firm with an unmerited advantage even if the advantage isn't necessarily targeted to the firm in question.¹³⁸ There may be legitimate reasons for government restrictions on

¹³⁶ Robert W. Crandall, *The Failure of Structural Remedies in Sherman Act Monopolization Cases*, 80(1) OR. L. REV. 109 (2001).

¹³⁷ Smith, *supra* note 9; Mill, *supra* note 19; Cournot, *supra* note 1, Lerner, *supra* note 2.

¹³⁸ James B. Bailey & Diana W. Thomas, *Regulating Away Competition: The Effect of Regulation on Entrepreneurship and Employment*, 52(3) J. REG. ECON. 237 (2017).

competition, such as the impracticality of competition for utility infrastructure, for example, water and power lines. But otherwise it seems appropriate to presume that government-based barriers to competition generally result in regulatory burdens that apply to all or most of the firms in a sector, or from rent seeking. Such barriers should be investigated accordingly. Indeed, this should be an area of study for antitrust authorities prior to becoming concerned with whether particular firms have market power.

Natural barriers to competition are not necessarily an antitrust problem. There may be situations where nature provides such barriers, but the possessing firm competed with others or otherwise expended economic resources to acquire the benefit. For example, there may be situations where firms competed for intellectual property patents or radio spectrum licenses that, once obtained, provide an unassailable competitive advantage. If the competition occurred without expectation that the advantage would have to be provided to rivals, then government would be behaving opportunistically to *ex post* take away the profit through an antitrust or other regulatory action. So, another area of work for antitrust authorities is to *ex ante* examine situations where firms will compete for endowments and establish policies that balance the need for profits that will drive investment with the value of multiple firms obtaining access to the monopoly asset.

III. Implications for Antitrust

Defining market power as suggested in this paper would focus antitrust on situations where firms are able to ignore rivalry and extract unusual amounts of economic value. It would encourage disruptive technology and industry change because investors would believe that future profits would not be appropriated by antitrust regulators.

To illustrate the latter point, consider a situation where a business such as Amazon that serves as a platform for third party retail sales and also sells its own retail products. The platform faces the question of whether to formulate its platform features to favor its retail products, favor third party products, or be indifferent to who is selling to the retail customer. Assuming the products compete, the platform might favor the third-party products if they are more profitable at the margin than the platform's own products or favor its own products if the reverse is true. The platform might be neutral if the profits at the margin are the same between third party and platform-provided retail products.

But the platform might find itself in violation of antitrust rules if it favors its own products. Such was the case for Google when the European Commission (EC) believed that Google was biasing its search engine results to favor its own products.¹³⁹ What the EC apparently missed is that the discrimination, if it exists, might benefit consumers in at least two ways.

One way it could benefit consumers is by increasing the marginal profitability of attracting users to the platform. This higher profitability provides an incentive for the platform to improve quality or provide more attractive pricing options for retail and/or wholesale users. Also, this improved platform profitability might attract investors to potential rivals, especially those that want to pursue the high profit potential for the next episodic disruption.

Now consider the effects of an antitrust rule that limits a platform's ability to discriminate once the platform reaches a particular level of success. If the platform has market power such that its profit elasticity of investment is near zero, the profit limit has little effect on consumers except for the disincentive for this platform to improve its quality. But if the profit elasticity is positive and in a normal range, then

¹³⁹ Kevin Caves & Hal Singer, *When the Econometrician Shrugged: Identifying and Plugging Gaps in the Consumer-Welfare Standard*, 26(2) GEO. MASON L. REV. 395 (2019).

profits are driving investments that will speed the next episodic disruption, attract imitators, and possibly attract complementors. The effect of the profit limits is to slow competition and innovation beneath what customers might find optimal.

The discrimination issue raises the question of how to value innovation. Caves and Singer hold that typical consumer welfare estimates miss the value of innovations that may be held back by the exercise of market power.¹⁴⁰ To capture this effect, they suggest that innovation should be added ad hoc to consumer welfare analyses and offer that a goal of antitrust should be to maximize the number of innovations.¹⁴¹ This paper's elasticity approach should capture any rival investment suppression that would result from a platform possessing and exercising market power. For example, Diapers.com has accused Amazon of leveraging its platform ownership to favor its own product that competes with Diapers.com.¹⁴² If this is true and of economic significance, it would measurably lower Amazon's profit elasticity of investment in the retail space.

The elasticity approach also avoids problems resulting from creating new regulatory instruments that encourage opportunistic behavior by lowering costs for rent seeking. For example, Furman et al.'s recommendations for a specialized regulator and new regulatory powers over data create disincentives for rivals to build disruptive platforms because the regulatory rule is that profits will be limited if success becomes "too large."¹⁴³ Furthermore, as Kahn explains in the case of telecommunications competition in the US, the government's practice of giving rivals access to incumbents' assets at low prices discourages rivals from building their own assets, which slows the development of episodic disruptions.¹⁴⁴ Kahn also

¹⁴⁰ *Id.*

¹⁴¹ *Id.*

¹⁴² Furman et al., *supra* note 112.

¹⁴³ *Id.*

¹⁴⁴ Alfred E. Kahn, *The Deregulatory Tar Baby: The Precarious Balance Between Regulation and Deregulation, 1970±2000 and Henceforward.* 21(1) J. OF REG. ECON. 35 (2002).

observes that economic regulators in markets with competition sometimes pursue their own biased views of market outcomes.¹⁴⁵ In some instances, the regulatory decisions favor particular industry players or customer groups. In other instances, the decisions seek to impose stability in moments where disruption serves economic progress.

The elasticity approach presented in this paper addresses these concerns by focusing antitrust on industry conditions rather than a particular firm's situation. The regulator would not make decisions about market structure, which would bias market outcomes.

This approach should also resolve the challenges of defining markets. Market definition is a costly and controversial process in antitrust and wrought with problems of data decay and imprecision.¹⁴⁶ It is also subject to the cellophane fallacy, where a test for substitutability of products gives a false positive because the price for the product in question is already at a monopoly level.¹⁴⁷ The elasticity approach avoids this fallacy by focusing on the effects of profits directly, avoiding the issue of product substitutability.

IV. Conclusion

This paper offers new metrics for redefining market power. The definition used in antitrust in recent decades has become problematic because of its implicit assumptions that markets are stable and current profits above opportunity costs constitute economic rents against the economy. The definition of market power has also risen in importance because persons relying on studies using traditional

¹⁴⁵ *Id.*

¹⁴⁶ Baker, *supra* note 41.

¹⁴⁷ George W. Stocking & Willard F. Mueller, *The Cellophane Case and the New Competition*, 45(1) THE AM. ECON. REV. 29 (1955).

indicators of market power conclude that market power is rising and causing harm. They recommend that market structure should be changed by using tools of antitrust.

This paper's definition of market power is based on fundamentals found in Smith and Mill.¹⁴⁸ A firm should be considered to have market power if its profits are simply economic rents, stimulating no economic activity by other firms, and if the rents arise from unearned endowments that protect profits.

More work is needed on this topic. One area of work is on unearned endowments. Research on barriers to competition have focused on those constructed by firms, sometimes mistakenly including competitive advantages that firms build to the benefit of customers. Perhaps for good reason antitrust regulators have spent less time on barriers created by government itself. There is also good reason to believe that these may be the most important and the most problematic. Further work is also needed on the profit elasticity of investment to refine how it should be measured, control variables, and time periods.

¹⁴⁸ Smith, *supra* note 9; Mill, *supra* note 19.