The Creative Destruction of Antitrust

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Abstract

The dynamic innovative leap-frogging character of competition contrasts with the static low-concentration price competition of economic textbooks that has been a foundation of much antitrust policy in the United States and Europe. Highly concentrated markets that are dynamically competitive have resulted in major innovations and lower prices. As Schumpeter and Christensen note, large incumbent firms are vulnerable to disruption by small startups. The institutions of capitalism evolve in unexpected and unpredictable ways. In the absence of foresight on how they will evolve, and given the resilience of dynamic competition, an antitrust policy of "first do no harm" may be prudent.

> . . . it's hard to imagine tens of thousands of people gathered on the Mall, carrying placards with pictures of Joseph Schumpeter, and demanding that the government give them more "creative destruction." (Melamed, 1997, p. 12)

1. Antitrust

In *Capitalism, Socialism, and Democracy*, Schumpeter had a lot to say about his process of "creative destruction," not all of which is given equal emphasis by those using the phrase today. Here, I will distinguish two accounts of the process of creative destruction: Schumpeter's original 'big-is-better' account, and a more recent 'small-is-better' account. The process of creative destruction, in both Schumpeter's original, and in the more recent account, is a process in which technological advance is the main source of economic growth and improvements in the quality of life. In both accounts, a significant part of the incentive to produce leapfrogging innovations is the prospect of achieving monopoly profits. Traditionally the main source of monopoly profits would have been through patent rights. But currently a full account of monopoly profits would also include network externalities as a source (as with eBay and Microsoft).

Beyond what the two accounts share, Schumpeter's original 'big-is-better' account also claimed that large, monopoly firms are the most able and the most likely to produce new, leapfrogging innovations. This version is the one usually, but not always[1], associated with Schumpeter's own views. The 'small-is-better' account

identifies smaller, often start-up, firms as the most likely source of new leapfrog innovation. I argue elsewhere (2004) that the 'small-is-better' account is what the vast majority of authors have in mind when they apply the phrase "creative destruction" to competition among computer and internet related firms.

Schumpeter's claim was that the new process or product that results from a dynamic leapfrogging innovative competition, is more important in understanding capitalism, than the static standard model of price competition that emphasizes unconcentrated markets as the means to lowering prices, where the goods and the technologies are assumed constant. If one set of rules (standard price competition) maximized one good result (lower prices for consumers); and another set of rules (creative destruction) maximized another good result (new products), then we would have to measure the utility produced by each of the good results, which is very hard to do.[2] What if the creative destruction is not only best at producing new products, but also, in creating new processes, is also best at lowering prices for consumers? Then we would know the essential fact about capitalism, without having to decide whether consumers benefit more from lower prices for a constant set of goods, or from a set of goods of higher price, but of increasing variety and quality.

In what follows, I begin by briefly discussing some evidence that highly concentrated markets may have lower prices than markets that fit more closely the standard model of price competition. I then discuss the evidence against the 'big-is-better' account and favor of the 'small is better' account.

Schumpeter himself warned against overly-aggressive antitrust (in McCraw's words, 2007, p. 179).

2. Evidence Prices Can be Lower in a Highly Concentrated Industry

Schumpeter famously claimed that to discuss capitalism without mentioning the process of creative destruction would be like discussing the play Hamlet, without mentioning the Danish prince (1950, pp. 83-85). But, in fact, the most common way to discuss capitalism, in Schumpeter's day and our own, is to omit creative destruction, and focus instead on price competition as the essential element.

The standard model of price competition that is presented in almost all principles of microeconomics texts, tells us that in an unconcentrated market with many small suppliers, the consumer will pay lower prices than she would if the same market were more concentrated. The case is strongest when comparing "pure" competition with monopoly. But even there, it rests on assumptions that are not necessarily true, such as that costs would be the same under either market structure. It thus rules out the possibility that monopolies may have lower costs, either through technological improvements, or through economies of scale.

