Schumpeter's Central Message

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Abstract

Dynamic competition through the process of creative destruction encourages the innovation in product and process that lengthens and improves lives. This is Schumpeter's central message. Increasing evidence supports the message. And increasing numbers of academic social scientists, and business and policy analysts, take the message seriously. However economists have lagged in presenting the message as part of the core of useful economic knowledge taught to undergraduates. And the message has not filtered into policy decisions in antitrust cases.

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Introduction

> ". . . we live in the Age of Creative Destruction, the term coined by the pre-war economist, Joseph Schumpeter." **Franklin D. Raines**, Chairman and CEO, Fannie Mae

". . . , if we call the economy of the last two centuries primarily "Smithian," the economy of the future is likely to be primarily "Schumpeterian"." **DeLong and Summers**.

"Now, at the turn of the millennia, when total-factor-productivity has remarkably soared in America and abroad, both fools and sages sing Schumpeter's praise. That would have amused and pleased this worldly scholar who in some dark hours of the night used to despair in his German-shorthand diaries of justly deserved praises passing him by. So Keynes was wrong: in the long run not all of us are dead." **Paul Samuelson**, 2003, p. 467.

Don Patinkin suggested that primary credit be given, not to the scholar who first mentioned an idea, but to the scholar who first made the idea part of his "central message." Stigler, to the contrary, suggests that what is most important about a scholar is not what the scholar necessarily most emphasizes, but rather what turns out to be useful to other scholars: "The recipients of a scientific message are the people who

determine what the message is, . . .” (Stigler, 1982, p. 91) In this view the “central message” is what the readers find most important in the work.

The Patinkin approach would lead to textural exegesis of Schumpeter. I choose, instead, to follow Stigler, and ask how Schumpeter has been, and even more importantly, currently is, being used by the business and scholarly community.

Several different candidates have been suggested for Schumpeter’s “central message.” 1. an evolutionary account of the development of knowledge (e.g. Anderson, Metcalfe), 2. a long-wave account of innovations and business-cycles (e.g., Mansfield), 3. the view that large firms are more likely to innovate (e.g., Link), 4. the view that “leap-frog” dynamic competition is more important than price competition in improving the lives of consumers (e.g. Rogge), and 5. the view that creative destruction correctly characterizes much important innovation, implying that the market must be allowed to destroy industries and jobs if new industries and jobs are to be created (e.g., Baily).

There has been a claim that there is a recent Schumpeter renaissance (e.g., Friedman, 1999; Rosenberg, 2000; Useem). In addition, Schumpeter’s message is being illustrated, rigorously documented, extended and elaborated by a group of important business practitioners and academics, notably including monographs by Grove; Foster & Kaplan; Christensen; Christensen & Raynor; and Zook & Allen.

One place to look for evidence of Schumpeter’s growing importance will be the citation counts of his works collected from the *Social Sciences Citation Index*. Another form of evidence can be obtained by using the new Amazon “Search Inside the Book”

feature to see which sorts of books are currently mentioning Schumpeter, and to what sorts of use Schumpeter is being put.

If we find that Schumpeter's influence is indeed growing among academics and practitioners, we will ask two more questions. "How well is the economics profession communicating this to a wider audience?" and "How well is Schumpeter's thought being applied to antitrust issues?" To answer the first of these questions, we will examine Schumpeter references in leading principles of microeconomics texts. To answer the second, we will examine the references to Schumpeter in U.S. Supreme Court antitrust decisions.

An opening caveat is in order. The evidence presented and discussed in this paper refers almost exclusively to authors and policies in the United States. Some might argue that this is justified by the relative size of the United States economy. Others might justify it on the grounds that if Schumpeter's influence on policy is to be found anywhere, it would be most likely to be found in the United States. (So if you are making a case for lack of influence, the United States would be the toughest case to pick.) But in truth, the main reasons are simply the constraint of limited time, combined with the author's much greater familiarity with sources in the United States.

Schumpeter made many claims, not all of them mutually consistent. He sometimes emphasized the circular flow of an economy; but other times wrote of entrepreneurs who do not fit neatly into the circle. He helped found the Econometric Society,[1] and encouraged Samuelson in the mathematization of economics, but elsewhere claimed that good economics depends more on a knowledge of economic

history than on a knowledge of mathematics (Samuelson, 2003, p. 465). My hypothesis is not that all of what Schumpeter claimed is true and important, or even that most of what Schumpeter claimed is true and important. Rather I claim that Schumpeter's central message is true and important.[2] I suggest further that while many economists give favorable mention to Schumpeter's central message, and some do much more than give favorable mention, the central message still is usually not taught as part of the core of what economists know. And even when it is taught, it is taught briefly as an alternative point of view. I hypothesize, finally, that when policy-makers make decisions in arenas such as antitrust, and economic development, they seldom take account of Schumpeter's central message.

