Title: Competition Law for a Post-Scarcity World

Author: Salil K. Mehra

COMPETITION LAW FOR A POST-SCARCITY WORLD

Salil K. Mehra
<smehra@temple.edu>

ABSTRACT: Writers, economists and IP scholars have hailed signs of an incipient shift to a post-scarcity world. Driving this change are rapid decreases not only in marginal cost, but also in the fixed or first-unit costs of production. Whether these changes become economy-wide, or remain confined to a subset of industries, they have dramatic implications for competition law and policy. This Article is the first to address these implications. In particular, because of the incentive for incumbent firms to engage in what may be termed "anti-disruption" – as examples such as the Apple/e-books antitrust case and the regulatory responses to Uber show – competition law must play an active role in assisting the transition to a post-scarcity world. Playing this role will not be simple, but the welfare gains of this societal shift make it impossible to ignore.

Table of Contents

I. Introduction 1
II. Towards a Post-Scarcity Economy? 7
A. Star Trek vs. Margaret Atwood vs. Paul Krugman 7
B. Post-scarcity economics and the law 10
C. Beyond IP – falling marginal and fixed costs of production 12
III. A Competition Law Response? 14
A. Protecting Innovation by Preventing "Anti-disruption": the Apple/eBooks case as example 15
B. The declining importance of efficiencies in a decreasing-cost world 22
C. Post-scarcity and the essential facilities doctrine 29
IV. Post-Scarcity, Artificial Scarcity and State Power 32
A. Uber, the Sharing Economy and Artificial Scarcity 33
B. Artificial Scarcity and the State 36
C. Prescriptions 38
V. Conclusion 40

Competition Law for a Post-Scarcity World

by Salil K. Mehra[1]

> Now it is true that the needs of human beings may seem to be insatiable. But they fall into two classes – those needs which are absolute in the sense that we feel them whatever the situation of our fellow human beings may be, and those which are relative in the sense that we feel them only if their satisfaction lifts us above, makes us feel superior to our fellows . . . [As for] the absolute needs – a point may soon be reached, much sooner than perhaps we all of us are aware of, when those needs are satisfied in the sense that we prefer to devote our further energies to non-economic purposes.
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> –John Maynard Keynes[2]

I. Introduction

Young Americans have more education than their predecessors, yet unemployment and underemployment are critical – and possibly worsening – problems.[3] Apple is the most valuable company in the world, but its total employees are a tiny fraction of the number who once worked at the firms that used to hold that title.[4] Investments in technology have paid off in tremendous efficiencies but unequal results; consider the tremendous impact of, to take one example, the ridesharing service Uber, which unlocks the tremendous potential of underutilized private cars but leads to increasingly

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[1]Professor of Law, James E. Beasley School of Law smehra@temple.edu.

[2]JOHN MAYNARD KEYNES, *Economic Possibilities for Our Grandchildren*, *in* ESSAYS IN PERSUASION 358 (London: Macmillan, 1931) *available at* http://www.gutenberg.ca/ebooks/keynes-essaysinpersuasion/keynes-essaysinpersuasion-00-h.html.

[3]*See* Derek Thompson, *The Economy Is Still Terrible for Young People*, THE ATLANTIC, May 19, 2015, *available at* http://www.theatlantic.com/business/archive/2015/05/the-new-normal-for-young-workers/393560/.

[4]*See* Paul Krugman, *Profits Without Production,* N.Y. TIMES, June 21, 2013, *available at* http://www.nytimes.com/2013/06/21/opinion/krugman-profits-without-production.html ("Consider the changing identity of the most valuable company in America . . . GM had more than 400,000 employees . . . But now it's Apple, which has hardly any employees . . . ").

low pay for those who drive them.[5] These technologies are helping drive GDP in the United States to record levels – but at the same time, they may accelerate economic and political inequality, as "[t]hose who own the robots and the tech are becoming the new landlord rentier types" and "it's hard to penetrate beyond the barrier on education alone."[6] Increasingly, economic thinkers have come to take seriously the possibility that such developments are the result of moves towards a "post-scarcity" society.[7]

Talk of a post-scarcity society can easily sound like the stuff of science fiction,[8] or techno-utopianism, or worse, blithe disregard for the billions of people on the planet for whom real scarcity of basic needs is very much an entrenched difficulty of the present.[9] Nevertheless, the convergence of a series of technological developments has convinced observers both within law and without that, at least in some industries, highly developed economies are approaching a world in which goods may be produced at or near a marginal cost of zero – and where, increasingly, also fixed or first-unit costs[10]

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[5]Jack Smith IV, *Uber Drivers are Scrambling to Make Ends Meet After Latest Fare Cuts*, NEW YORK OBSERVER, Feb. 9, 2015, , *available at* http://observer.com/2015/02/uber-drivers-are-scrambling-to-make-ends-meet-after-latest-fare-cuts/.

[6]Izabella Kaminska, *Time to take basic income seriously?*, FTALPHAVILLE, June 17, 2013 (quoting economist and Nobel laureate Paul Krugman), http://ftalphaville.ft.com/2013/06/17/1536022/time-to-take-basic-income-seriously/.

[7]*See* Michael Rapoport, *NYCC 2015: Paul Krugman and Brad DeLong Ponder the "Star Trek" Economy*, WSJ SPEAKEASY, Oct. 12, 2015, http://blogs.wsj.com/speakeasy/2015/10/12/nycc-2015-paul-krugman-and-brad-delong-ponder-the-star-trek-economy/ (describing panel discussion in which economic professor and former Treasury Department official DeLong notes that "[w]e've actually come a long way toward a 'post-scarcity' society already"); Izabella Kaminska, *Larry Summers on forwarding the Doozer economy*, FTALPHAVILLE, Apr. 17, 2014, http://ftalphaville.ft.com/2014/04/17/1832512/larry-summers-on-forwarding-the-doozer-economy/ (describing interview by Chrystia Freeland of former Treasury Secretary and World Bank chief economist Lawrence Summers in which the latter stated that "there's something more significant going on in the industrialized global economy that the effects of a banking crisis per se, and that 'something' is probably technological abundance").

[8]Indeed, science fiction repeatedly presents examples of post- or almost-post scarcity societies. *See, e.g.*, Abhimanyu Das & Charlie Jane Anders, *Post-Scarcity Societies (that Still Have Some Scarcity)*, IO9, Sept. 30, 2014, http://io9.com/post-scarcity-societies-that-still-have-scarcity-1640882232 (last visited Apr. 14, 2015).

[9]Despite the fact that the UN Millennial Development Goals' target of halving the proportion of the world's people in extreme poverty was met five years' prior to the target date of 2015, in that year there more than 800 million people continued to live in extreme poverty. *See* Millennium Development Goals and Beyond 2015, http://www.un.org/millenniumgoals/poverty.shtml (last visited Jan. 26, 2015).

[10]This Article combines the categories of fixed and first-unit costs as they have been traditionally understood, in examples such as printing presses and factory

are falling rapidly.[11] To clarify, this is not simply the familiar world of nominally zero-dollar priced goods, in which users "pay" with, for example, the yielding of their valuable private information.[12] Instead, some accounts

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equipment. However, it should be noted that, as discussed in this paper, future first-unit costs such as 3D printers may not be fixed for particular products or categories of products in the manner that printing presses and factory equipment traditionally have been. *See infra* Section II.B. and surrounding text.

[11]*See, e.g.*, Mark A. Lemley, *IP in a World Without Scarcity*, 90 N.Y.U. L. REV. 460 (2015); John Hornick, *3D Printing and IP Rights: The Elephant in the Room*, 55 SANTA CLARA L. REV 801, 802 (2015) (discussing the "potential [of 3D printing] to democratize manufacturing, meaning that almost anyone may be able to make almost anything" along with the concern that "a growing number of people simply do not like intellectual property"); Timothy R. Holbrook & Lucas S. Osborn, *Digital Patent Infringement in an Era of 3D Printing*, 48 U.C. DAVIS L. REV. 1319 (2015); Kyle Langvardt, *The Replicator and the First Amendment*, 25 FORDHAM INTELL. PROP., MEDIA & ENT. L. J. 59 (2015) (describing likely First Amendment challenges of to attempts to restrain 3D printing as it advances toward its "theoretical endpoint . . . a machine that, like the 'replicators' of Star Trek, can produce anything the user asks for out of thin air from a digital blueprint); James Grimmlemann, *Indistinguishable from Magic: A Wizard's Guide to Copyright and 3D Printing*, 71 WASH. & LEE L. REV. 683 (2014) (arguing that 3D printing does not require changes to copyright doctrine, but acknowledging potentially quite difficult enforcement challenges analogous to music industry's battles with file-sharing); JEREMY RIFKIN, THE ZERO MARGINAL COST SOCIETY: THE INTERNET OF THINGS, THE COLLABORATIVE COMMONS, AND THE ECLIPSE OF CAPITALISM (St. Martin's Griffin 2014); Deven R. Desai & Gerard N. Magliocca, *Patents, Meet Napster: 3D Printing and the Digitization of Things*, 102 GEO. L.J. 1691 (2014); Ben Depoorter, *Intellectual Property Infringements and 3D Printing: Decentralized Piracy,* 65 HASTINGS L. J. 1483 (2014); Phoebe Li , Stephen Mellor, James Griffin, Charlotte Waelde, Liang Hao & Richard Everson, *Intellectual Property and 3D Printing: A Case Study on 3D Chocolate Printing*, 9 J. INTELL. PROP. L. & PRAC. 322 (2014) (describing "3D printing as a 'disruptive technology' [that] challenges the existing intellectual property framework" based on an examination of actual 3D chocolate printing technology scenarios); Skyler R. Peacock, *Why Manufacturing Matters: 3D Printing, Computer-Aided Designs, and the Rise of End-User Patent Infringement*, 55 WM. & MARY L. REV. 1933 (2014); Davis Doherty, *Downloading Infringement: Patent Law as a Roadblock to the 3D Printing Revolution,* 26 HARV. J. L. & TECH. 353 (2012).

[12]*See, e.g.*, John M. Newman, *Antitrust in Zero-Price Markets: Foundations,* 164 U. PA. L. REV. 143 (2015) ("customers of zero-price products pay for those products, primarily by exchanging their attention and/or information"), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2474874; Alec J. Burnside, *No Such Thing as a Free Search: Antitrust and the Pursuit of Privacy Goals,* CPI ANTITRUST CHRONICLE, May 29, 2015, *available at* http://www.cadwalader.com/uploads/books/ab5e2ca2b45bae232e10996c57017a4a.pdf; Michal S. Gal & Daniel L. Rubinfeld, *The Hidden Costs of Free Goods: Implications for Antitrust Enforcement* (UC Berkeley Public Law Research Paper No. 259425), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2529425; Chris Jay Hoofnagle

observe that for many already near-zero marginal cost goods traditionally protected by intellectual property law – such as software, recorded music and video entertainment – even the high initial fixed production costs are falling drastically.[13] According to this account, the combination of the rise of the Internet, the development of collaborative innovation and production, and the advance of 3D printing, are leading to a post-scarcity society. Knowledgeable economists and business writers take the possibility of an economy "beyond scarcity" seriously.[14] Simply put, Star Trek's replicator may be closer to reality than previously thought.[15]

Economists, most notably John Maynard Keynes, recognized this possibility decades ago. In 1930, Keynes observed that "the economic problem" – that is, material scarcity – "may be solved, or be at least within sight of solution, within a hundred years."[16] Keynes' timing may be surprisingly accurate; legal scholars, particularly in the field of intellectual property, have of late recognized the implications of this possibility.[17]

While this may seem like naïve over-optimism, in fact, commentators have recognized that even if society attained the potential to build a post-scarcity economy, social, economic and political forces exist that would seek to prevent its realization. Indeed, Keynes himself recognized this nearly a century ago.[18] Economists, economic journalists, and science-fiction writers

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& Jan Whittington, *Free: Accounting for the Costs of the Internet's Most Popular Price*, 61 UCLA L. REV. 606, 606 (2014) ("Offers of free services abound on the Internet"); David S. Evans, *The Antitrust Economics of Free*, 7 COMPETITION POL'Y INT'L 71, 76 (2011).

[13]*See, e.g.*, Marc Andreesen, *Why Software is Eating the World*, WALL ST. J., Aug. 20, 2011, *available at* http://www.wsj.com/articles/SB10001424053111903480904576512250915629460.

[14]*See, e.g.*, Izabella Kaminska, *The parable of water*, *in* BEYOND SCARCITY SERIES, FTALPHAVILLE, June 7, 2012, http://ftalphaville.ft.com//2012/06/07/1031561/beyond-scarcity-the-parable-of-water/ (last visited Apr. 14, 2015) (24-part series starting in 2012 by the Financial Times' Alphaville Blog, including discussion of economist Lawrence Summer's views on the real possibility of the need for post-scarcity economics).

[15]*See infra* Section II.A.

[16]John Maynard Keynes, Economic Possibilities for our Grandchildren (1930).

[17]Barton Beebe, *Intellectual Property Law and the Sumptuary Code*, 123 HARV. L. REV. 1, 6 (2010) (observing that a "*post-rarity* society is already upon us" (emphasis in original)).