If a large, or monopoly, firm has either sufficiently better technological processes, or economies of scale, then the firm may be earning substantial monopoly profits at the same time that it both lowers prices to the consumer, and introduces important process and product innovations.[3] This is what happened in the famous case of Standard Oil. At the beginning of its ascent in 1870, the price of refined kerosene was 26 cents a gallon, and Standard Oil's cost to produce it was 3 cents a gallon. At

the height of its market power in 1885, the price of refined kerosene was 8 cents a gallon, and Standard Oil's cost to produce it was .452 cents a gallon (Armentano 1972, p. 70). The evidence on Standard Oil suggests that Rockefeller was able to greatly improve the production process[4], allowing both great profits for himself, and substantially lower prices for consumers.

In more recent times, many analysts (e.g., Simchi-Levi, et al, 2003, pp. 63-64) have painted a similar picture of Wal-Mart. The company has leapfrogged other retailers in the use of information technology to manage the logistics of the supply chain, and to understand patterns of consumer demand. As a result, the company has both been highly profitable, and provided the consumer with lower prices.

Another case where the firm may have earned substantial profits at the same time that it lowered prices for the consumer may have been what happened with Microsoft. For example, in the early days one reason that Microsoft's DOS became dominant was that it was priced significantly lower than Gary Kildahl's CP/M operating system (Carroll 1993, p. 41). For the later period of Microsoft market share dominance, Schmalensee has presented plausible calculations that Microsoft was charging much less than what would be expected from the theory of monopoly-pricing (see Gilbert and Katz, 2001, p. 29).[5]

3. Evidence for the 'Small-is-Better' Account of Creative Destruction

The 'big-is-better' account has been shown to not generally be true. Referring to this version, Scherer reports that in his substantial 1965 empirical study:

> The results suggested that Schumpeter's assertions in *Capitalism, Socialism, and Democracy* were more wrong than right. Giant monopolistic corporations were not uniquely efficacious engines of technological advance. (2005, p. 394)

Also relevant is the Acs and Audresch (1990) research showing that optimal firm size for innovation significantly varied by industry. Most notably, Christensen and his co-authors (2002a, 2003b, 2004) have presented substantial theory and evidence of how hard it is for an incumbent firm to successfully introduce a disruptive innovation.

The evidence of rapid and increasing turnover among the largest, most powerful, firms, by various measures, is evidence that supports the 'small-is-better' account of creative destruction. This evidence would include that discussed in Foster and Kaplan's *Creative Destruction*, in Zook and Allen's *Profit from the Core*, and in Olson and Bever's *Stall Points* (2008). Also, and perhaps most powerfully, the evidence and theories in a variety of books, articles and case studies by Christensen and co-authors, support the 'small-is-better' account.

A common form of evidence for the small-is-better account consists of data showing how hard it is for large dominant firms to remain large and dominant for an extended period. One good source for this sort of data is Foster and Kaplan's *Creative Destruction*. For example, they examine the fate of the firm's in *Forbes*' 1917 list of 100 largest firms. By 1987, 61 of these firms no longer even existed. And of the 39 that still existed, only 18 were still among the largest 100. The figure below lists these 18 firms. Of the 18, only two had a growth rate in 1987 that was higher than the

average for U.S. firms.

Figure 1: Of 18 Out of 100 Who Remained in Largest 100, All But Two Underperform U.S. Average Growth. Source: Foster & Kaplan, 2001, p. 8. (Proofread by AMD on 9/27/07.)

Foster and Kaplan also present evidence in their book (p. 11) that in 1998 the turnover rate of the S&P 500 was approximately 10%, implying that the average firm could expect to remain in the S&P 500 for only approximately 10 years. This contrasts with a turnover rate of about 1.5% in the 1920s and 1930s---a rate that implies an expectation of a roughly 65 year average tenure in the S&P 500. The declining length of tenure in the S&P 500 might be evidence to support the claim of some (e.g., Greenspan; see Useem, 2001) that the process of creative destruction has been speeding up in the United States. The increasing pace of creative destruction is also independently supported in Chun, Kim, Morck, and Yeung 2008. [re-confirm that this claim from the 2004 version is still true in the 2008 version]

In a more recent Morck paper (Fogel, Morck and Yeung 2008), the co-authors find that the increasing pace of turnover of the big business sector is correlated with faster economic growth. Moreover, they also find that an increasing pace of turnover does not have the sometimes-alleged, deleterious effects on "public goods provision, egalitarianism, or labor empowerment."