Schumpeter's Central Message

The question I ask is not "what did Schumpeter most value in his work?" but rather "what is most worth valuing in Schumpeter's work? No question in economics is more important than the question of why some people live "much longer and richer lives than other people. Schumpeter's answer is that capitalism has been the engine of human improvement, and that the key to capitalism's success is the process of creative destruction. Thus the locus of Schumpeter's central message is in chapters 5 through 8 of *Capitalism, Socialism and Democracy*, and especially in chapter 7 entitled "The Process of Creative Destruction."

In reading Andy Grove's best-selling business book, *Only the Paranoid Survive*,

before the introduction, before the table of contents, even before the title page, the reader encounters the following edited excerpt from Schumpeter's *Capitalism, Socialism and Democracy*:

> But in capitalist reality, as distinguished from its textbook picture, it is not (price) competition which counts but the competition from the new commodity, the new technology, the source of supply, the new type of organization . . . competition which . . . strikes not at the margins . . . of the existing firms but at their foundations and their very lives.

This passage contains a brief description of the capitalist process that Schumpeter elsewhere calls "creative destruction." I take Creative Destruction and its implications for consumer well-being, firm behavior and government policy, to be Schumpeter's central message.[3]

My purpose in this section is to sketch the elements of the central message.[4] In the next section, I will sketch the evidence that supports the central message. I then proceed to provide elaborations of the central message in more recent research.

The standard "textbook" model of capitalist competition, takes products and production processes as given, and asks what market structure will lead to the lowest prices for consumers. The model implies that when there are many sellers, the market structure will be competitive, and that a competitive market structure will result in lower prices for the consumer. The standard account shows that at a moment in time, a monopoly charges a higher price, and produces less, than would the same industry under pure competition. Thus the consumer is viewed as benefiting from breaking up

monopolies.

Schumpeter accepts this conclusion of the standard model, but argues that the model misses the central issue in evaluating a market structure. For Schumpeter, the most important question is not which market structure produces the lowest prices. For Schumpeter the most important question is which market structure produces the greatest leaps forward in new products and processes. The standard view is of competition at a moment at time, while Schumpeter says the most important kind of competition is the leap-frogging, dynamic kind of competition. Schumpeter views the price effect as minor compared with the incentive effect in allowing successfully innovative firms to make large profits from patent-based monopolies until they are leap-frogged by a better innovation.

I take the following propositions to be the essential components of Creative Destruction:

1. The process of Creative Destruction substantially improves the lives of almost everyone.

2. The dynamic competition that creates new products and processes is more important at improving lives than the static price competition that has been the focus of mainstream economics.

3. When old technologies are destroyed, workers may need to retrain and firms may need to re-tool, a process that can be difficult and costly.

4. Large firms, with high market shares, may be an important part of the process

of dynamic competition, that leads to innovation.

On proposition 1, we have Schumpeter's famous comment[5]:

"Queen Elizabeth owned silk stockings. The capitalist achievement does not typically consist in providing more silk stockings for queens but in bringing them within the reach of factory girls in return for steadily decreasing amounts of effort." (p. 67)

On first glance, this might seem to be an example of capitalism benefiting the "factory girls" through price competition bringing silk within their reach. But that is not what Schumpeter had in mind. He was referring to the invention of synthetic fibers, such as nylon, making available to ordinary people something they had not previously had. (The rich had been able to afford silk, the expensive substitute for nylon.) This interpretation is supported by an earlier sentence in the same paragraph: "Electric lighting is no great boon to anyone who has money enough to buy a sufficient number of candles and to pay servants to attend to them." (p. 67)

Although it is not essential to our case, we may imagine that Schumpeter himself would not have blanched to have Creative Destruction identified as his central message. For Schumpeter, to ignore the dynamic competition that comes from the new product or process would be ". . . like Hamlet without the Danish prince." (p. 86) Creative Destruction is the *sine qua non* of capitalism, just as the Danish prince is the *sine qua non* of Hamlet.