[18]John Maynard Keynes, *The General Theory and After, Part I: Preparation*, *in* 13 THE COLLECTED WRITINGS OF JOHN MAYNARD KEYNES 491 (Macmillan Press 1973) (stating that "[e]conomic welfare and social well-being will be increased in the long run by a policy which tends to make capital goods so abundant, that the reward which can be gained from owning them falls to so modest a figure as to be no longer a serious burden on anyone . . . None of this, however will happen by itself or of its own

have all recognized that technology has created "something of a self-cannibalizing effect for most of the capitalist system" in which the greater the tech-driven "abundance, the more likely capital itself would be undermined," inducing the owners of capital to "protect[] their rate of profit by stalling efficiency [and through] monopolization."[19] These writers fear "artificial scarcity" and worry that "profits increasingly reflect market power rather than production."[20]

Despite classic concerns that call for a competition law response – that incumbent firms' privately optimal conduct would harm overall economic welfare[21] – American antitrust scholarship has yet to engage with this development; this Article is the first advocate for a role for U.S. antitrust law in the emergence of a post-scarcity economy.[22] Regrettably, determining the exact likelihood that a broad post-scarcity economy will emerge is beyond the scope of this Article. Significantly, though, even if the changes at work do not become broadly economy-wide, they will still impact antitrust law greatly, since antitrust analysis proceeds market by market and industry by industry. Accordingly, this Article takes the movement towards post-scarcity as a given, and asks: what sort of competition law, if any would be needed? It argues that the likelihood that a post-scarcity economy will develop hinges on changes in competition policy – that is, antitrust law is not exogenous to the realization of a post-scarcity society. Despite antitrust law's deep ties to economic theory and analysis, the implications of a post-scarcity society have not yet been appreciated. This Article has two goals: First, it provides an account of the drivers of the trend towards a post-scarcity society and how they will challenge the heartland of antitrust legal analysis. Second, with that snapshot as a springboard, this Article identifies and analyzes the normative consequences for consumer welfare and antitrust law. To be sure, the interdependent technological and social changes that are working to drive costs down are still works-in-progress; an

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accord. The system is not self-adjusting, and without purposive direction, it is incapable of translating our actual poverty into our potential plenty").

[19]Kaminska, *supra* note 6; Paul Krugman, *Sympathy for the Luddites*, N.Y. TIMES, June 13, 2013, *available at* http://www.nytimes.com/2013/06/14/opinion/krugman-sympathy-for-the-luddites.html?_r=0; Tom Streithorst, *The Economics of Mad Max and Star Trek*, L.A. REV. BOOKS, June 21, 2013, *available at* https://lareviewofbooks.org/essay/the-economics-of-mad-max-and-star-trek.

[20]Krugman, *supra* note 4.

[21]*See* KEITH N. HYLTON, ANTITRUST LAW AND ECONOMICS (Elgar 2010), p.97 (explaining and applying these standard questions in antitrust law).

[22]This Article uses the term "competition law" to denote a broader body of law worldwide that aims to address anticompetitive restraints whether private or public in origin, and uses "antitrust law" to denote the American approach focusing overwhelmingly on private restraints with a very limited application to anticompetitive use of state power. Because of the large scope of overlap, the terms are mostly interchangeable.

effort to describe and predict their future interrelationship with antitrust law must necessarily be partial, tentative and quickly outdated. Nevertheless, the transformation that they are effecting is too important to disregard.

Of course, at first glance, one might ask: why would a world in which production costs approach zero need competition law – wouldn't everything just be more or less free? This Article argues that, perhaps counter-intuitively, as we advance towards the potential for zero cost production, the need for antitrust – and a *different* kind of antitrust – may actually be greater. As a result, this Article proposes a new role for antitrust in assisting the transition from the "legacy" economy of scarcity to the predicted post-scarcity world. Taking the potential of a post-scarcity world as a given, competition law should recharge and focus itself on two targets: it should combat private exclusionary conduct that threatens cost-reducing innovation and it should fight the use of state power to maintain or create artificial scarcity. Simply put, we need antitrust for the transition; there are reasons to think that incumbent firms – and the policymakers who collect rents from them – may have strong incentives to prevent the transition to a post-scarcity society.

More specifically, this Article explains that in important recent examples, such as the *Apple/e-books* antitrust case and the regulatory responses to Uber, traditional industry incumbents have a powerful incentive to engage in "anti-disruption" – that is, it is optimal for them to harm social welfare by inhibiting technology-driven cost reductions. In making this argument, this Article proceeds with four following sections. Part II provides an overview of the changes that are leading observers to predict an imminent post-scarcity economy. Then Part III, using the *Apple/e-books* case as a jumping-off point, sketches an approach to anti-disruption; it further explains that antitrust's traditional balance of fears of increased market power versus hopes for increased efficiency of production tips towards more active antitrust as production costs approach zero – essentially, there remains less and less cost left to wring out through greater efficiency. In Part IV, the focus turns towards the adverse competitive effects of state power; the desire for economic profits may drive firms towards expending more effort at rent-seeking by using private anticompetitive restraints or lobbying government for favorable anti-consumer action. As a result, Part V provides some prescriptions. While American antitrust law already has a history of taking aim at private, and to a lesser degree, public anticompetitive restraints, the transition to a post-scarcity economy will require a rethink – and to some degree a rejection – of the Chicago-school dogma that forced a retrenchment in addressing private exclusionary conduct. It will also require a willingness to take a more aggressive tack against anticompetitive government action than federal courts traditionally have done. As a result, to the extent that firms currently face a choice between investing in achieving greater efficiencies on the one hand or

spending to achieve market power through collusion, exclusion or lobbying the state on the other, a post-scarcity world makes the latter set of welfare-destroying choices more attractive; a brief conclusion notes the potential magnitude of the gain that could result from from stopping private interests from preventing a post-scarcity world.

II. Towards a Post-Scarcity Economy?

Our digital age runs on the increased speed, power and influence of Internet-linked computers, making possible previously unexpected levels of mass collaboration, and the large-scale collection and analysis of data.[23] These developments give us more powerful information and communication devices; ordinary people "own electronic toys that millionaires and kings would have lusted for a decade ago."[24] Recent applications to the manufacturing and service sector have forced thinkers from a variety of fields to contemplate the birth of a post-scarcity economy.

To identify, in a general way, what thinkers describe as a post-scarcity economy, this Section sets forth two defining accounts. First, it sets out the predictions and positive descriptions recently emerging from writers, economists and others. Second, it reviews the impact that post-scarcity thinking has had in the field of intellectual property law; in particular, IP scholars have identified a series of technologies that drive the trend towards a post-scarcity society, at least with respect to IP. Finally, this Section considers the implications of these two accounts for thinking about production costs and efficiency – longstanding touchstones for competition law.

A. Star Trek vs. Margaret Atwood vs. Paul Krugman

The idea of a post-scarcity society made possible by technology has been a staple of science fiction and futuristic thinking. But as it has become easier to imagine it becoming reality, writers and economists have sketched out both optimistic and pessimistic visions of how society would handle the innovation that could enable this transition. The optimistic view often revolves around analogies to Star Trek's "replicator"; the pessimistic view

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[23] *See generally* YOCHAI BENKLER, THE WEALTH OF NETWORKS: HOW SOCIAL PRODUCTION TRANSFORMS MARKETS AND FREEDOM (Yale 2006).

[24] Tom Streithorst, *Post-Scarcity Economics*, L.A. Rev. Books, July 11, 2013, *available at* https://lareviewofbooks.org/essay/post-scarcity-economics.

can be seen in dystopian science fiction such as Margaret Atwood's Booker Prize-shortlisted *Oryx and Crake.*[25]

Almost a half-century ago, the renowned architect, author and inventor R. Buckminster Fuller argued that "[w]e must do away with the absolutely specious notion that everybody has to earn a living," since "one in ten thousand of us can make a technological breakthrough capable of supporting all the rest."[26] Perhaps the most common depiction is that of 24th century human society in the "Star Trek" television series and films; as the character Captain Jean Luc Picard states "the acquisition of wealth is no longer the driving force of our lives."[27] This optimistic view is compelling; in particular, the image of the Star Trek replicator has been magnetic for economic and legal commentators contemplating a possible post-scarcity future. For example, the economist J. Bradford DeLong has observed that while "[w]e don't yet have replicators, but we've progressed far beyond the conditions that made life nasty, brutish and short hundreds of years ago for all but the elite."[28] Similarly, Paul Krugman has contemplated the replicator's implications for economics:

> So, in Star Trek they have a replicator that can make any thing you want. But it makes any *thing* you want. Even now, we spend only 30 per cent of our income on goods the rest is for services, and the replicators won't help with that. We have fewer manufacturing workers but lots and lots of nurses, so. So that's the point. We can imagine a world where all services are provided as well. We have robots or something to do the services.[29]

While still nonexistent, the replicator itself has become a kind of totem for economists and others when thinking about what a post-scarcity society

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[25] MARGARET ATWOOD, ORYX AND CRAKE (Doubleday 2003).
[26] *See Coming to an Office Near You,* ECONOMIST, Jan. 18, 2014, *available at* http://www.economist.com/news/leaders/21594298-effect-todays-technology-tomorrows-jobs-will-be-immenseand-no-country-ready (quoting Fuller).
[27] Stephen Baxter, *The Cold Equations: Extraterrestrial Liberty in Science Fiction*, *in* THE MEANING OF LIBERTY BEYOND EARTH 26 (Charles S. Cockell ed., Springer 2007).
[28] *See* Rapoport, *supra* note 7.
[29] Izabella Kaminska, *You see, money doesn't exist in the 24th century*, FTALPHAVILLE, Oct. 12, 2015, http://ftalphaville.ft.com/2015/10/12/2142030/you-see-money-doesnt-exist-in-the-24th-century/.

would look like[30]; indeed, a popular line of 3D printer is sold under the name "Replicator."[31]

But not all views of such quantum technological change are optimistic. In her acclaimed dystopian novel *Oryx and Crake,* Margaret Atwood sketches much darker view of how society might assimilate dramatic changes in its technological ability. The world she sketches has dramatic technological capabilities – notably biotechnological – that are monopolized for the benefit of a very small subset of the world's population.[32] The economic structure leads to the deployment of technology largely in the service of positional goods involving personal appearance, and to resource crises outside the "charmed circle" – as well as disenchantment that leads to disaster.[33]

Besides economists and science fiction writers, the question of how society might embrace technological-driven abundance has drawn the attraction of another group necessarily charged with thinking about the future: Wall Street. The idea that new technologies are about to create a society of abundance that will look radically different from what we are used to has started to register on investment analysts' radar.[34] These analysts suggest that technologies such as artificial intelligence, Big Data, and the Internet of Things "all destroy existing systems and replace them with new ones" that will "increase living standards by lowering costs and improving quality."[35] While costs have been driven downward by technological change in the past, these analysts observe that the changes currently involved are more drastic than traditional innovation that lowered cost or improved quality; "[d]igital innovations in particular often provide products more conveniently and cheaply, but via substitution or the redistribution of sales

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[30]*See, e.g.,* Chinh H. Pham, *Could Star Trek's Replicator Become a Reality with 3D Printing Technology?*, NAT'L L. REV., Jan. 28, 2016, *available at* http://www.natlawreview.com/article/could-star-trek-s-replicator-become-reality-3d-printing-technology.

[31]Tony Hoffman, *Review: MakerBot Replicator Desktop 3D Printer*, PC MAGAZINE, Sept. 15, 2016, *available at* http://www.pcmag.com/article2/0,2817,2491092,00.asp (last visited Dec. 1, 2015) (reviewing latest edition of a leading model of 3d printer, named the "Replicator").

[32]*Id*.

[33]*Id.* For a similar view of technological benefit for the few in a society with overweening corporate power, *see also* CHANG-RAE LEE, ON SUCH A FULL SEA (Riverhead 2014).

[34]*See* Izabella Kaminska, *The mainstreaming of technological abundance thinking*, FTALPHAVILLE, Oct. 27, 2015, http://ftalphaville.ft.com/2015/10/27/2143173/the-mainstreaming-of-technological-abundance-thinking/ (observing that "[t]echno-utopianism is no longer the fringe view of some wildly over-optimistic guys at MIT" and that "[i]n the last two years, techno abundance has become a core investment thesis").

[35]Independent Strategy report, quoted in *id*.

rather than the creation of new incremental sales."[36] And indeed, the fact that financial markets value Uber more than General Motors and Airbnb more than Marriott Hotels suggests that investors agree that these are changes of a great magnitude.[37] As a result, such analysts view technological progress as having experienced a quantum change "akin to a supply shock" whereby "lower unit costs and heightened competition . . . ought to generate lower levels of consumer prices than might otherwise be the case."[38]

Nonetheless, these analysts have also recognized that a shift to a post-scarcity economy via technological abundance will not be without opponents. Incumbent firms now understand the challenge of disruptive innovation[39]; as a result, some analysts worry that "companies are playing defense and trying to protect existing profit pools in an innovation environment that is increasingly disruptive."[40] Indeed, this concern has driven a number of IP law commentators to consider what the move to post-scarcity means for IP-heavy industries – the next section focuses on their accounts.

B. Post-scarcity economics and the law

Among legal commentators, IP scholars have been particularly prescient at grappling with the possible emergence of a post-scarcity society. For IP, this was perhaps a natural development – at its core, the field confronts regimes of state power designed to create artificial scarcity for

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[36] Izabella Kaminska, *Disrupting FREEDOM!*, *in* BEYOND SCARCITY SERIES, FTALPHAVILLE, Feb. 11, 2015, *available at* http://ftalphaville.ft.com/2015/07/30/2135837/disrupting-freedom/ (quoting the Citi/Oxford Martin Report).