The figure below from the Corporate Strategy Board is part of an extensive report that the Board presented to its large-scale corporate clients, documenting how hard it has been for large companies to maintain credible growth records. Zook and Allen (2001, p. 12) also provide additional evidence of how hard it is for large firms to sustain growth.

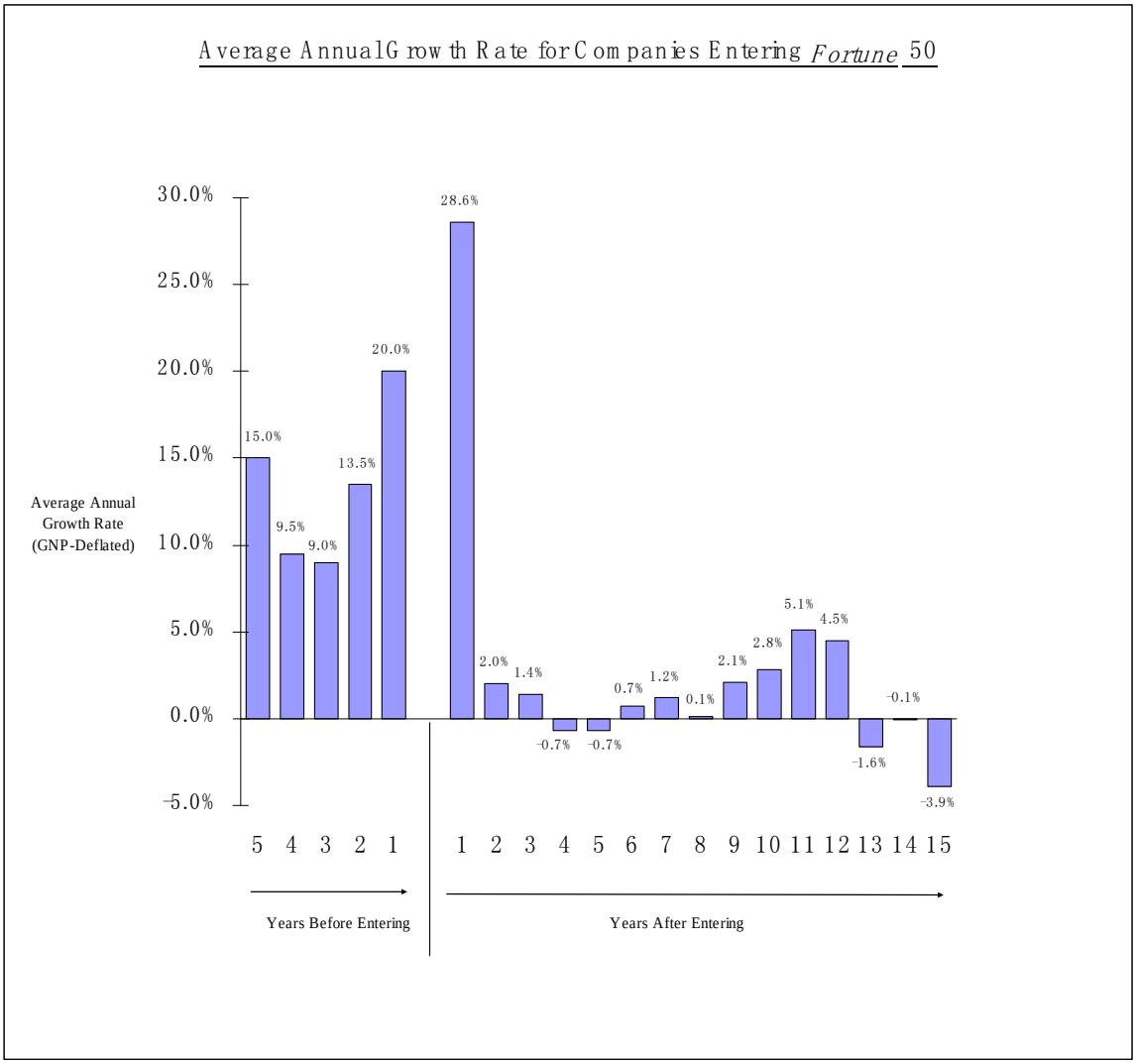


Figure 2: Few Companies Sustain Growth. Source: Stall Points, 1998, p. 15. (Proofread by AMD on 9/27/07.)