Please note that several important Schumpeterian claims are not part of the

central message, e.g.:

1. Major innovations come in long wave cycles.
2. Large firms have an advantage in innovation.
3. Capitalism will not survive.
4. Concepts from evolution can be usefully applied to economics.

Each of these claims is important and interesting. But the truth and importance of Creative Destruction will remain, no matter what we conclude about the truth of these four claims. Claim number 2. might seem inconsistent with my component 4., that says large firms may be important to Creative Destruction,. I believe that the way large firms are essential to the process of Creative Destruction is that when a firm successfully innovates, it receives a patent that gives it a limited-time monopoly over the production of the innovation. During that time it may well become large, as a consequence of its reaping its reward for successful innovation. But that is quite different from arguing that once large, the firm has a special advantage at innovation. On this latter issue, there are arguments and evidence on both sides. For example, Acs and Audretsch in their large systematic empirical study of his issue found that in some industries size seemed positively related to innovativeness, and in some negatively related. The recent work of Christensen (see below) suggests that for sustaining innovation, large size may help, but for the arguably more important disruptive innovations, large size is a major disadvantage.

Evidence for the Truth of Creative Destruction

The evidence for the truth of Creative Destruction deserves a whole paper in its own right. But here we simply catalog some of the evidence that should be examined. Tables and figures referred to in this section appear in the "Appendix of Evidence Supporting Aspects of Creative Destruction" that is located just before the "Appendix on Citation Issues," near the end of the paper.

Back in 1978 Ben Rogge presented Table A-1, from his consulting work with Eli Lilly that is useful for illustrating the process of Creative Destruction. The table displays market shares for 10 different diuretic drugs over a ten year period. During any single year, the market is dominated by the two to four largest sellers. The four largest sellers always have at least 80% of the total market. And in any given year, the largest single seller has at least 32% of the total market. By the usual measures of market concentration used by antitrust policy makers, this is a highly concentrated market. But notice that the dominant drug is only dominant for a short period of time. A1 is dominant in 1951; C3 is dominant in 1952 and 1953. In 1954 F6 has a whopping 59% of the market and maintains the number-one position through 1957. Then out of nowhere comes H10 which achieves 78% in 1958, maintaining a (diminishing) lead through 1960.

Note that the first two drugs to dominate the market were not even in the top four, a few years later. Although the market does not appear to be competitive at a moment in time, it is very competitive if one looks at it dynamically over time. This kind of competition has been described (I think by Rogge[6]), as "leap-frogging"

competition.

Foster (1986) claimed generality for overlapping s-curves of successive technological innovations. Figures A-1 through A-3 illustrate the general case, and illustrations from the textile industry. The figures are suggestive of a leap-frogging process.

Tables A-1 through A-3 offer a palliative for those who fear that the "destruction" part of Creative Destruction outweighs the "creative" part of Creative Destruction. The tables from, Cox and Alm (1992), illustrate that, while successive waves of innovation make some jobs obsolete, they also create a substantial number of new jobs. And a casual inspection of the jobs created and destroyed, by no means suggests that the quality of the jobs destroyed was higher than the quality of the jobs created.

Figures A-4 through A-6 present various evidence, from a variety of sources; all indicating that large size is no guarantee of future success. Figure A-4 from Foster and Kaplan, shows the 18 firms that are still among the largest 100, from the Forbes list of 100 largest firms in 1917. Of the 18, only two had a growth rate in 1987 that was higher than the average for U.S. firms. 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 (see Greenspan below) that the process of Creative Destruction has been speeding up in the United States.

Zook and Allen's Figure A-5 provides additional evidence of how hard it is for large firms to sustain growth. Figure A-6 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.

Figure A-7 from Martin Neil Baily is an intriguing graph that he presented at the exclusive Jackson Hole conference sponsored by the Kansas City Federal Reserve Branch, and attended by Alan Greenspan. (Baily is known in part for having served as Chair of President Clinton's Council of Economic Advisors). The graph shows a nice linear relationship between average hours worked, and productivity; except that there is one outlier that has much greater productivity than you would expect based on the other observations. That outlier is the United States. Baily suggests that a main cause of the greater productivity of the United States compared with Europe and Japan, is the greater "openness to creative destruction" of the United States. Harvard economist Martin Feldstein, who is sometimes mentioned as a likely successor to Alan Greenspan as Chair of the Federal Reserve, has stated a similar view at the Jackson Hole conference, and elsewhere (Feldstein 2003).