[37] Richard Reed, *Uber is Now Worth More than General Motors. Yes, really*, THE CHRISTIAN SCIENCE MONITOR, Dec. 7, 2015, *available at* http://www.csmonitor.com/Business/In-Gear/2015/1207/Uber-is-now-worth-more-than-General-Motors.-Yes-really (reporting "significantly higher" valuation); Rolfe Winkler and Douglas MacMillan, *The Secret Math of Airbnb's $24 Billion Valuation,* THE WALL STREET JOURNAL, Jun. 17, 2015, *available at* http://www.wsj.com/articles/the-secret-math-of-airbnbs-24-billion-valuation-1434568517 (reporting investors' higher valuation for Airbnb than Marriott).

[38] Izabella Kaminska, *Inflationistas and the global supply shock*, *in* BEYOND SCARCITY SERIES, FTALPHAVILLE, Jul. 30, 2015, http://ftalphaville.ft.com/2013/07/30/1585982/inflationistas-and-the-global-supply-shock/ (quoting the UBS' Global Economic Perspectives Report).

[39] *See generally* CLAYTON CHRISTENSEN, THE INNOVATOR'S DILEMMA: WHEN NEW TECHNOLOGIES CAUSE GREAT FIRMS TO FAIL (Harvard Bus. Rev. Press 1997).

[40] Kaminska, *supra* note 38 (quoting Citi/Oxford Martin report).

products such as books, software and pharmaceuticals, where the marginal cost of production may be quite low or zero, but the fixed or first-unit costs may be tremendous. Indeed, early inklings of post-scarcity thinking can be discerned in scholarship that addressed, for example, the shifting of trademarks' value from source identification to inherent worth as status goods because of state-enforced artificial scarcity.[41] This vein of IP scholarship has important implications for antitrust law. In particular, the trends these scholars identify in specific industries – drastic cost reductions coupled with incumbents' attempts to preserve their profitability with steps that sometimes hurt consumers – should challenge antitrust scholars also to rethink their existing approaches.

A significant, very recent literature has sprung up in which IP scholars have identified specific technological advances as the drivers of post-scarcity developments; these technologies include 3D printing, robotics, synthetic biology, and, adding value by knitting all of these together with users and producers, the ever-evolving Internet.[42] In particular, IP commentators have forecast 3D printing as enabling the Internet to challenge the fundamentals of patent law in the way that digitized content and file-sharing software upended copyright law and the music industry – as one article puts it: "Patents, Meet Napster."[43] 3D printing has drawn IP scholars' attention for several reasons. First, the possibility of a 3D printer in millions of private homes – much like the mass distribution of Internet-connected personal computers did with copyrighted music – conjures the spectre of "decentralized piracy" of protected physical objects.[44] Accordingly, enforcement becomes much more difficult. Second, 3D printing creates gaping loopholes in IP doctrine in places where they did not exist before, at least not to such a degree.[45] Finally, 3D printing may disrupt intellectual property protections that rely, not just on law, but on physical limits to prevent infringement.[46]

Besides 3D printing, several other technologies have drawn IP scholars to consider a post-scarcity world's impact on their field of study. First, synthetic biology may reduce the need for pharmaceutical patents. Mark Lemley raises the possibility that such technologies will one day enable

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[41]*See* Barton Beebe, *The Sumptuary Code*, 123 HARV. L. REV. 810 (2010).
[42]*See supra n*.11 (listing articles discussing existing and potential tensions between existing IP law and 3D printing).
[43]Desai and Magliocca, *supra* note 11 at 1691.
[44]Ben Depoorter, *Intellectual Property Infringements and 3D Printing: Decentralized Piracy,* 65 HASTINGS L. J. 1483, 1486 (2014) (warning of such "decentralized piracy").
[45]Grimmelman, *supra* note 11, at *696* (describing challenge 3D printing poses to copyright law's idea-expression dichotomy).
[46]Desai and Magliocca, *supra* note 11 at 1710.

doctor's offices to custom produce gene therapies.[47] Second, he posits that, as digital music did to copyright and 3D printing may do to patent law, advances in robotics may bring "disruption to the service economy."[48] In particular, he points out the transition from specific-purpose robots (such as in auto assembly) to general-purpose robots will allow robotic technology to advance with the speed of software, not hardware.[49] That is, general-purpose robots that can serve as generative platforms will allow owners to harness the shared creativity of the online world.

Indeed, as a kind of turbocharging factor, IP commentators point out that the connectivity enabled by the Internet makes technologies such as 3D printing, synthetic biology and robotics even more powerful. People worldwide can more easily share instructions, plans, recipes and the like for how to use these technologies.[50] Accordingly, both the fixed costs and marginal costs of employing these technologies may drop dramatically. The next section considers how changes in production costs may create a post-scarcity world.

C. Beyond IP – falling marginal and fixed costs of production

While IP scholars have created a recent lively discussion about a post-scarcity world, other commentators have assessed the post-scarcity paradigm's fit with the changing broader economy. Though these predictions can easily sound a bit like "pie in the sky," they are beginning to draw serious consideration. As Lemley writes

> [N]ew technologies promise to do for a variety of goods and even services what the Internet has already done for information . . . Combine the[] four developments – the Internet, 3D printing, robotics and synthetic biology – and it is entirely plausible to envision a not-too-distant world in which most things that people want can be downloaded and created on site for very little money . . .[51]

New York Times bestselling author Jeremy Rifkin has termed this "The Zero Marginal Cost Society" – despite the title, he also addresses falling fixed costs;

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[47]Lemley, *supra* note 11, at 479 (stating that "it is certainly possible to imagine a time in which every doctor's office can generate custom genes") (2015).
[48]*Id.*
[49]*Id.*
[50]*Id.*
[51]Lemley, *supra* note 11

similarly, in their Amazon bestseller *Abundance*, Peter H. Diamandis and Steven Kotler echo the theme of tech-driven progress eliminating scarcity.[52]

The argument that tech-driven abundance will lower marginal, that is, incremental per-unit, production cost is fairly straightforward. First, a larger, and growing, share of GDP derives from intellectual property, where low to zero marginal cost is common – think recorded music, books and pharmaceuticals. Second, transportation and distribution make up a significant chunk of marginal cost; these factors are decreasing as some products (think music and books) increasingly are distributed as electrons to an iPad rather than as hard products, and as distribution networks are made more efficient through Internet-enabled coordination (think Amazon). Finally, per-unit labor costs potentially also may decrease due to advances in robotics.

However, commentators also observe that technological change is driving this change by lowering not only marginal, but also fixed and first-unit, costs of production. Several examples illustrate this. First, IP scholars have noted how Internet-driven connectivity plus digital distribution have lowered the entry barrier to produce creative content. In short, aspiring journalists no longer need access to a printing press, and musicians have little to no need for a record press. Technological change has removed these initial fixed costs of production. Second, Rifkin argues that 3D printing reduces the need for large-scale manufacturing plants and mass collaborative production of software and designs, and breakthroughs in energy production all create a "new economic infrastructure."[53] As an illustration, Deven Desai points to the extreme difficulty of producing a working firearm at home prior to 3D printing – and the relative ease after.[54] Finally, increased interconnectivity and algorithmic processing can now replace hardwired communications infrastructure. Take for example, Uber: adding software to preexisting, general-use Internet-linked smartphones made it unnecessary

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[52]RIFKIN, *supra* note 11, at 11 (stating that "an economy based on scarcity is slowly giving way to an economy of abundance"); PETER H. DIAMANDIS & STEVEN KOTER, ABUNDANCE: THE FUTURE IS BETTER THAN YOU THINK 9 (Free Press 2012) (stating that "[a]bundance for all is actually within our grasp [though] [i]n this modern age of cynicism, many of us bridle in the face of such proclamation"). *See also* PHILIP SADLER, SUSTAINABLE GROWTH IN A POST-SCARCITY WORLD 7 (Gower 2010) (describing "[t]he world's most highly developed economies . . . [as] moving at an accelerating pace towards as state of post-scarcity, an age of abundance, a state in which an ever wider range of economic goods and services are available in abundant supply and at extremely low cost").

[53]*See* RIFKIN, *supra* note 11, at 45.

[54]*See* Deven Desai, *The New Steam: On Digitization, Decentralization and Disruption*, 65 HASTINGS L. J. 1469, 1473 (2014) (discussing how the legal situation that "under [existing] federal law, anyone can make a gun at home" takes on new significance in a world of home 3D printing).

that Uber invest in high fixed-cost taxi dispatching station and radio system, let alone a fleet of cabs.[55]

In fact, some industries are seeing tech-driven falls in both their marginal and fixed costs. The Apple/e-books antitrust case presents a good example.[56] The agreements between Apple and the major hardcopy book publishers concerning the latters' sale of e-books took place against the backdrop of a rapidly changing industry. Via its bookselling website, its Kindle e-book reading device, and its own publishing arm, Amazon was driving down the initial cost of producing the first copy of a book as well as the marginal cost of each additional unit. Note the lowering of fixed or initial-unit costs: no longer was access to a printing press required, and Amazon was developing systems that provided traditional publishers' curation and promotion functions at a lower cost. To a great degree, the agreements between Apple and the publishers were an attempt to bolster the hardcopy book market by slowing or rolling back the adoption of e-books.

As a result, even if technology is driving down fixed and marginal costs, that these forces will reach their full potential is not inevitable. Desai worries that "incumbents may seek new laws to protect their positions" from these technological driven disruptions, that "as soon as digitization offers a method of control, it will be exerted," and that "new oligopolies will emerge." The concern that the emergence of a post-scarcity economy will be thwarted by acts that incumbents find profitable, but that reduce social welfare, is what must force competition law to take notice.

III. A Competition Law Response?

> None of this, however will happen by itself or of its own accord. The system is not self-adjusting, and without purposive direction, it is incapable of translating our actual poverty into our potential plenty.
>
> –John Maynard Keynes[57]

> Our prosperity requires productivity growth: technological advances that continue to allow us to make goods and services more cheaply. Star Trek is the extrapolation of this trend. If it costs hardly anything to produce goods, then everyone can afford almost everything. . . . [But] [w]hat if the benefits of productivity gains are monopolized by the top one percent, as they largely have been for most of the past 30 years?
>
> –economics columnist Tom Streithorst[58]

[55] *See infra* Section IV.A.
[56] *See infra* Section III.A.
[57] Keynes, *supra* note 18, at 571.

Changes all around us – starting with IP, but reaching beyond – have led leading economists to consider the possibility of a post-scarcity society. Even if the post-scarcity shift does not take place across all sectors, and instead remains confined to a subset of industries, this shift would still be critical for antitrust law, whose analysis proceeds market-by-market and industry-by-industry. Moreover, technology-driven abundance is not inevitable, and countervailing forces may seek to thwart it to protect their own interests. In general, concerted actions aimed at anticompetitive means fall within the heartland of antitrust enforcement's focus. However, because of its retrenchment since the onset of the Chicago school – aimed at cabining antitrust's targets to a narrow set of horizontal restraints on price and output without any redeeming virtue – antitrust will require a shift in its attitude and energy. This section explains that some incumbents may choose to engage in what this Article terms "anti-disruption" in order to preserve profit margins against dramatic cost-reducing innovation – such conduct can be privately rational yet harmful to the . In doing so, it first presents the Apple/eBooks case as an example of anti-disruption, then proceeds to discuss the related implications of the trend towards post-scarcity for the antitrust analysis of efficiencies and essential facilities, respectively. The takeaway: antitrust must become more active to prevent the post-scarcity society from being smothered in its cradle.

A. Protecting Innovation by Preventing "Anti-disruption": the Apple/eBooks case as example

Once upon a time, whole industries – think music, broadcast television and newspapers – were blindsided by disruption. New, quantum-level cheaper forms of distribution undercut their business models and hollowed out their revenue sources – think Napster, Netflix and online news sites. But disruption is no longer such a bolt out of the blue. To be sure, the forces of technology-driven disruption continue to rage. But now, businesses striving to be the "Uber of X"[59] and the very existence of an annual "TechCrunch Disrupt" conference demonstrate that *disruption itself* is becoming a business model.[60] As a result, incumbents should be greatly less surprised to find

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[58]Streithorst, *supra* note 19 (continuing on to describe this as the world of Margaret Atwood's novel *Oryx and Crake*).

[59]*See* Abby Phillips, *'The Uber of' . . . You Name It*, WASH. POST, May 28, 2014, *available at* https://www.washingtonpost.com/news/post-nation/wp/2014/05/28/the-uber-of-you-name-it/ (last visited Jan. 21, 2016) (describing startups striving to become "Uber for snowplows" and "the Uber of laundry").

[60]*See* Christian Lang, *At the World Economic Forum, A Study of Disruption and its Discontents*, TECHCRUNCH, Jan. 20, 2016, http://techcrunch.com/2016/01/20/at-the-world-economic-forum-a-study-of-disruption-and-its-discontents/ (last visited Jan.

themselves in the crosshairs of the disrupters – and to take steps towards "anti-disruption."[61]

While there have been embryonic antitrust responses to anti-disruption in past,[62] probably the most prominent fully-formed example is *U.S.* v. *Apple*.[63] In *Apple,* the Antitrust Division brought suit against five major book publishing companies and Apple, Inc., alleging that they conspired to raise and fix the price for electronic books in violation of Sherman Act Section I.[64] While the publisher defendants settled the claims against them, Apple proceeded to lose at trial and on appeal; a certiorari petition is pending before the Supreme Court.[65] Apple's Supreme Court case turns on a question regarding the standard of review for vertical restraints – regardless

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21, 2016) (Techcrunch blog describing 2016 World Economic Forum in Davos' theme "The Fourth Industrial Revolution" as recognition of "the disruption happening everywhere today as part of a larger paradigm shift").