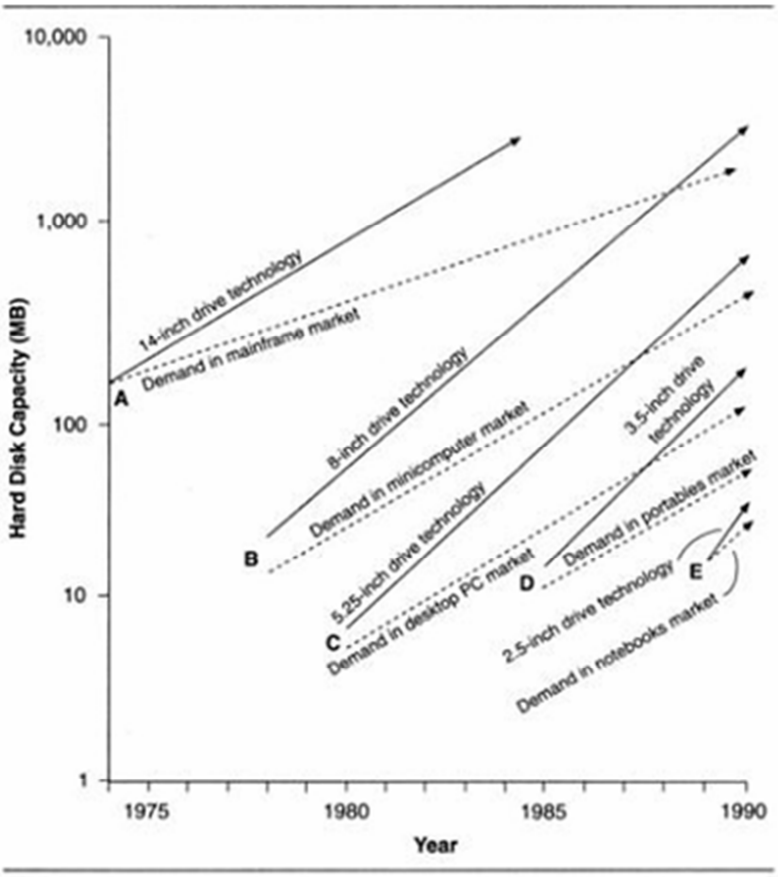
Besides evidence of the frequency and speed with which firms grow, and decline, another sort of evidence for the growing ubiquity of creative destruction in the United States economy is provided by the growing list of well-documented, or at least plausible, recent examples. One of the richest sources of such recent examples would be a set of three recent books authored, or co-authored, by Clayton Christensen (Christensen 2003, Christensen and Raynor 2003, Christensen et al 2004).

On May 11, 2004 among the 2,866 books on Amazon.com's "Search Inside the Book" feature that reference Schumpeter, the number-one bestselling book was Christensen and Raynor's *Innovator's Solution*. Like Schumpeter, Christensen had early experience in business, serving as chairman and president of Ceramics Process Systems Corporation. His earlier book, *The Innovator's Dilemma*, was widely acclaimed, receiving the *Financial Times'* Global Business Award for being the "best business book" for 1998.

The "dilemma" in Christensen's *Innovator's Dilemma* belongs to the incumbent firm.[6] Christensen distinguishes between two sorts of innovations. Sustaining innovations are innovations that will be valued by the incumbent firm's mainstream customers. The incumbent firm will pursue sustaining innovations, generally with success. The dilemma arises with the disruptive innovations. Disruptive innovations initially do not appeal to the mainstream customers of the incumbent firm. They frequently are too small, or to slow, or otherwise underperform what the mainstream customers want.

Christensen's most extensive example in the first book discusses successive generations of hard drives. The initial 5.25-inch hard drives did not have the capacity

that mini-computer users wanted, so they had no interest in them. When the 8-inch drive companies listened to their mini-computer manufacturer customers, they saw no reason to develop the 5.25-inch drives. But there was a small niche market among personal computer users, who valued the 5.25-inch drives because of their small size. Start-up firms pursued this niche market and improved the technology over time, until it was increasingly competitive along all dimensions, with the 8-inch drives. By then it was too late for the incumbent firms to master the technology fast enough and well-enough to compete with the start-ups. The same story was repeated with successive generations of hard drive technology.