Elaboration of Creative Destruction

Several scholars have contributed to the elaboration of ideas related to Schumpeter's process of Creative Destruction. Among these scholars would be included Nathan Rosenberg, F.M. Scherer, and Richard Nelson. Due mainly to the limitations of time and space, in this section we focus on the elaborations of Creative Destruction by a scholar whose recent work has promised a coherent account of business innovation, and that offers lessons perceived by many business leaders to be of direct relevance to business practice. We will argue that the account also offers important lessons for public policy.

On 5/11/04 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[7] 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 as "bestselling"; former Intel CEO Andy Grove calls it "lucid, analytical---and scary", and Michael R. Bloomberg calls it "absolutely brilliant."[8] The *Financial Times* awarded the book a Global Business Award for being the "best business book" for 1998.

The Dilemma in Christensen's *Innovator's Dilemma* belongs to the incumbent firm. 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.

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. One fundamental problem emphasized in the second book is that incumbent firms face enormous pressures to maintain growth above market

expectations, in order to increase share values. But, as they argue, for a disruptive innovation to succeed, it must initially be managed in a way that is patient for growth. When large, incumbent firms try to manage a disruptive technology, they almost always are *im*patient for growth, and hence push the technology into mainstream markets before it is ready to succeed there.

In the second book, Christensen and Raynor distinguish two kinds of disruptive innovation. Low-end disruptions appeal to the low-end of customers of the current technology, who are currently over-served---they would prefer less quality and features, if they could get the product at lower cost. New-market disruptions provide the product to customers who are currently not customers at all.

In their advice to those seeking disruptive innovations to invest in, they recommend new-market disruptions, where possible, because those who pursue such innovations will face the least competition. This would suggest that the initial stages of Creative Destruction are not marked by direct confrontation of competitors, but by a firm filling a market space that no on else is able or willing to fill. Stigler in his Nobel Lecture, reached a similar conclusion with regard to academics---an economist most often advances the discipline, not by a clash with rivals, but by opening up a field that no one else was pursuing; in Stigler's case, the economics of information.

Increasing Relevance of Creative Destruction

[the] evident acceleration of the process of creative destruction, which has

> accompanied these expanding innovations and which has been reflected in the shifting of capital from failing technologies into those technologies at the cutting edge, has been remarkable. **Alan Greenspan** (as quoted by Useem, 2001)

Not only is Creative Destruction the central process of capitalism, but there are plausible arguments and credible evidence suggesting that the process is speeding up. We have already mentioned the shortening of the number of years the average firm lasts in the S&P 500. In addition, credible business books, such as Andy Grove's *Only the Paranoid Survive*, are rife with claims that the pace of change is quickening.

Often, the quickening pace is connected with the rise of information technology and the internet. Alan Greenspan has suggested a plausible account of what is going on:

> . . . a firm is inherently fragile if its value-added emanates more from conceptual as distinct from physical assets. . . . Trust and reputation can vanish overnight. A factory cannot. Alan Greenspan (quoted in Ip, p. A1)

Growing Acceptance Among Academics of Creative Destruction

Some subgroups of academic economists have continued to value the contributions of Schumpeter in the 50 years since his passing. In particular, those who study the History of Economic Thought still value Schumpeter's *History of Economic Analysis* as a major source in field. The work serves both as a reference unrivaled in

its comprehensiveness, and also as a continuing source of research questions. Similarly, those who study the Economics of Technology, view Schumpeter as a founder of their field, and as the source of several important research hypotheses.[9]

But when we detect a growing acceptance of Schumpeter's central message, we are not primarily referring to either of these two groups. Rather we mainly intend a broader group, of otherwise more mainstream economists who believe the broad features of Schumpeter's account of competition capture the kind of competition that is most important for understanding economic growth.

One economist often identified as solidly in the mainstream is Nobel-prize winner George Stigler. As in his note against Liebenstein, "The Xistence of X-efficiency," Stigler often defended the neo-classical, partial-equilibrium framework from heterodox criticism. His mid-career "Perfect Competition, Historically Contemplated" (1957) is devoted to an historical account of some of the main ways in which competition has been defined and discussed in economics through the mid-1950's. A secondary aim of the article is to argue for the usefulness and robustness of the competition concept, both in economic theory, and as a policy tool. Stigler does, however, grant that the concept will need to continue to evolve with the advance of economic theory. In particular, he suggests (p. 282) that the concept of competition's "natural affinity to the static economy" will require modification in order to apply competition to a dynamic economy. This discussion calls Schumpeter to mind, but Stigler does not mention him.