[61]*Id.* (describing the multifaceted response of SAP, IBM and global consulting firms as evidence that "[d]disruption is being co-opted").

[62]*See* John Wilke & Tristan Mabry, *Virtual Realty: Homestore.com Uses its Lock on Listings to Widen Realtor Net*, WALL ST. J., Aug. 6, 1999, at A1 (discussing home selling website's use of exclusive contracts with local realty boards to thwart rivals); Keith Regan, *Homestore.com Faces Antitrust Probe*, COMMERCE TIMES, Apr. 26, 2000, http://www.ecommercetimes.com/story/3133.html (last visited Feb. 1, 2016) (reporting U.S. Department of Justice Antitrust Division investigation into Homestore.com and the National Association of Realtors); Salil K. Mehra, *Information in an Antitrust Age,* 2000 U. CHI. L. FORUM 219, 241-42 (discussing implications of antitrust probe into realty industry's contracts with Homestore.com).

[63]*See* United States v. Apple, No. 13-3741 (2d. Cir., Jun. 30, 2015) (hereinafter *Apple II*); United States v. Apple, 952 F. Supp.2d 638 (S.D.N.Y. 2015) (hereinafter *Apple I*).

[64] Apple I, *supra* note 63*; Apple II*, *supra* note 63*.*

[65]Petition for Writ of Certiorari, Apple Inc., v. United States*,* No. 15-565 (U.S. Oct. 26, 2015), *available at* http://www.scotusblog.com/wp-content/uploads/2015/11/2015.10.28-Petition-for-Certiorari_149252037_1-2.pdf (last visited Jan. 20, 2016). The cert. petition turns on the appropriate standard for analyzing vertical restraints such as the contracts between Apple and its upstream suppliers (the book publishers) that is not central to the argument in this Article. It emphasizes the Supreme Court's decision in *Leegin* to contend that because Apple stands in vertical relationship to the other cartel participants, Apple's conduct cannot be reviewed under the *per se* rule; accordingly, the cert. petition echoes the dissent in *Apple II* in claiming that the majority's treatment contrary creates a circuit split with the Third Circuit's opinion in *Toledo Mack Sales & Service, Inc. v. Mack. Trucks, Inc*. (530 F.3d 204 (3d Cir. 2008)) (citing Leegin v. PSKS, Inc., 551 U.S. 877 (2007) and applying per se standard to claims involving the horizontal relationship as competitors between allegedly conspiring Mack Truck dealers but the rule of reason standard to claims involving the vertical supplier-distributor relationship of the parent Mack Truck company with its dealers).

of that appeal's outcome, the publishers' conduct in concert with Apple provide an example of anti-disruption.

In particular, the facts of *Apple* exemplify a concerted response by incumbents to disruptive innovation that lowered both fixed and marginal costs. While e-books had existed since the early 1970s, their adoption grew rapidly in the early 21st century due to Internet distribution and increasingly useful e-readers using E-Ink, a paper-like display technology invented in the late 1990s at MIT, and incorporated first in the Motorola F3 e-reader in 2006.[66] Although Amazon invented neither E-Ink nor the e-reader, the marriage of its successful bookselling website to its Kindle e-reader, drove the rapid adoption of e-books. For consumers, e-books are potentially a tremendous boon. They make possible the significant reduction of both fixed costs (no investment in printing presses, for example) as well as marginal costs (considerably cheaper distribution and no per-copy printing and binding costs). This was not a welcome development for the major book publishers, who saw the increasing sales of e-books cannibalize their profitable market for hardback books, but who could not risk alienating Amazon, the largest bookseller on Earth, by refusing to sell e-books. As a result, the traditional book publishers allegedly conspired with Apple, upon the launch of the iPad, to raise the prices of e-books. For the publishers, this was driven by a desire to "anti-disrupt" the threat of e-books to their existing business model.

At a deeper level, the *Apple* case suggests a need for antitrust enforcement: incumbents now understand Internet-driven disruption and face a strong incentive to take exclusionary steps to prevent it to protect their existing positions. Indeed, such efforts may be seen in the context of music downloads[67] and allegedly, by Broadband Internet and cable incumbents to thwart video streaming firms such as Netflix.[68] Where they currently enjoy oligopoly or monopoly rents, that incentive for incumbents

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[66] LAURA LAMBERT, 1 THE INTERNET: A HISTORICAL ENCYCLOPEDIA – BIOGRAPHIES 83-84 (Hillary W. Poole ed., ABC-CLIO 2005) (describing the beginnings of e-books to Project Gutenberg in 1971, and discussing the impact of E-Ink).

[67] Alexa Klebanow & Tim Wu, *Is Music the Next eBooks? An Antitrust Analysis of Apple's Conduct in the Music Industry*, __ COLUM. J. L. & ARTS __ (forthcoming 2016) *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2633751 (last visited Jan. 31, 2015) (positing that Apple may be protecting its position in the music download business versus insurgent streaming services by using exclusionary conduct that may violate the antitrust laws).

[68] *See* Susan Crawford, *How to Fight Telecom Gameplaying*, BACKCHANNEL, Oct. 30, 2014, https://medium.com/backchannel/how-to-fight-telecom-gameplaying-aa3765edc385#.kmz8finex (last visited Dec. 20, 2015) (arguing that the FCC "needs to create rules for interconnection deals between the terminating monopolies [such as Comcast and Verizon, who control the connection that terminates at the user's home] and everyone else" such as Netflix and other services).

will be even stronger. Scott Hemphill and Tim Wu have argued for the recognition of an antitrust violation they term "parallel exclusion" – that is the concerted conduct by multiple firms that blocks or slows market entrants.[69] Consideration of concerted anti-disruption would be driven by a heightened form of exclusion, one in which quantum leaps in cost reduction through innovation are prevented and deterred, with potentially disastrous effects on overall welfare.

To be sure, *Apple*, in which each of the three judges on the Second Circuit panel wrote an opinion, suggests some key challenges for treating anti-disruption as an antitrust violation. Specifically, the opinions highlight problems for judges in dealing with markets with rapidly falling costs, in comprehending competition that extends beyond big incumbent players, and in understanding the incentives for dominant incumbents to engage in anti-disruption. These problems and the high cost of false negatives in this context – the inhibiting by market incumbents of a move towards a post-scarcity world – requires a rethinking of how antitrust enforcement should proceed.

Reforming antitrust enforcement to promote a transition to a post-scarcity world will not be easy. First, the Second Circuit's majority opinion in *Apple* and the contrast with the dissent suggest that courts may struggle to accurately weigh the importance of falling fixed and marginal costs, particularly where the extent to which they will fall is uncertain. *Apple* shows that courts currently working under the industrial age antitrust paradigm struggle to give appropriate weight to the value of falling fixed and marginal costs. As noted in prior sections, to the extent antitrust has grappled with cost reductions, it has done so in contexts involving mergers and joint ventures. And in these contexts it has often struggled, for the simple reason that enforcement officials and judges must make a prediction based on efficiency arguments that may be difficult to prove.[70] And indeed, the *Apple* case illustrates the indeterminacy of these arguments. The majority opinion leads off from its first paragraph with the observation that while the printing press had been a constant of book publishing for centuries, e-books "had the potential to change the centuries-old process for producing books by eliminating the need to print, bind, ship, and store them."[71] The majority then goes on to note the impact of falling costs several more times,[72] as well as the publisher defendants' interest in preserving their higher-cost – but also higher-priced and higher-profit – hardcover book sales from the

[69]C. Scott Hemphill & Tim Wu, *Parallel Exclusion*, 122 YALE L. J. 1182 (2013).
[70]*See* Daniel A. Crane, *Rethinking Merger Efficiencies,* 110 MICH. L. REV. 374 (2011) (considering impact of argument that "efficiencies are difficult to prove").
[71]*Apple II,* slip op. at 4.
[72]*Apple II,* slip op. at 12, 68, and 89.

cost- and price-reducing impact of e-books' development.[73] By contrast, the dissent at no point discusses the cost reduction impact through innovation that e-books represent.[74] However, it would be unfair to suggest that the dissenting opinion has no appreciation for innovation; Chief Judge Jacobs cites the impact of the iPad (without demonstrating that it could not have been successfully launched without cartelizing e-books) as justification for Apple's participation in a price fixing cartel.[75] Understandably, it is easier to appreciate the effects of innovation when they come in a shiny, tangible package than when they represent the intangible economic boon of mass reading without the fixed- and marginal-cost investments in a press for the first time since the Chinese invented movable type a millennium ago.

Second, *Apple* illustrates the danger that judges may erroneously hold onto a static paradigm in which competition takes place between powerful incumbents; in particular, the dissent in *Apple* lets a picture of a battle between Apple and Amazon hold it captive – ignoring the backdrop of innovation and massive cost reduction that impacts not just competitors, but competition.[76] The contrast between the majority opinion and the dissent in the *Apple* case demonstrates the danger of an emphasis on existing incumbents in static world. While the iPad was a new product, both Apple and Amazon were huge and valuable firms with a strong presence both online (iTunes/App Store and Amazon.com) and in hardware (the iPhone/iPod/Mac desktops and the Kindle, respectively).[77] Indeed, the majority opinion castigates the dissent for too easily assuming that adding the iPad to the marketplace even required, let alone justified, the cartelization of publishers to throttle a transformative technology in the form of e-books.[78] In part, the tension between the two opinions reflects a

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[73] *Apple II,* slip op. at 14-17, 85, 122, and 125.

[74]The dissenting opinion by Chief Justice Jacobs does discuss cost repeatedly to suggest that Amazon – which was not a party to the case and so did not have the opportunity to litigate the facts nor legal allegations of predatory pricing concerning it – was selling below cost in a manner that he describes as "predatory" from the standpoint of the defendants. *Apple II,* slip op. at 6 (Jacobs, C.J, dissenting).

[75]*Apple II*, slip op., p.30.

[76]LUDWIG WITTGENSTEIN, PHILOSOPHICAL INVESTIGATIONS 129 (4th ed., Wiley-Blackwell 2019) ("A picture held us captive. And we could not get outside it, for it lay in our language and language seemed to repeat it to us inexorably.").

[77]Apple has at times in recent years been the most valuable corporation in America (market captalization). Jen Wieczner, FORTUNE, Feb. 3, 2016, *available at* http://fortune.com/2016/02/03/apple-facebook-amazon-google/. Amazon has entered the top dozen, and is the most valuable retailer in America. Paul R. La Monica, CNN/MONEY, Jul. 24, 2015, *available at* http://money.cnn.com/2015/07/24/investing/amazon-worth-more-than-walmart/.

[78]*Apple II*, slip op. at 9 ("the dissent's armchair analysis wrongly treats the number of ebook retailers at any moment in the emergence of a new and transformative

different appreciation of the dynamic effects of emergent technology versus vigorous competition between incumbent industry leaders. In the dissent's view, "Apple took steps to compete with a monopolist" – that is, allegedly, Amazon.[79] In particular, Chief Judge Jacobs, who has written elsewhere about the implicit biases of judges,[80] accuses of colleagues as making "the implicit assumption that competition should be genteel, lawyer-designed, and fair under sporting rules."[81] However, he himself seems to be suffering from the cognitive error of status quo bias; by reifying the interest of big industry players like Amazon and Apple without considering the value of e-books themselves as a rapidly emergent technological product that benefits consumers, he performs an antitrust analysis that is, at best, incomplete, and at worst, unmoored from the anchor of American antitrust: consumer welfare.[82]

Finally, forces both within and without the legal system will tend to support rulings that would sacrifice the benefits of a post-scarcity society in favor of smaller gains to powerful private interests. The *Apple* case illustrates the incentive for incumbents to prevent the transition to a post-scarcity society. These acts go beyond mere counter-disintermediation – they are not merely seeking to preserve a buy-sell price spread for wholesalers, brokers and other intermediaries. Both the dissent in *U.S.* v. *Apple* and the mass media coverage of the case provide strong examples of a willingness to sacrifice potentially massive public gain due to falling fixed and marginal costs in order to preserve private benefits to favored firms.

In effect, the dissent would immunize Apple's role in a cartel that thwarts the transition to lower fixed and marginal costs for the reading public. The dissenting opinion turns on two points of contention with the majority. The dissent's second major mistake was to conclude that Apple's

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technology for book distribution as the sine qua non of competition in the market for trade ebooks").

[79]*Apple II,* slip op. at 34 (Jacobs, C.J., dissenting).

[80]Dennis Jacobs, *The Secret Life of Judges,* 75 FORDHAM L. REV. 2855, 2855 (2007) (describing "the judge's inbred preference for outcomes controlled by proceduralism, the adversary system, hearings and experts, representation by lawyers, ramified complexity of doctrines and rules, multiple prongs, and all things that need and use lawyers, enrich them, and empower them vis-a-vis other sources of power and wisdom").

[81]*Apple II,* slip op. at 5 (Jacobs, C.J., dissenting).