Source: Clayton M. Christensen, "The Rigid Disk Drive Industry: A History of Commercial and Technological Turbulence," *Business History Review* 67, no. 4 (Winter 1993): 559. Reprinted by permission.

Figure 3: Christensen's Graph on New Generations of Hard Drives as Disruptive Innovations. Source: Christensen 2003, p. 17.

The first book provides extensive documentation of the hard drive example, and significant documentation on a second example: mechanical excavators. Much briefer discussion of other examples is also included. In the second book, *Innovator's Solution*, written with Raynor, Christensen lengthens the list of examples, and elaborates the theory of how hard it is for incumbent firms to survive in the face of disruptive innovations. Although good examples occur throughout the book, a

particularly efficient compilation of many examples occurs in the table on pages 56-65. Some of the cases in the table that seem good candidates to be major examples of successful leapfrogging competition, would include the following. Minicomputer makers such as Digital Equipment, leapfrogged mainframe makers such as IBM. PC makers such as Apple and Compaq, leapfrogged minicomputer makers such as Digital Equipment. Dell's direct retailing model, leapfrogged the previously leading PC retailers, Compaq, HP, and IBM. Online brokers such as Ameritrade and Schwab leapfrogged traditional brokerages such as Merrill Lynch. Online travel agencies such as Expedia, leapfrogged bricks-and-mortar agencies such as American Express. Department stores such as Macy's and Marshall Fields, leapfrogged small shopkeepers. Discount stores such as Kmart and Wal-Mart, leapfrogged department stores such as Macy's and Marshall Fields.

The process of creative destruction, as elaborated by Christensen, implies a much more laissez-faire policy on antitrust. Christensen has developed evidence and arguments about why it will be hard for large firms to continue to be innovative. As long as coercion is not used to restrict entry, the small firms do not need any assistance from the government in order to succeed.

At least since the Brown Shoe case, the antitrust policy of the United States has been to support small firms, even in the face of evidence suggesting that larger firms (more market concentration) would better serve the interests of the consumer (Bork 1978, pp. 210-216). This dominant policy has been supported by the standard economic analysis that says that lower prices are the outcome of price competition in an

(unconcentrated) market of many sellers.

Although Christensen is so far mainly aiming to influence business practice, he is aware that his arguments and evidence have implications for government policy as well. (Christensen and Raynor, pp. 135-136 & 145, note 14.)

Farrell points out (2003, p. 106) how Schumpeterian competition, rather than maintaining many small competitors, has been the key in explaining why the growth in European mobile-telecom labor productivity has been substantially higher than in the United States. German banks are shielded from some of the demands of the capital market, and so are smaller scale, with less gains in productivity (pp. 106-107). French zoning laws reduced competition in retailing, resulting in smaller productivity gains than in the United States (p. 107).

To more systematically test the hypothesis of Schumpeter's absence from the debate, we made use of the Lexis-Nexis reference tool includes a searchable database of all Supreme Court Decisions.[7] Of those decisions, 804 are classified under the keyword "antitrust." Antitrust economist George Bittlingmayer suggested to us the names of 7 economists who were likely candidates to have been mentioned in antitrust decisions. We searched for mentions of them, and eliminated mentions that appeared to be to others who shared the same names. The figure below presents the results. Most dramatically, Schumpeter is never mentioned in any of the 804 cases.[8]

Search Term(s)	Number of Decisions
Stigler	8
Scherer	8
Bain	5
Adam Smith	3
Stiglitz	2
Carlton	1
Schumpeter	**0**

Figure 4: Number of Supreme Court Antitrust Decisions that Refer to Selected Economists

4. Conclusions on Monopoly and Antitrust

Although the evidence for the truth and importance of creative destruction is being increasingly accumulated and recognized, I have argued elsewhere that the importance of creative destruction is not being very effectively communicated to a wider audience. Here I have suggested that it is not being applied to relevant policy issues, such as antitrust. It is highly plausible that our rate of economic growth would increase if we adopted policies making our economy more open to creative destruction.[9]

Schumpeter's process of creative destruction states that technological advance is the main source of economic growth and improvements in the quality of life. It further states that a significant part of the incentive to produce leapfrogging innovations is the prospect of achieving monopoly profits. The original 'big-is-better' account adds the view that large incumbent firms are most likely to be the source of leapfrogging

innovations. In contrast, the new 'small-is-better' account adds the view that small, new firms are most likely to be the source of leapfrogging innovations.