Early in his career, Stigler advocated government antitrust action to make

industry less concentrated, and more competitive. Later, he became much less supportive of antitrust. He claims that the main reason for his change of position was the work McGee at the University of Chicago law school, under Aaron Director, demonstrating that the paradigm case of antitrust action, the Standard Oil case, had been ill-founded in the sense that the greater efficiencies of the Standard Oil trust had benefited consumers.

But Stigler admitted that reading Schumpeter had provided a second reason for his change of position:

> . . ., Schumpeter painted an unconventional picture of the capitalistic process. The competition between the Pennsylvania and New York Central Railroads, he argued, might be sporadic and even trifling, but the competition to railroads provided by new transportation media such as trucks, automobiles, and airplanes really mattered. . . . We economists mostly rebelled against such heresy, but it left its mark. (Stigler, 1985, p. 101.)

A mainstream economist who has acknowledged the importance of Creative Destruction in even stronger terms is William Baumol, who has been described by Mokyr as "one of our most influential, original, and eminent economists for over half a century." In his essay on "Innovation and Creative Destruction," Baumol states (2001, p. 21) that the "clear message" of Creative Destruction "is that innovation and growth force obsolete technical configurations to be swept away without hesitation or remorse." He further acknowledges (2001, p. 21) that "Schumpeter surely does imply that without creative destruction we would be condemned to stagnation and forced to forgo the

improvements of living standards offered by technical progress." His book *The Free-Market Innovation Machine* (2002) consists largely of a discussion and formal modeling of aspects of Schumpeter's process of Creative Destruction.

Several younger economists loosely in the 'mainstream' have also recently argued for the importance of the process of Creative Destruction in understanding economic growth and productivity. Among these economists, all of whom have been mentioned earlier in the paper, are: Bradford DeLong, Larry Summers, Martin Neil Baily, and Martin Feldstein.

Several important examples may establish a presumption, but a larger sample of academics would strengthen the case. To provide such a sample, I decided to use the *Social Sciences Citation Index* to examine the citations over time to Schumpeter and to *Capitalism, Socialism and Democracy*. The book versions of the data only go back through 1966, so I used the online Web of Science version, which has been extended back through 1956.

Because Schumpeter is so often compared to Keynes, I collected comparable citation data for John Maynard Keynes and for *The General Theory of Employment, Interest, and Money*. (Some of the details of the citation analysis are discussed in the Appendix on Citation Issues that is located after the tables and graphs near the end of the paper.)

Figure 1 reports total citations per year to Schumpeter and to Keynes. What is most important for our purposes is Schumpeter's continuing increase in annual citations, even more than 50 years after his death. As far as the Keynes/Schumpeter

comparison, the numbers are remarkably close from 1956 through about 1974. From 1975 through 1986, the advantage is Keynes'. From 1987 through 2003, the advantage is Schumpeter's---dramatically so from 1994 onwards.

In Figure 2, we can compare the major works of each author. The *General Theory* dominates from 1956 through 1990, dramatically so from the mid-1970s through the mid-1980s. *Capitalism, Socialism and Democracy* dominates from 1994 onwards, with the gap growing.

Figure 3 shows the proportion of Schumpeter's citations that are citations of *Capitalism, Socialism and Democracy*. A couple of generalizations are suggested by the graph. The proportion seems generally to fall from 1956 through 1964, and generally to increase from 1970 onwards. Since we associate Creative Destruction mainly with *Capitalism, Socialism and Democracy*, the increasing proportion of citations to that book, might be interpreted as consistent with our claim that Creative Destruction is increasingly viewed as Schumpeter's central message.

Growing Acceptance Among Book Authors (Including Academics, Business Analysts, and Policy Analysts)

> No one in the interwar years was more brilliant, more clever than Keynes. Schumpeter, by contrast, appeared pedestrian---but he had wisdom. Cleverness carries the day. But wisdom endureth. **Peter Drucker**, 1986, p. 115.

The phrase "creative destruction" has stimulated a wide audience of thinkers and doers. No less than five books have appeared in recent years with "creative destruction" in the title (Cowan, 2002; Page, 2000; Foster & Kaplan, 2001; Nolan & Croson, 1995; McKnight, Vaaler & Katz, 2001). Three of these books are aimed squarely at effecting business practice, while the other two apply "creative destruction" to issues outside the usual concerns of economists.