[82]Joshua D. Wright & Douglas H. Ginsburg, *The Goals of Antitrust: Welfare Trumps Choice*, 81 FORDHAM L. REV. 2405, 2406 (2013) (stating that "[t]he promotion of economic welfare as the lodestar of antitrust laws . . . transformed the state of the law and restored intellectual coherence to a body of law Robert Bork had famously described as paradoxical" and that "there is now widespread agreement that this evolution toward welfare and away from noneconomic considerations has benefitted consumers and the economy more broadly").

role in undermining a claimed (but unadjudicated) monopoly – whose bare existence, unlike the act of monopolization, has long been held legal[83] – could offset liability for its participation in a horizontal price fixing conspiracy.[84] Neither precedent nor prominent commentary supports this view. The Court in *Trinko* made clear that the Sherman Act "seeks merely to prevent unlawful monopolization" and does not go so far as "to eliminate the monopolies" that firms might otherwise enjoy[85]; by contrast, the Sherman Act has long been held to prohibit price fixing.[86] And as Herbert Hovenkamp, the single most prominent commentator in antitrust, has long pointed out, it makes good sense to treat price fixing more harshly than monopolization for a number of reasons, not least of which is the relative speed and ease of making an anticompetitive multifirm agreement relative to building and maintaining a long-lasting single-firm monopoly.[87] As a result, a judge-granted plenary indulgence for price fixing due to contributions that erode a monopoly makes little sense.

However, it would be wrong to conclude that the inclination to misread an antitrust case in a manner that favors and insulates powerful incumbent firms can only be found in conservative judges. The *Apple* case drew heavy coverage from media outlets critical of the Justice Department's decision to bring the case and especially, of Amazon's price-dropping effects on e-books, and by extension, the overall book market. In particular, *The New Yorker* magazine, notable for many things but not generally for antitrust commentary, had four separate articles on the case and the events

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[83] *See* United States v. Alcoa, 148 F.2d 416, 429 (2d. Cir. 1945) (Hand, C.J.) (stating that "[i]t does not follow [that] because 'Alcoa' had [] a monopoly, that it 'monopolized'" in violation of Section 2 of the Sherman Act, since "monopoly may have been thrust upon it" via "accident" or "superior skill, foresight and industry").

[84] *Apple II,* slip op. at 6, (Jacobs, J. dissenting).

[85] Verizon Communications Inc., v. Law Offices of Curtis V. Trinko, LLP, No. 02-682, 16 (U.S. 2004), *available at* http://www.supremecourt.gov/opinions/03pdf/02-682.pdf (Scalia, J.).

[86] *See* United States v. Trenton Potteries, 273 U.S. 392 (1927) (applying Section 1 and per se rule to price fixing agreement).

[87] HERBERT HOVENKAMP, FEDERAL ANTITRUST POLICY: THE LAW OF COMPETITION AND ITS PRACTICE §5.1b (Hornbook 2005) (multilateral activity deserves closer antitrust scrutiny because: 1) Sherman Act text, 2) "agreements creating significant market power can be formed very quickly" while "[m]ost firms do not become monopolists overnight" since "[r]ivals can generally be expected to resist a single firm's attempts to dominate its market" by contrast for monopoly through agreement, "[r]esistance is much less because the agreement creates market power by bringing firms into the venture rather than excluding them from the market," 3) monopoly alone is not illegal even though it restricts output, while agreements between competitors we consider lower output vs. increased efficiency and greater output, and 4) courts' ability to fashion relief (contrast forced reas rate sharing by single firm Amex vs. simply enjoining rate fixing by Visa organization)).

surrounding it, each of which contained significant criticism of or concern regarding Amazon – who was not a party.[88]

B. The declining importance of efficiencies in a decreasing-cost world

As the possibility of a post-scarcity society comes into view, antitrust must take a more skeptical view of efficiency arguments proffered in defense of private restraints. Such arguments attempt to justify the risk of increased market power by pointing to offsetting efficiency gains that the restraint helps achieve; the most common example is to ascribe potential production cost savings to the restraint. Antitrust law should look more skeptically at such arguments because, all things being equal, as the economy moves closer to zero-cost production, any gains from reduced production must become increasingly skimpy relative to the possible enhanced market power. And, importantly, antitrust authorities must consider the possibility, that alleged cost reductions and market power enhancement from the current baseline do not match the true potential in an economy capable of developing a post-scarcity society because artificial scarcity may be "baked in" by existing, distortive restraints.[89] While such arguments originated in the merger

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[88]*See* Vauhini Vara, *Did Apple Fix Prices for the Greater Good?*, NEW YORKER, Dec. 16, 2014, *available at* http://www.newyorker.com/business/currency/apple-claiming-virtue-e-book-price-fixing-case (last visited Jul. 8, 2015) (considering argument that Apple's role as participant in and/or facilitator of horizontal cartel was justifiable due to Amazon's theoretical role as an e-book monopolist, which has not been litigated or adjudicated); Matt Buchanan, *The e-Book Conspiracy Comes to a Close,* NEW YORKER, Jul. 11, 2013, *available at* http://www.newyorker.com/tech/elements/the-e-book-conspiracy-comes-to-a-close (last visited Jul. 8, 2015) (emphasizing in first paragraph that a "major beneficiary of the decision, Amazon, is not only one of the largest, most influential companies in technology but also the dominant company in bookselling"); Ken Auletta, *Paper Trail,* NEW YORKER, June 12, 2012, *available at* http://www.newyorker.com/magazine/2012/06/25/paper-trail-2 (last visited Jul. 8, 2015) (print edition) (observing that "The D.O.J. could have chosen not to bring" the case against Apple and the book publishers, and stating that "Amazon is already using its position in the market to intimidate less powerful publishers" and reporting anonymous source quote from "small publisher" that "Amazon is using its monopoly power to dictate to these companies that they will continue to discount our books below cost"); Ken Auletta, *Publish or Perish: Can the iPad Topple the Kindle, and Save the Book Business?*, NEW YORKER, Apr. 26, 2010, *available at* http://www.newyorker.com/magazine/2010/04/26/publish-or-perish (last visited Jul. 8, 2015)(reporting that "[m]any publishers believe that Amazon looks upon books as just another commodity to sell as cheaply as possible, and that it sees publishers as dispensable" and describing joint withholding of e-books from Amazon by publishers without any discussion of potential liability for collusion).

[89]This problem is analogous to dealing with the so-called "Cellophane Fallacy" in antitrust law, named after *United States* v. *DuPont,* (351 U.S. 377 (1956)), in which the Court had to consider whether cellophane was a separate product, or competed

review context, analogous arguments, though they often go by other names, are also found in order to justify agreements that otherwise might restrain trade in the Sherman Act Section 1 context (ancillary procompetitive justifications) and exclusionary conduct in the Section 2 context (legitimate business justifications). [90]

Antitrust analysis' trade-off between economies or efficiencies on the one hand and increased market power on the other is perhaps most closely associated with the work of Nobel laureate Oliver Williamson.[91] He recognized that where "a merger (or other combination) is proposed that yields economies [or efficiencies] but at the same time increases market power . . . then a rational treatment of the merger question requires that an effort be made to establish" the relative effects of the efficiencies versus the "market power effects."[92] With a simple model that continues to have significant persuasive power in American antitrust circles, Williamson pointed out that, under normal assumptions, the decrease in the marginal cost of production will swamp the market power effects – the implication being that enforcers should take efficiency defenses quite seriously.[93] The reason for this can be seen in Figure 1 – the triangle (red) representing the deadweight loss due to transactions no longer taking place at the new, higher price due to enhanced market power will tend to be smaller than the rectangle (blue) representing efficiency gains – most typically a lowered production cost (or alternatively, a qualitatively better product at the same

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with other flexible wrapping materials. While the Court applied questions of product substitution that are still in use today, it did so without considering whether the possibility that cellophane was being sold at monopolistically high prices was causing buyers to substitute with other flexible wrapping materials when they would not do so if the products were all sold in competitive markets. The failure to consider this "baked-in" price elevation has been called the Cellophane Fallacy, and less commonly, the Gingerbread Paradox. *See* George W. Stocking & Willard F. Mueller, *The Cellophane Case and the New Competition*, 45 AM. ECON. REV. 29 (introducing the concept); *see also* Mark A. Lemley & Mark McKenna, *Is Pepsi Really a Substitute for Coke? Market Definition in Antitrust and IP,* 100 GEO. L. J. 2055, 2089 (2012) (applying concept of Cellophane Fallacy to questions of IP and market power).

[90] *See* C. Scott Hemphill, *Less Restrictive Alternatives in Antitrust Law*, __ COLUM. L. REV. __ (forthcoming 2016) (discussing in parallel similar approaches to restraints with both positive and negative effects on competition in contexts involving Sherman Act Section 1 multifirm restraints and Section 2 single-firm monopolization).

[91] *See* Oliver E. Williamson, *Economies as an Antitrust Defense: The Welfare Tradeoffs*, 58 AMER. ECON. REV. 18 (1968).

[92] *Id.* at 18-19.

[93] *Id.* at 23 (concluding that his model shows that "generally it is evident that a relatively modest cost reduction is usually sufficient to offset relatively large price increases" and so "supports the following proposition: a merger which yields non trivial real economies must produce substantial market power and result in relative large price increases for the net allocative effects to be negative").

cost as before).[94] The same logic is used in considering restraints with positive and negative effects on competition under both Section 1 and Section 2 of the Sherman Act.[95]

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[94]In Willliamson's simple model, he showed mathematically why this is so. A merger or other transaction or restraint would on balance improve social welfare when the cost reduction effects (the blue rectangle in Figure 1) are greater than the deadweight loss (the red triangle in Figure 1).

The rectangle's area is $(AC_1 - AC_2)\ Q_2$ and the triangle's area is approximately (approximately because the demand curve would likely not actually be linear) $\frac{1}{2}(P_2 - P_1)(Q_1 - Q_2)$, since a triangle's area is half of the base times the height.

Thus the transaction will be welfare-enhancing if:
$(\Delta AC)(Q_2) > \frac{1}{2}(\Delta P)(\Delta Q)$

Dividing through by Q_2:
$\Delta AC > \frac{1}{2}(\Delta P)(\Delta Q)/Q_2$

Substituting for $(\Delta Q)/Q_2$ the expression $\mu\ (\Delta P/P)$ where μ is the elasticity of demand (a measure of how much the quantity consumed changes relative to a change in price, that is, $\mu = (\Delta Q/Q) / (\Delta P/P)$):
$(\Delta AC) > \frac{1}{2}(\Delta P)(\mu\ (\Delta P/P))$

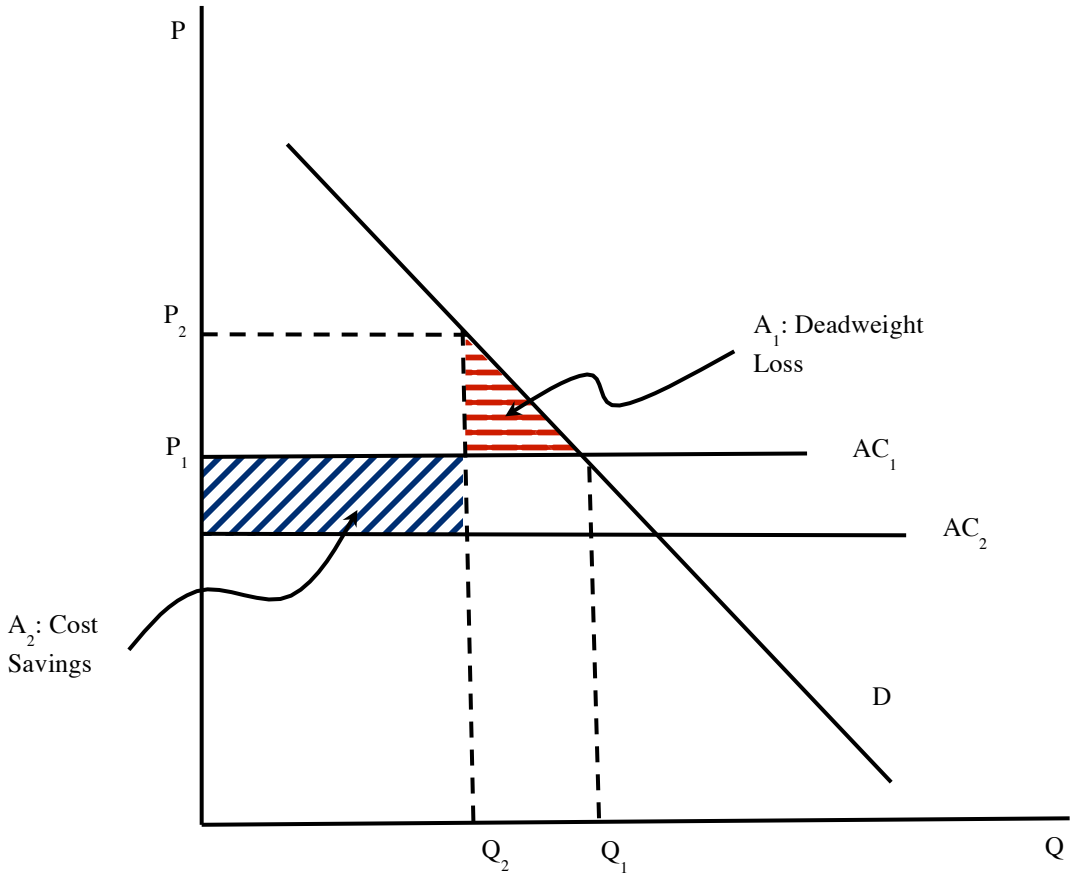
Dividing through by k, an index of market power at the start such that P = k(AC), and which is greater than or equal to 1, and which equals 1 in a perfectly competitive market where competition forces prices down to production cost:
$(\Delta AC) / (k)(AC) > \frac{1}{2}(\Delta P)(\mu\ (\Delta P/P))/P$

Simplifying:
$(\Delta AC) / (AC) > \frac{1}{2}(k)\ \mu\ (\Delta P/P)^2$

Meaning that, where is no preexisting market power (that is, k = 1), for example, a 20% increase in price due to increased market power after the transaction will be offset by a mere 2% reduction in production cost where $\mu = 1$ (that is, the quantity consumed changes – in the opposite direction - by the same percentage as the change in price). The implication is that fairly small cost reductions will outweigh fairly large price increases.
Id. at 18-19.