I also have discussed the evidence against the old 'big-is-better' version of creative destruction and in favor of the new 'small-is-better' version. I find that there is substantial and growing evidence that leapfrogging innovations are at least as likely to arise from small, new firms, as from old, large firms.

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Footnotes

* Prepared for presentation to the 2012 APEE meetings.

[1] Anne Mayhew has argued (1980) that Schumpeter did not believe that larger firms were necessarily more likely to innovate than smaller firms. Mayhew's view is supported by Schumpeter's account in *Business Cycles*, that emphasizes innovation generally arising from entrepreneurs operating in small firms (see McCraw 2007, pp. 255, 266, and footnote 56 on p. 613). (It also is interesting that E.F. Schumacher, the author of the best-selling *Small is Beautiful* book, had been a student of Schumpeter's (see McCraw 2007, p. 191)

[2] Comparing the benefits from lower prices with those from new products, would not be easy. We have highly mathematical models of price competition, and widely understood graphical approximations of these models. Of related and perhaps equal importance, we have well-understood and frequently applied methods for measuring the benefits from static competition (notably the consumer surplus concept). In contrast we do not have any widely-accepted mathematical models, or graphical approximations, explaining the process of creative destruction. And even more importantly, we have found it extremely difficult to measure the benefits of the new product or the new process.

[3] It is not clear that we should care how rich some short-term near-monopolists get, as long as the consumer benefits with lower prices and better products. But for those who do care, it may be reassuring that William Nordhaus has found (2004) that for the

economy as a whole, the size of monopoly profits due to Schumpeterian monopolies is fairly small.

[4] Ron Chernow in his massive biography of Rockefeller (1998), provides extensive discussions of how production processes improved under Rockefeller (e.g., pp. 79, 100, and esp. 179-181).

[5] Besides the empirical evidence sketched here, both Demsetz (1968) and Baumol et al, (1988) have presented theoretical arguments to suggest that highly concentrated markets may often offer the consumer prices that are as low as those offered in unconcentrated markets. These arguments assume the barriers are not too high to potential competition, and that the incumbents in the market lower their prices to deter entry. Observations of the price competitiveness of many highly concentrated, oligopolistic markets (e.g., airlines since deregulation, breakfast cereals, satellite radio), also challenges the usual conclusion that low prices are more likely in an unconcentrated market structure of many small firms.

[6] An extensive literature exists suggesting that large firms may have problems innovating, due to inertia, and problems with their internal incentive structure. See, e.g., Berle and Means (1932); Henderson (1993).

[7] I am grateful to George Bittlingmayer for suggesting the use of this resource. In the future I would like to explore whether there exists a similar database of Mario Monti's European Commission antitrust decisions to search for references to economists.

[8] George Bittlingmayer directed me to a speech by an antitrust official, that refers to Schumpeter in order to dismiss his relevance to antitrust policy:

> As Joseph Schumpeter first taught us, productive and dynamic efficiencies are at least as important as static allocative efficiency in promoting economic growth. These efficiencies are often hard to measure; placing too high a burden on the parties to quantify these efficiencies and to show that they are merger-specific therefore risks prohibiting transactions that would be efficiency-enhancing. At the same time, it often said that more than two-thirds of all mergers fail so we should also be careful not to accept efficiencies claims on faith alone. This is why in the United States, we don't count efficiencies "if they are vague or speculative or otherwise cannot be verified by reasonable means." (Kolasky 2002)

[9] As part of an argument that we can significantly increase the rate of economic growth through institutional change, Romer makes the case for optimism: "Given the limited state of our knowledge of the process of technological change, we have no way to estimate what the upper bound on the feasible rate of growth for an economy might be. If economists had tried to make a judgment at the end of the 19th century, they would have been correct to argue that there was no historical precedent that could justify the possibility of an increase in the trend rate of growth of income per capita to 1.8% per year. Yet this increase is what we achieved in the 20th century." (Romer 2001, p. 226)

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