Peter Drucker, who is often identified as the most respected management guru, has frequently praised Schumpeter's insights into entrepreneurship and Creative Destruction.[10] Andy Grove, the former CEO of Intel who also sometimes teaches at the Stanford business school, has paid homage to Schumpeter in his business best-seller *Only the Paranoid Survive*.

Thomas Friedman, three-time Pulitzer-Prize-winning foreign affairs columnist for the *New York Times*, has written a best-selling book on globalization entitled *The Lexus and the Olive Tree*. He identifies Schumpeter as the most important academic economist for understanding the modern global economy:

> If the defining economists of the Cold War system were Karl Marx and John Maynard Keynes, who each in his own way wanted to tame capitalism, the defining economists of the globalization system are Joseph Schumpeter and former Intel CEO Andy Grove, who prefer to unleash capitalism. (p. 11)

For Friedman, the main central message of Schumpeter is the concept of Creative Destruction:

> If your company or country, for social, cultural or political reasons, is not

> willing to let Schumpeter's creative destruction work as fast as today's turbomarkets, it will fall behind. (p. 213)

The example of Thomas Friedman, along with those mentioned earlier, increase the plausibility of the claim that there is a growing acceptance of Schumpeter's central message among intellectuals and practitioners. But it would be desirable to have a broader source of evidence on which to base the conclusion. In what follows in this section, I submit for your consideration, a new data source that may allow us to gather broader data on this issue.

On 10/23/03, Amazon introduced a new feature called "Search Inside the Book" (Wolf). *Wired* journalist Gary Wolf reported that as of that date, Amazon had over 120,000 books available through the feature. That amounted to more than 33 million pages, from more than 190 publishers, "including Wiley, Time Warner Book Group, Simon & Schuster, Inc., Random House, Inc., and many others" (Price). If a publisher submits a book to the "Search Inside" feature, then Amazon customers are able to search the entire contents of the book for pages where any word appears. The customers can then read the pages where the word appears, as well as the preceding two pages, and the following two pages. Since its debut, not much additional information has become available in the press about the coverage of the feature.

Since not much is known about the characteristics of the books that are included, we attempted to gauge the current breadth of inclusion. On 4/23/04 we downloaded the *New York Times* nonfiction hardcover and paperback best-seller lists that were to be published in the paper on 4/25/04. Of the 35 books listed under

"hardcover" only one could be used with the "Search Inside" feature. Of the 35 books listed under "paperback" 13 could be used with the "Search Inside" feature. Not much information is yet available from Amazon itself on the "Search Inside" feature. For reasons not entirely clear, Amazon's policy has been not to allow publishers to submit books electronically, instead requiring that publishers submit a physical copy of the book, that is then scanned in by Amazon. ("Frequently Asked Questions About Search Inside the Book")[11] This policy is puzzling because it would seem to gratuitously increase, though only slightly, the cost to the publisher to participate in the program. What is even more puzzling is that it also would seem to increase Amazon's costs to process the book, and to delay the book's appearance with the "Search Inside" feature.

In the long-run, the continued growth (and existence) of the feature would depend either on its increasing sales of the books, or on Amazon being able to charge for the feature's use, and pass some of the revenue on to publishers and authors. Apparently based on preliminary evidence, Amazon has claimed that, ceteris paribus, books with the "Search Inside" feature sell 9% more copies than books that lack the feature (Parsons).

Because the Amazon.com "Search Inside" resource is new, and relatively unexplored[12], the results reported here will be tentative, and subject to improvement. Since we knew there would be many more books that mention Schumpeter than we could examine in a first effort, we considered how to select a sample. Amazon permits the "hits" from a search to be ordered in a variety of ways, which as of 5/12/04 consist of: Featured Items; Bestselling; Avg. Customer Review; Price: Low to High; Price:

High to Low; Publication Date; Alphabetical: A-Z; and Alphabetical: Z-A. Given limited time, we wanted to examine books that by some measure were either influential or of high quality, so we rejected the alphabetical ordering.

When Amazon accidentally released the identity of anonymous readers submitting book rankings, it was revealed that many authors were ranking their own books (see: CNN.com, 2004). This naturally reduces the credibility of the "Avg. Reader Review" ordering. In addition there are often only a few or even zero readers who have ranked a given book. So we also rejected the "Avg. Reader Review" ordering.