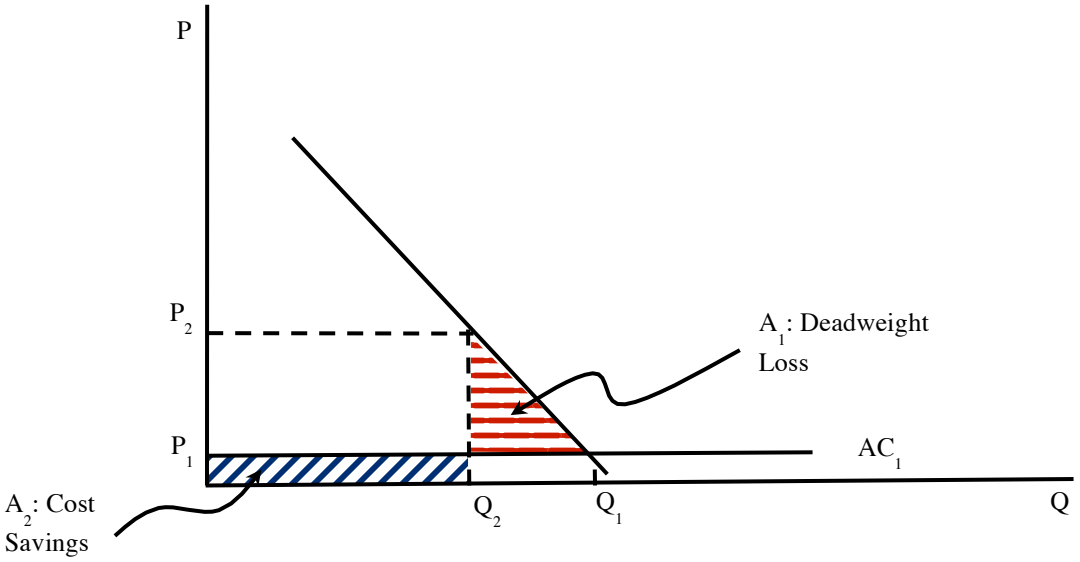
[95]*See* HOVENKAMP, FEDERAL ANTITRUST POLICY (4th ed., 2011) §§ 5.6b, 6.4a (discussing such tradeoffs in the context of both Sections 1 and 2).

Figure 1



Technologically-driven abundance has an important implication for this model: as marginal costs of production approach zero, all other things being equal, the anticompetitive market power effects' importance should increase relative to the procompetitive efficiency effects. This is true for two reasons. First, as shown in Figure 2, which is identical to Figure 1 except for the fact that the original price (P1) is far closer to the zero-price horizontal axis, as costs approach zero, the same price and output effects will generate relatively less offsetting efficiency relative to the deadweight loss – that is, all things being equal, the red triangle will be bigger compared to the blue rectangle. Second, consider what happens if the demand curve is as usually assumed and flattens asymptotically along the x-axis as price goes to zero.

Figure 2

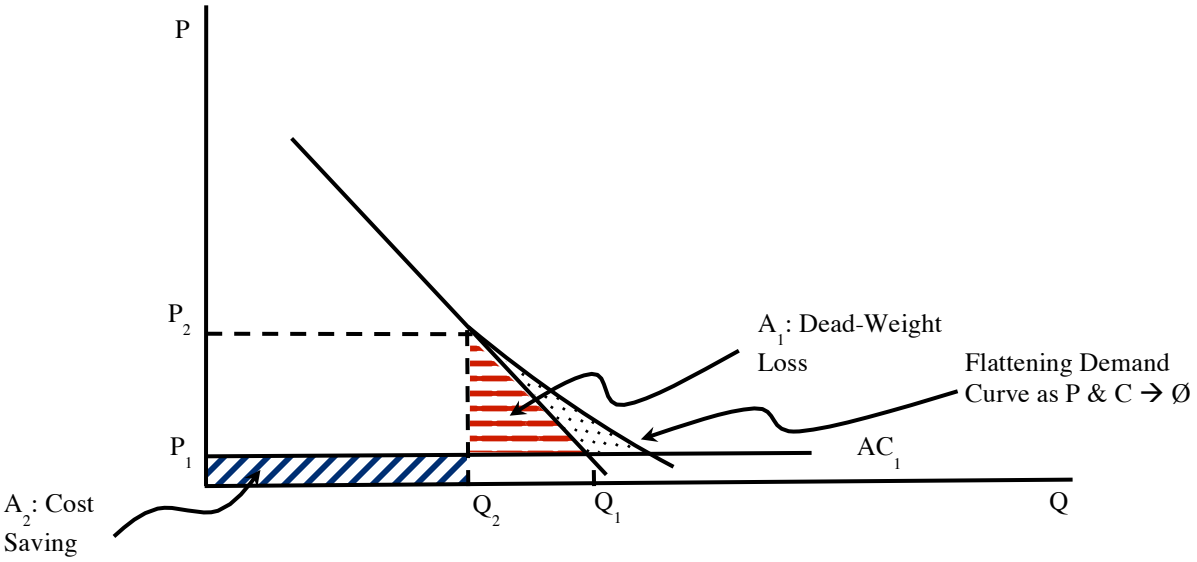


This is a common and normal assumption, seen for example in the case of unitary elasticity of demand, that is, where a 1% increase in price yields a 1% decrease in quantity demanded. [96] Again, all things being equal, as shown by Figure 3, which is identical to Figure 2 except for the addition of the flattening demand curve that approaches the zero-price horizontal axis asymptotically, the deadweight loss triangle will actually be bigger than it would have been at higher price and cost levels (the dotted area represents the increase in deadweight loss due to flattening of the demand curve as price and cost approach zero). This is because, holding the price change constant as simply a function of increased market power (the height of the triangle), the change in quantity (the triangle's base), representing the volume of lost transactions, increases.[97] As a result, the transition to a post-scarcity economy raises some critical questions about one of the driving models in contemporary antitrust law.

[96] *See, e.g.*, JOHN CREEDY, DEMAND AND EXCHANGE IN ECONOMIC ANALYSIS 34 (Elgar 1992) (stating that "a constant unit elasticity implies that the demand curve is a rectangular parabola [that is, a parabola whose asymptotes are perpendicular, in this case being the X and Y axes of price and quantity]").

[97] An important caveat is that an incipient post-scarcity economy might yield different parameters for elasticity or differently shaped demand curves; we cannot yet determine empirically if that is so.

Figure 3



As a result, an economy capable of achieving post-scarcity conditions demands a much more critical approach to efficiency defenses. There is some debate, both normative and positive, over how much weight antitrust enforcers should and currently do give to efficiency defenses.[98] Some commentators argue that American antitrust enforcers should be willing to permit, for example, mergers that benefit producers more than they hurt consumers, even where the benefits are not redistributed via market competition to make both groups better off.[99] Others argue that, in various ways, American antitrust enforcers already apply a total welfare standard,[100] or account for the difference between total welfare and consumer welfare via

[98] *See* Crane, *supra* note 70 (arguing for enhanced consideration of efficiency defenses in merger analysis).

[99] These commentators argue that the United States should, like Canada, explicitly adopt a "total welfare" standard rather than a consumer welfare standard. *See* Roger D. Blair & D. Daniel Sokol, *The Rule of Reason and the Goals of Antitrust: An Economic Approach*, 78 ANTITRUST L. J. 471 (2012) (arguing that, e.g., the rule of reason should be applied as a total welfare analysis rather than solely a consumer welfare analysis); Kenneth Heyer, *Consumer Welfare and the Legacy of Robert Bork*, 57 J. L. & ECON. 519 (2014) (explaining that Robert Bork, though using the term "consumer welfare," was actually advocating a total welfare standard).

[100] *See* Alan J. Meese, *Debunking the Purchaser Welfare Account of Section 2 of the Sherman Act: How Harvard Brought Us a Total Welfare Standard and Why We Should Keep It*, 85 N.Y.U. L. REV. 659 (2010) (arguing that, in Section 2 cases, courts have been using a total welfare approach not a purchaser welfare approach as other scholars believe).

a "rough justice" approach.[101] Essentially, the differences come down to "is" as well as "ought" arguments about whether Pareto or Kaldor-Hicks efficiency for consumers and producers, each separately aggregated as a unit, is the right standard[102] – the issue is whether it matters if the remaining market competition is sufficient that it could generate compensation to consumers via lowering prices enough to make up for the deadweight loss that consumers would otherwise suffer. These arguments have raged fairly prominently in the antitrust community this century.[103]

An important implication of a move towards post-scarcity is that existing antitrust debates about total welfare as a standards (that is, balancing cost-reduction benefits to producers with harms to consumers) versus focusing solely on consumer welfare increasingly become obsolete. This is because to the extent that production costs approach zero, lowering marginal cost becomes much less important relative to market power effects, whether the decrease in marginal cost would be passed on to consumers in the form of lower prices or not. That is, as possible cost reductions become smaller and smaller, the question of whether they offset harm to consumers tends to become moot. This is crucial, because this type of balancing analysis extends beyond the merger context, and in fact ranges across antitrust law. While most prominent in merger review, the analysis of Section 1 restraints among multiple parties and Section 2 single-firm monopolization both involve the question of offsetting procompetitive gains. We can see clear examples in many cases involving media, intellectual property and innovation. For example, in landmark Section 1 cases such as *NCAA v. Oklahoma*[104] and *Broadcast Music v. CBS,*[105] the Supreme Court squarely addressed the question whether agreements among competitors to restrict output and price could be justified by countervailing gains in efficiency and productive capacity. In *United States* v. *Microsoft*, in its monopolization discussion the en banc D.C. Circuit directly addressed the possibility of legitimate business justifications that would preclude liability for otherwise

[101]*See* Crane, *supra* note 70, at 364-365 (speculating that antitrust regulators may in practice be implementing an approach advocated in the past by Profs. Fisher and Lande to "liberalize merger policy overall" to make up for the fact that merger-justifying efficiencies exist, but "are hard to detect on a case-by-case basis"); *see also* Alan A. Fisher & Robert H. Lande, *Efficiency Considerations in Merger Enforcement,* 71 CAL. L. REV. 1580, 1651-68 (1983) (advocating this approach).

[102]Consumers taken as a unit and producers taken as a unit, since, for example, those consumers who suffer the deadweight loss due to a merger will not necessarily be the same ones who might enjoy lower prices because the merger lowers marginal cost and competition forces some of that efficiency gain to be passed on to consumers.

[103]*See supra* nn.104-107 (listing and describing leading articles in this debate).

[104]NCAA v. Oklahoma, 468 U.S. 85, 105-107 (1984).

[105]Broadcast Music, Inc. v. CBS, Inc., 441 U.S. 1, 20-21 (1979).

actionable predatory or exclusionary conduct.[106] In both contexts, the standard requires courts to balance the procompetitive benefits against the anticompetitive harms. Because the most commonly asserted – and most important – procompetitive benefits revolve around reducing cost and increasing productive capacity, as costs fall towards zero, this balance will shift against defendants, all things being equal.

Importantly, antitrust courts will have to reconsider efficiencies based not only on the current state of the market in the cases directly before them, but will also have to ask whether, were the current market a competitive one, the proffered efficiency defenses would not matter. As in the *DuPont* (Cellophane) case, the question is not only about market behavior at the current price level – courts must avoid the "Cellophane fallacy" of assuming that the current price level is competitive and refrain from concluding that because products are currently substitutes, they would also be substitutes at a competitive price level.[107] Similarly, and this will no doubt be a difficult inquiry, courts in an economy with the capacity to generate a post-scarcity society will have to ask whether the pro-competitive benefits of a merger or restraint are in part the result of preexisting anticompetitive practices or conduct. For example, if a merger reduces cost below the pre-merger state, but creates concentration that may tend to thwart the drive toward a reachable zero-marginal cost state, that would be a harm worth weighing. This kind of assessment will likely be quite difficult, but as in the *DuPont* case, it may be critical to properly understanding a market.

In all three contexts – merger review, Section 1 (multi-firm conduct) and Section 2 (single-firm conduct) – antitrust will have to consider decreasing its emphasis on efficiency defenses. That in itself may actually simplify antitrust analysis, since it suggests at some level cost-reducing efficiencies will matter less, reducing the factors a court must consider or regulate.

C. Post-scarcity and the essential facilities doctrine

An economy with the potential to generate a post-scarcity society also will require American courts to reconsider the essential facilities doctrine. While versions of essential facilities have been adopted in the competition

[106]United States v. Microsoft, 253 F.3d 34, 59 (D.C. Cir. 2001).
[107] *See supra* n.89 and surrounding text.

law of the European Union and elsewhere,[108] the United States Supreme Court, if not foreclosing it outright, has at least kept a wary distance.[109] But post-scarcity economics undermines the three main arguments against adopting the essential facilities doctrine.