We sought to learn from Amazon, what the ranking procedure was for the "Featured Items" ranking. But after a frustrating exchange of email, the Amazon customer service representative finally admitted that they would not share any information on this for competitive reasons.[13] So we settled upon the "bestselling" ranking. We do not put a high degree of confidence in this ranking either, since we were unable to learn much about it. We would have liked to have known how often it is updated, whether it includes all editions of a book, and the like. From our limited experience, we conclude that the "bestselling" ranking can change quite substantially over a period of as short as 10 weeks. (We suspect that the variability is greater than for other bestseller lists, such as the *New York Times*, but we have not checked this.)

On 2/29/04, a "Search Inside the Book" search for 'Schumpeter' yielded 2,692 hits, when ranked by the "bestselling" criterion. On 5/11/04, a "Search Inside the Book" search for 'Schumpeter' yielded 2,866 hits, when ranked by the "bestselling"

criterion. So over a period of about 10 weeks, 174 Schumpeter-referencing books were added to the "Search Inside the Book" feature. This represents a 6.5% increase over the period.

Table 1 lists the 204 books whose content has so far been evaluated. Rank1 indicates the rank as of 3/2/04 on the Amazon "Bestsellers" ordering of books with "Search Inside" that referenced Schumpeter. On 3/2/04 we recorded the top 100 such books. If a book appears in Table 1 with no entry under Rank1, that means either that the book did have the "Search Inside" feature on 3/2/04, or else that it was ranked lower than the top 100 on 3/2/04. Rank2 indicates the rank as of 4/30/04, on the Amazon "Bestsellers" ordering of books with "Search Inside" that referenced Schumpeter. Generally, any book was included in Table 1, if it either was among the 100 top-ranked books on 3/2/04, or was among the 200 top-ranked books on 4/30/04. About 15 books were eliminated from the initial table for one of the following reasons: they referred to some other Schumpeter besides Joseph (3 cases), they included Schumpeter in the bibliography without mentioning him in the text (7 cases), Amazon consistently displayed a "PAGES UNAVAILABLE - TRY LATER" error message during attempts to view the pages that referenced Schumpeter (4 cases), and there were no references to be found anywhere in the text (1 case).

If Schumpeter was mentioned on several pages of a connected discussion, then that was counted as one reference. Only if mentions of Schumpeter were in separate sections, or chapters, or were at least separated by several pages, were they counted as multiple references. In cases where there were 10 or fewer pages with mentions of

Schumpeter, all of these pages were examined. In the three cases where there were more than 10 pages with mentions of Schumpeter, a sample of the pages was examined from each connected collection of mentions. These three cases were: Foster and Kaplan's *Creative Destruction* with 26 mentions, Heilbroner's *The Worldly Philosophers* with 38 mentions, and Muller's *The Mind and the Market* with 67 mentions. In the infrequent cases where a reference could be placed in more than one category, a judgment was made of which category was the main one. Endnotes were not counted as separate references except in the infrequent cases where they included a discussion of Schumpeter that did not correspond to a Schumpeter reference in the main text. Mentions in bibliographies or in indexes, were not counted.

Table 2 provides the preliminary results of the Amazon data analysis. The main result is that a significant number of the references to Schumpeter are on issues related to Creative Destruction. Many of the references are from academics, but another large set are from practitioners---those who provide guidance for better governing, managing, and investing. Although many in the economics profession might disagree, I would argue that, ceteris paribus, it speaks well of an economist if practitioners find something in the economist's work that is useful to them.

What Economists Teach

We initially looked at a set of 19 recent introductory principles of microeconomics texts to see how often, and in what context, they made reference to

Schumpeter. We later eliminated the Willis text when we discovered that the index was rife with errors, and that the publisher Northwest Publishing, was a vanity press that had been brought to court for fraudulent practices. So the final sample reported in this paper consists of 18 texts with publication dates between 1996 and 2005. (All but three of the texts were published in 2001 or later.) We are currently in the process of acquiring several more texts, so that we might credibly claim to have in the sample all of the major U.S. principles of microeconomics texts.