In particular, the technologies driving post-scarcity economics undercut the strongest argument against essential facilities: that it weakens incentives to make competitive investments, since dominant firms would not, for example, build infrastructure or invent new technology lest a court appropriate the investment for a competitor's use. However, in the face of technological abundance, incumbents' desire to exclude will not necessarily hinge on whether they themselves created the disruptive technology. For example, in the Apple/e-books case, Apple and the publisher defendants who constructed a group boycott had invented neither e-books nor e-readers such as the Nook or Kindle. Increasingly, essential facilities arguments may take place against such a factual backdrop, in which a number of firms provide a necessary element of a sufficient set ("NESS") to create a breakthrough innovation – as opposed to the paradigm Justice Scalia described in the Supreme Court's leading case on the doctrine, *United States* v. *Trinko* , in which an essential facility was largely the product of a single durable monopoly.[110] Rewarding a firm that extracts monopoly rents in a NESS situation due to its use of deception, government lobbying, or strategic holdup does not promote the development of an essential facility in the pro-innovation manner pointed out in *Trinko*. And the sheer desire of a firm to recoup investment cannot, without more, justify exclusion; helping private firms recover stranded costs cannot and should not be an antitrust function. Instead, an essential facilities approach that builds, for example, of the injury-to-innovation limitation proposed by Christina Bohannon and Herbert Hovenkamp,[111] justifying exclusion and rejecting the doctrine only where the defendant actually created the cost-reducing disruptive technology they seek

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[108]*See, e.g.*, Case-C-418/01, IMS Health GmbH & Co. OHG v. NDC Health GmbH & Co. KG, 2004 E.C.R, I-05039, OJ C 118.30.04.2004 (2004) (decision of the European Court of Justice); Draft Regulations of China's Administration for Industry and Commerce on the Prohibition of Abuse of Intellectual Property Rights to Eliminate or Restrict Competition ('AML Enforcement Rules in IP' or 'the rules'), *available at* http://chinaipr2.files.wordpress.com/2014/07/aba-sal-sipl-sil-saic-ip-abuse-rule-comment-final-package.pdf (English translation provided by the ABA) (last visited Nov. 12, 2015).

[109]*See Verizon v. Trinko*, 540 U.S. 398, 406 (2004).

[110]The essential facility in *Trinko* was the local telephone exchange network, created by AT&T during its period as a regulated monopoly. *Id.*

[111]Christina Bohannon & Herbert J. Hovenkamp, *IP and Antitrust: Reformation and Harm*, 51 B.C. L. REV. 905, 981 (2010) (advocating limiting recovery for IP injuries only to cases in which external harm would have effect on ex ante incentives to innovate).

to exclude, may be increasingly necessary as we approach a post-scarcity society.

Additionally, the single-monopoly-profit argument against essential facilities[112] collapses in post-scarcity world. That argument posits that since a monopolist need not sell to consumers, but could license an essential facility for an equivalent royalty, there is no need for the monopolist to exclude unless it is somehow procompetitive.[113] However, this argument is based on a static view of the market and built on several critical assumptions, including the idea that the monopolist's product is an input into other products in competitive markets, that demand is observable, and that downstream products do not require product-specific investments that cannot easily be repurposed. By contrast, with respect to each of these three assumptions, in the networked post-scarcity world, it is not hard to imagine that a monopolist with an essential facility may exclude a downstream firm when it sees that the latter's products may grow to supplant the former's notwithstanding the possibility of a license, that demand may not be easily observable, especially where competition is "for the market,"[114] and that investments in platforms, networks and the like are in fact not easily repurposed by the second-place finisher.[115]

The third major argument against essential facilities also weakens in a post-scarcity world. That concern is that the essential facilities doctrine places courts into the role of regulators, and that courts are ill-suited to oversee the sharing that the doctrine demands. To the extent that, in a post-scarcity world, the facilities at issue are increasingly nonrivalrous designs or that the costs of sharing start to approach zero, what nonzero costs may arise may stem from commodities like network bandwidth or server space that even judges may find it easier to put a price tag on than they currently might in cases involving, for example, proprietary pharmaceutical data[116] or mobile phone hardware R&D.[117]

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[112]ROBERT BORK, THE ANTITRUST PARADOX 229 (1978); Richard A. Posner, *Exclusionary Practices and the Antitrust Laws*, 41 U. CHI. L. REV. 506, 523-24 (1974).

[113]*See, e.g.*, PHILLIP E. AREEDA & HERBERT HOVENKAMP, ANTITRUST LAW ¶ 773c (Aspen 2001) ("[A] monopolist cannot earn double profits by monopolizing a second, vertically related market."); BORK, *supra* note 112, at 229 ("[V]ertically related monopolies can take only one monopoly profit"); Posner, *supra* note 112, at 524.

[114]*See, e.g.*, United States v. Microsoft Corp., 253 F.3d 34, 64 (D.C. Cir. 2001) (en banc).

[115]*Id.*

[116]*See* Robert Pitofsky, Donna Patterson & Jonthan Hooks, *The Essential Facilities Doctrine Under U.S. Antitrust Law*, 70 ANTITRUST L. J. 443, 444 (2002) (discussing European Court of Justice decision applying essential facilities doctrine to proprietary system of pharmaceutical data aggregator).

[117]*See* M. Brinkley Tappan & Koren W. Wong-Ervin, *Essential Questions About Standard-Essential Patents in the U.S. and EU, ABA Section of Antitrust Law*,

The discussion of essential facilities in a post-scarcity environment must unfortunately be quite preliminary. But as technological abundance progresses, this Article predicts that anti-disruption cases will force courts and scholars to reappraise the essential facilities doctrine in the face of a falling-cost world.

IV. Post-Scarcity, Artificial Scarcity and State Power

> If I am right in supposing it to be comparatively easy to make capital-goods so abundant that the marginal efficiency of capital is zero, this may the most sensible way of gradually getting rid of many of the objectionable features of capitalism . . . Yet there will be many social and political forces to oppose the necessary change.
>
> –John Maynard Keynes[118]

> [T]here is at least one important respect in which the 21st-century economy is different in a way that ought to have a significant effect on macroeconomics: the much larger role of rents on intangible assets . . . There are a couple of obvious implications from this change in the nature of corporate success. One is that profits are no longer anything remotely resembling a 'natural' aspect of the economy; they're very much an artifact of antitrust policy or the lack thereof, intellectual property policy, etc. Another is that a lot of what we consider output is 'produced' at low or zero marginal cost.
>
> –Paul Krugman[119]

While the preceding section addressed the incentive to engage in private anticompetitive conduct to price higher than increasingly low costs, firms also face an incentive to influence the exercise of state power so as to maintain such economic rents. Incumbent firms that currently receive economic rents may face a strong incentive to spend some of that surplus – that is the price they receive above cost – to lobby or otherwise influence state actors to thwart insurgent disruptive firms. The successes and travails of Uber exemplify the negative role that the state may play in powering antidisruption, and help explain why American antitrust law may be forced

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INTERNATIONAL ANTITRUST BULLETIN, July 2013, at 11-12 (discussing EC application of essential facilities doctrine to Samsung's standard-essential patents, and FTC's application of similar theory to Motorola in the context of a consent decree).

[118] Robert Chernomas, *Keynes on Post-Scarcity Society*, 4 J. ECON. ISSUES 1007, 1019 (1984).

[119] Paul Krugman, *How Are These Times Different?*, N.Y. TIMES, Jun. 19, 2013.

to more intrusively deal with anticompetitive restrictions enforced with state power.

A. Uber, the Sharing Economy and Artificial Scarcity

Uber is no stranger to controversy. Labor law,[120] tort and insurance law,[121] and antitrust[122] have all been invoked in complaints about the popular and highly valued ($50 Billion recently[123]) ridesharing service. But regardless of whether one falls into a pro-, anti- or neutral camp regarding Uber, three insights about its development are quite clear: Uber's development hinges on massive cost reductions, its challenge to the traditional taxi industry raises important questions about the need for and social utility of taxi regulation regimes, and it has received fierce pushback from regulators – particularly with the goal and effect of maintaining an artificial scarcity of taxis and their competitors. These facts provide an important example that helps illuminate the potential role of the state in aiding incumbents in keeping rents – and hurting consumers – via antidisruption.

Love it or hate it, Uber and its competitor ridesharing services have revealed previously hidden realities about taxi service.[124] In particular, the rapid growth of Uber hinges on important, dramatic cost reductions in both

[120]*See* Benjamin Means & Joseph A. Seiner, *Navigating the Uber Economy,* 49 U.C. DAVIS L. REV. __ (2016) (setting forth approach to classifying sharing economy workers within existing labor law); Brishen Rogers, *The Social Costs of Uber*, 82 U. CHI. L. REV. DIALOGUE 85, 100-102 (2015) (discussing Uber's relationship to labor standards).

[121]*See* Jennie Davis, *Drive at Your Own Risk: Uber's Misrepresentations to UberX Drivers About Insurance Coverage Violate California's Unfair Competition Law,* 56 B.C. L. REV. 1097, 1106-1107 (2015) (describing insurance coverage gaps that create risk that drivers become uninsured tortfeasors and allegedly exacerbated by Uber's own policies).

[122]*See* Salil K. Mehra, *Antitrust and the Robo-Seller: Competition in the Time of Algorithms,* 100 MINN. L. REV. __ (discussing antitrust complaints about Uber's pricing algorithm).

[123]Douglas Macmillan & Telis Demos, *Uber Valued at More than $50 Billion*, WALL ST. J., Jul. 31, 2015, *available at* http://www.wsj.com/articles/uber-valued-at-more-than-50-billion-1438367457.

[124]*See* Rogers, *supra* note 120, at 87-91 (2015) (observing that Uber seems to have created a "functioning market for car-hire services" that avoids the high search costs and monopoly rents of traditional taxi services, but listing other social costs involving labor law issues, discrimination and privacy violations that Uber may facilitate or commit).

fixed and marginal costs. [125] Think about what a taxi ride requires: a way to match rider and driver, a driver, a car, gasoline, insurance. Some of these are relatively fixed, first-unit costs – you need a system for matching drivers and riders, and a car – others vary more with each ride, such as gasoline and driver-hours-worked.[126] What Uber reveals is a tremendous amount of idle capacity. America's cars are used on average one hour per day, and millions of underemployed Americans possess available time and driver's licenses.[127] Like other "sharing economy" enterprises that seize on idle capacity,[128] Uber's app-based platform drives down fixed and first-unit costs as well as marginal costs of providing rides through the use of the smartphones that two-thirds of Americans already carry on them[129]and the absorption of idle capacity in cars and drivers.

Additionally, Uber's challenge to the traditional taxi industry raises questions about traditional taxi regulation. Much of this is state- and local-government run, and in some American cities, regulators have complicated the operations of Uber,[130] or even prohibited it.[131] Similarly, in Europe,

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[125]*See* Benjamin G. Edelman & Damien Geradin, *Efficiencies and Regulatory Shortcuts: How Should We Regulate Companies Like Airbnb and Uber?*, __ Stanford Tech. L. Rev. __, 2 (forthcoming 2016), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2658603 (last visited Feb. 5, 2016), (observing that "key efficiencies" of firms like Uber, Lyft and Airbnb stem in part from avoidance of fixed costs of traditional service).

[126]*See id.* at 6 (noting cost efficiencies of Uber).

[127]*See* April Rinne, *How Shareable is Your City?,* COLLABORATIVE CONSUMPTION, Oct. 25, 2013, http://www.collaborativeconsumption.com/2013/10/25/how-shareable-is-your-city (last visited Dec. 2015); *see also* Jordan M. Barry & Paul L. Caron, *Tax Regulation, Transportation Innovation, and the Sharing Economy,* 82 U. CHI. L. REV. DIALOGUE 69, 80-81 (2015)(citing data showing that "[t]he vast majority of American commuters get to work by driving in a car, alone" and that the availability of car sharing reduces overall vehicle ownership).

[128]*See* Daniel E. Rauch & David Schleicher, *Like Uber, But for Local Governmental Policy: The Future of Local Regulation of the "Sharing Economy,"* 15-16 (George Mason Law & Economics Research Paper No. 15-01) *available at* http://ssrn.com/abstract=2549919 (last visited Feb. 1, 2016).

[129]Aaron Smith, U.S. Smartphone Use in 2015, Pew Research Center, Apr. 1, 2015, http://www.pewinternet.org/2015/04/01/us-smartphone-use-in-2015/ (last visited Feb. 1, 2016) (reporting that "two-thirds of Americans own a smartphone").

[130]Christopher Bonanos, *Hail Storm,* N.Y. MAG., July 31, 2014, http://nymag.com/news/features/taxis-2014-7 (reporting New York City government requiring that Uber drivers get taxi licenses).

[131]MaryClaire Dale, *Uber Gets OK for Much of Pennsylvania, Not Philly,* ABC NEWS, Nov. 13, 2014, http://www.cnsnews.com/news/article/uber-gets-ok-much-pennsylvania-not-philly (reporting that Pennsylvania's Public Utility Commission, though considering a ban, allows Uber to operate on a conditional basis, though notably not in Philadelphia).

regulators have applied existing taxicab rules to ban Uber in some cities.[132] As would be predicted by George Stigler's classic theory of regulation,[133] well-organized incumbent taxi companies have worked with captured regulators to aggressively fight Uber and other ridesharing insurgents.[134] Concentrated economic interests – in this case incumbent taxi companies – lobby regulators to use state power to maintain entry barriers and artificial scarcity that ultimately hurts consumers. In Philadelphia, evidence has emerged that the Philadelphia Parking Authority (PPA), a local government agency that regulates taxicabs in addition to parking, has hired its own lobbyists to influence the state legislature not to legalize Uber in the city, while simultaneously organizing taxi companies to run undercover stings on Uber drivers and reporting them to police, in large part to preserve the value of the taxi licenses (medallions) from which the PPA generates revenue. [135] Remarkably, the PPA has justified this action based on a sense of "fairness" to licensees (medallion holders). Unfortunately for believers in the underlying rationale for antitrust law, the PPA does not seem to have weighed the possibility that consumer welfare might outweigh taxi companies' cost recovery and the impact to the PPA's own revenue.[136]

But regulatory responses such as that shown in the Uber example could have repercussions beyond reductions in supply and the generation of cartel rents in a static sense. Specifically, the potential for incumbents to influence the use of state power to "antidisrupt" firms that drive down cost through technological change could have real harms to dynamic growth and innovation. While Uber and Airbnb have managed to create successfully businesses despite their challenges to incumbent taxi companies and

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[132]*See, e.g.,* Jeevan Vasagar, *Uber Taxi Service Suffers Setback in Berlin,* FINANCIAL TIMES, Apr. 17, 2014, http://www.ft.com/intl/cms/s/0/1591faf2-c638-11e3-ba0e-00144feabdc0.html#axzz387TxWRMa .

[133]George Stigler, *The Theory of Economic Regulation*, 2 BELL J. OF ECON. & MGT. SCI. 3 (1971).

[134]*See* Rauch & Schleicher, *supra* note 128, at 2.

[135]*See* William Bender, *Emails: Parking Authority Worked with Taxis to Stop Uber,* Philadelphia Daily News, PHILLY.COM, Jan. 29, 2016, http://articles.philly.com/2016-01-29/news/70154082_1_uberx-ppa-taxi-industry (last visited Feb. 5, 2016) (reporting "emails obtained by the Daily News" showing that the parking authority, which has" "[a]n inherent conflict of interest" as it "collects millions of dollars a year in taxicab-related fees" and license (medallion) sales, "teamed with the taxi industry it regulates in an effort to ensure that ride-sharing services remain illegal in Philadelphia").

[136]Vince Fenerty, *Safety, Fairness Drive PPA Ride-share Concerns,* PHILLY.COM, Feb. 1, 2016, *available at* http://mobile.philly.com/beta?wss=/philly/blogs/thinktank&id=367244001 (last visited Feb. 5, 2016) (head of PPA writing that its actions vis-à-vis Uber and its competitors are driven in part by the need for "fair competition" and the "interests of all impacted parties").

hoteliers, respectively, they have faced state powered-antidisruption. And analogous to post-Napster IP rights holders, the next set of incumbents will be further forewarned and might be better forearmed against disruptive insurgents. While the relationship overall between government and innovation is the example of incumbent-protecting application of existing regulation to thwart technology-driven cost reductions seems inarguably bad for consumers.[137]

In sum, the example of Uber shows how disruptive technology can reduce costs, creating efficiencies that can improve social welfare, but also, how state power can be used to aid incumbents. Critically, these anticompetitive actions not only create an artificial scarcity that injures consumer welfare in a static sense, they also reduce the incentives for insurgents to generate dynamic changes in the future to enter markets by driving down fixed and marginal costs. This kind of state-sponsored antidisruption inhibits the process by which a post-scarcity society might arrive. As a result, the US will have to engage in competition law and policy that addresses both effects on innovation as well as the use of state power; neither will be easy.

B. Artificial Scarcity and the State

As discussed previously, IP scholars have been the "first movers" in addressing the implications of a post-scarcity society. Their analyses have been driven in part by IP's recent experience with disruptive innovation-driven cost reductions – most notably with Napster and music file sharing. But additionally, IP scholars have had to reconsider intellectual property law's use of state power to enforce artificial scarcity. As they have recognized, if innovation, production and distribution of IP do not require the same degree of artificial scarcity as an incentive in the future, then such use of state power begins to look more like an abuse of the citizenry.

With this concern for the potential unjustified, state-enforced artificial scarcity, antitrust should also reconsider its role. And indeed, antitrust should address attempts to use IP to maintain scarcity in a post-scarcity world. Such a role will be one that American antitrust law has often sought to avoid – though competition law elsewhere has developed to more actively address anticompetitive restraints stemming from the power of the state. Additionally, and less controversially, antitrust's role in a post-scarcity world may involve a much stronger commitment to competition advocacy – that is, speaking up for the values of competitive markets and voicing critiques of

[137] *See* Sofia Ranchordás, *Innovation Experimentalism in the Age of the Sharing Economy*, 19 LEWIS & CLARK L. REV. __ (forthcoming 2016) (describing argument that the state ends to inhibit sharing economy innovations that threaten traditional incumbents).

state actions that injure consumer welfare.[138] In particular, American antitrust enforcers may need to be more aggressive in holding IP- or innovation-based regulation and rationales to more rigorous mean-ends tests. But there is also lower-hanging fruit: regulation aside from IP law can be used to maintain artificial scarcity long after the incentive goals of existing IP law have been satisfied, as can be seen from the Uber example and has recently been seen in connection with the generic drug Daraprim, in which FDA trial regulations create exploitable market power, with harmful effects on consumer welfare.[139]

However, concern about state-powered artificial scarcity goes beyond not only IP law, it also goes beyond the traditional objects of IP. In fact, state power and regulation can be used to create scarcity for other goods and services.[140] Indeed, the use of sovereign authority to do so animated the some of the earliest competition laws.[141]

The use of state power to artificially generate scarcity is particularly harmful. Harking back to the Williamson model discussed *supra* in Section III.A., when a monopolist or an oligopoly lobbies the state to help increase producers' market power, the losses are greater than simply the deadweight loss triangle familiar to economics students: additionally, profit maximizing firms should be willing to spend substantial resources to induce the state to help the firms acquire or retain market power; that diversion of resources from their highest use in the absence of rent-seeking represents a further efficiency loss.[142]

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[138] *See* Lemley, *supra* note 11 (questioning the role of IP as a competition stiffer in post-scarcity world).

[139] *See* Andrew Pollack, *Big Price Increase for Tuberculosis Drug is Rescinded*, N.Y. TIMES, Sept. 22, 2015, *available at* http://www.nytimes.com/2015/09/22/business/big-price-increase-for-tb-drug-is-rescinded.html (discussing how large US price rise for Daraprim, a generic drug manufactured by a single US company, could easily be undercut by imports from countries where it is made and sold much more cheaply, but for the FDA regulatory burden that makes such importation infeasible).

[140] Izabella Kaminska, *The end of artificial scarcity*, FTALPHAVILLE, June 8, 2012, http://ftalphaville.ft.com/2012/06/08/1030801/the-end-of-artificial-scarcity/ (observing that "scarcity manipulators are finding it harder and harder to convince the world there is a shortage of goods" and observing both IP ("too many pharmaceuticals = *create patents to reward inventors*" "too much free music = *create copyright laws to restrict free access*") and non-IP regulations "too much food = *convince society to constrain itself*").

[141] *See* English Statute of Monopolies of 1623, *available at* http://www.legislation.gov.uk/aep/Ja1/21/3/contents (prohibiting the use of letters patent for most royal monopolies, though preserving that right for inventions of new manufactures).

[142] HOVENKAMP, *supra* note 87, at § 12.2b.

As a result, state-fostered artificial scarcity may require American antitrust law to become more like competition law in other parts of the world. In some of the largest world economies, such as those of China and the EU, the competition law regime explicitly and actively regulates the use of state power in anticompetitive ways.[143] By contrast, American antitrust law contains broad judge-made exceptions that greatly narrow its ability to deal with state power.[144] The move towards post-scarcity conditions plus the increasing incentive for incumbents to lobby for state-powered artificial scarcity may require antitrust law to reconsider and to reach government anticompetitive action more broadly. This will be a difficult challenge, but not one without precedent, fortunately.

C. Prescriptions

Despite – or arguably because of– a general political atmosphere that leans towards free-market economics, American antitrust law currently takes a "hands off" approach towards state interference with markets.[145] Given this tendency plus a lack of judicial experience with a post-scarcity economy, any policy proposals must be somewhat tentative. Nonetheless, there are two ways in which American antitrust can evolve that may reduce attempts at state-driven artificial scarcity that do not involve drastic changes with potentially major unforeseen consequences.

First, courts should move towards more substantive review of economic regulation. Notably, the federal courts of appeal are currently split with respect to whether "naked economic protectionism" is justification enough to satisfy rational basis review,[146] and this has led to a robust

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[143] *See* Salil K. Mehra and Meng Yanbei, *Against Antitrust Functionalism: Reconsidering China's Antimonopoly Law,* 49 VA. J. OF INT'L L. 379, 416-22 (2009) (discussing the competition law approach to anticompetitive state action in China and the EU).

[144] *See* Jim Rossi, *Political Bargaining and Judicial Intervention in Constitutional and Antitrust Federalism*, 83 WASH. U.L.Q. 521,536–38 (2005) (describing judicial deference to states under antitrust immunity based on federalism concerns).

[145] *See* FTC Office of Policy Planning, Report of the State Action Task Force (Sept. 2003), *available at* https://www.ftc.gov/sites/default/files/documents/advocacy_documents/report-state-action-task-force/stateactionreport.pdf (last visited Jan. 15, 2016) (thorough review of state action cases concluding that courts' unsettled and expansive reading of antitrust immunity for state action had undeservingly shielded substantial anticompetitive conduct).

[146] *Compare* St. Joseph Abbey v. Castille, 712 F.3d 215, 218 (5th Circ. 2013) (striking down exercise of state power based on naked economic protectionism) and Craigmiles v. Giles, 312 F.3d 220, 229 (6th Cir. 2002) (same) *with* Sensational

scholarly debate on the question.[147] While a full treatment of this discussion is beyond the scope of an antitrust-focused article, the considerations discussed previously about the transition to a post-scarcity economy counsel that, all things being equal, this question should be answered in the negative. Moving the review of "naked economic protectionism" in this direction may be particularly important since, as production costs fall towards zero, the relative benefits of investing in attempts to drive fixed or marginal costs down will start to pale in comparison to investments in lobbying to garner favorable artificial-scarcity creating regulation.

Additionally, and more broadly, the realization of a post-scarcity society may require a high degree of competition advocacy. In particular, antitrust agencies should adopt stronger policies of speech and discussion regarding legislation and regulation that may tend to thwart cost-reducing disruptive technology. This is particularly important for those technologies – such as Internet-based mass collaboration – that do not have built-in advocates in the form of IP rights holders. The federal antitrust agencies are well-placed to do this advocacy; they possess institutional strengths such as economic and industry knowledge, and they also have developed a reputation for technocracy that buffers them to a degree from political interference.[148] Much as federal authority guides and creates norms for local policy in law enforcement, education, and other areas, it may also do so regarding local economic regulation that creates artificial scarcity.[149]

Smiles, LLC v. Mullen, 793 F.3d 281, 284 (2d Cir. 2015) (upholding exercise of state power based on naked economic protectionism) and Powers v. Harris, 379 F.3d 1208, 1215 (10th Cir. 2004) (same).

[147] Stephen Menashi and Douglas H. Ginsburg, *Rational Basis with Economic Bite,* 8 NYU J. OF L. & LIBERTY 1055, 1086-87 (2014) (approving of appearance of "rational basis with bite" in lower courts, in which they invalidate acts of naked economic protectionism); Randy E. Barnett, *Scrutiny Land,* 106 MICH. L. REV. 1479, 1495 (2008) (suggesting that approach in *Lawrence* v. *Texas* was departure from normal rational basis review that could be applied in the future to create a "presumption of liberty" usable in economic liberty cases); Cass R. Sunstein, *Naked Preferences and the Constitution,* 84 COLUM. L. REV. 1689, 1895-96 (1984) (advocating more tolerant approach towards naked economic protectionism). *See also* Aaron Edlin and Rebecca Haw, *Cartels by Another Name: Should Licensed Occupations Face Antitrust Scrutiny?* 162 U. PA. L. REV. 1093 (2014) (considering similar motives as naked protectionism for licensed occupation and antitrust implications).

[148] Daniel A. Crane, *Technocracy and Antitrust,* 86 TEX. L. REV. 1158, 1178-79 (2008) (discussing development and policy shifts leading to development of technocracy in antitrust enforcement).

[149] *See, e.g., Federal, State and Local Government Officials Band Together to Combat Bullying,* Sept 14, 2012, *available at* http://www.justice.gov/archive/usao/can/news/2012/2012_09_14_stopbullyingsummit.press.html (discussing DOJ Civil Rights initiative guiding local government in an area involving both law enforcement and education).

Furthermore, some attempts at warning that include an appraisal of regulatory costs – in the manner of OIRA, for example – may be particularly useful in making competition advocacy in this regard more digestible for legislators, regulators, stakeholders and the public at large.[150]

V. Conclusion

> Cast ye up, cast ye up, prepare the way, take up the stumbling block out of the way of my people.
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> –Isaiah 57:14[151]

The idea of a post-scarcity economy may sound a bit Panglossian, and competition law might not be the first thing most would associate with a potential material paradise on Earth. Admittedly, such a society would involve more changes, and probably more legal changes, than competition law reforms. Nevertheless, as this Article has argued, the real challenge of technological abundance may be the transition away from a traditional economy – many incumbent interests would see their oxen gored. Competition law for a post-scarcity society requires activity in the near term to counteract both private and state anti-disruption; it will fall on competition law to oppose forces that would prevent such a world from being realized.

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[150] *See* John M. Broder, *Powerful Shaper of U.S. Rules Quits, With Critics in Wake*, N.Y. TIMES, Aug. 4, 2012 (describing OIRA's role in providing regulatory burden cost-benefit analysis regarding acts of federal government), *available at* http://www.nytimes.com/2012/08/04/science/earth/cass-sunstein-to-leave-top-regulatory-post.html.

[151] Isaiah 57:14.