We examined the indices of each text, recording all entries of the names of "economists" and on how many pages the economists were mentioned in the text. Table 3 presents the top 58 economists, ordered first by the number of texts that referred to them, and then within groups of equal number of texts, ordered by the total number of pages referring to them. So as to minimize the risk of imposing our own prior beliefs on the results, we used a very broad definition of "economist." In our initial collection of data we tried to include anyone who wrote on economic topics, or who is frequently associated with distinctive economic policies. The initial list includes many who would generally be classified as journalists, but none of these made the cutoff for inclusion in Table 3. The 58 economists include all of those who were referred to by three or more of the 18 texts in the sample.

It might be useful to write a few words justifying the inclusion of four names on the list, who many would argue should not be called "economists." Bill Gates in his *The Road Ahead*, has emphasized (p. 4) that he once had thought about becoming an economist, and that his "whole experience in the computer industry has been a series of

economics lessons." In chapter 8 on "Friction-Free Capitalism," in particular, he makes a plausible case that the internet may move the marketplace significantly toward Smith's ideal market. Ross Perot made a call for the importance of balanced budgets, the centerpiece of his colorful third-party run for the presidency of the United States. Ronald Reagan actually did major in economics (Reagan, p. 54), and more importantly he was very tightly associated with a set of views usually labeled "supply-side economics" and sometimes also labeled "Reaganomics." George Bernard Shaw is known mainly as a playwright, but also wrote *The Intelligent Woman's Guide to Socialism and Capitalism*, which Rochester economist Steve Landsburg has called (p. 316) "both readable and highly entertaining."

The results of our analysis of textbooks appear in Table 3. Schumpeter is mentioned in only three out of the 18 microeconomics principles texts that were examined.[14] 32 economists were mentioned in more texts than was Schumpeter. The three texts where Schumpeter was mentioned were: Case & Fair; Gottheil; and McConnell & Brue. Case & Fair (p. 299) link Schumpeter to Galbraith, in believing that higher levels of market concentration may lead to faster technological innovation. The discussion is very brief and does not provide an account of the process of Creative Destruction. The main Gottheil account is longer (pp. 262-265), but also focuses on the concentration issue, implying that Schumpeter favored monopolies mainly because he thought they would result in lower prices. Later in the book (p. 312), and more briefly, Gottheil does summarize the theory of Creative Destruction. The best treatment of Schumpeter, though brief, occurs in the McConnell & Brue text. They

provide a good discussion of the process of Creative Destruction, in a separate (non-core) chapter on "Technology, R&D, and Efficiency."[15] One may hope that their treatment of Schumpeter helps explain why McConnell & Brue is "the nation's best-selling economics textbook." (p. ix)[16]

Schumpeter's Impact on Antitrust

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, 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 (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 the growth in United States mobile-telecom labor-productivity. 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).

The Lexis-Nexis reference tool includes a searchable database of all Supreme Court Decisions.[17] 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. Table 6 presents the results. Most dramatically, Schumpeter is never mentioned in any of the 804 cases.[18]

Conclusions and Implications for Action

Schumpeter's central message is that the process of Creative Destruction is the key fact about capitalism; a fact that explains how capitalism produces innovations that provide longer lives and increasing goods and services to the average consumer.

Accumulating evidence supports the truth of Creative Destruction. Elaborations of the process of Creative Destruction, by Christensen and others, provide even more evidence of the importance of the process, and the details of how it works. More

broadly, Creative Destruction is being recognized as true and important by a growing number of academics and practitioners. We highlighted a few important, specific examples of academics and practitioners who have argued for the importance of the process. Beyond the examples, we present evidence of the broader, and increasing, influence of Schumpeter among academics and practitioners. For academics, we show that annual citations to Schumpeter have continued to increase more than 50 years after his death. (Since the mid-1990s annual citations to *Capitalism, Socialism and Democracy* have even exceeded annual citations to Keynes's *General Theory*.) For a combination of academics and practitioners, we document the variety, and large number, of recent books that refer to Schumpeter; references that are often related to some aspect of Creative Destruction.

Although the evidence for the importance of Creative Destruction is being increasingly recognized, the importance of Creative Destruction is not being very effectively communicated to a wider audience, nor is it being applied to relevant policy issues, such as antitrust. Only three out of 18 principles of microeconomics texts mention Schumpeter, and of those three, only one does a moderately good job of summarizing the process of Creative Destruction. Out of 804 Supreme Court decisions searched on Lexis-Nexis, Schumpeter receives zero mentions.

Figure 1: Schumpeter Versus Keynes: Total Citations Per Year to All Publications

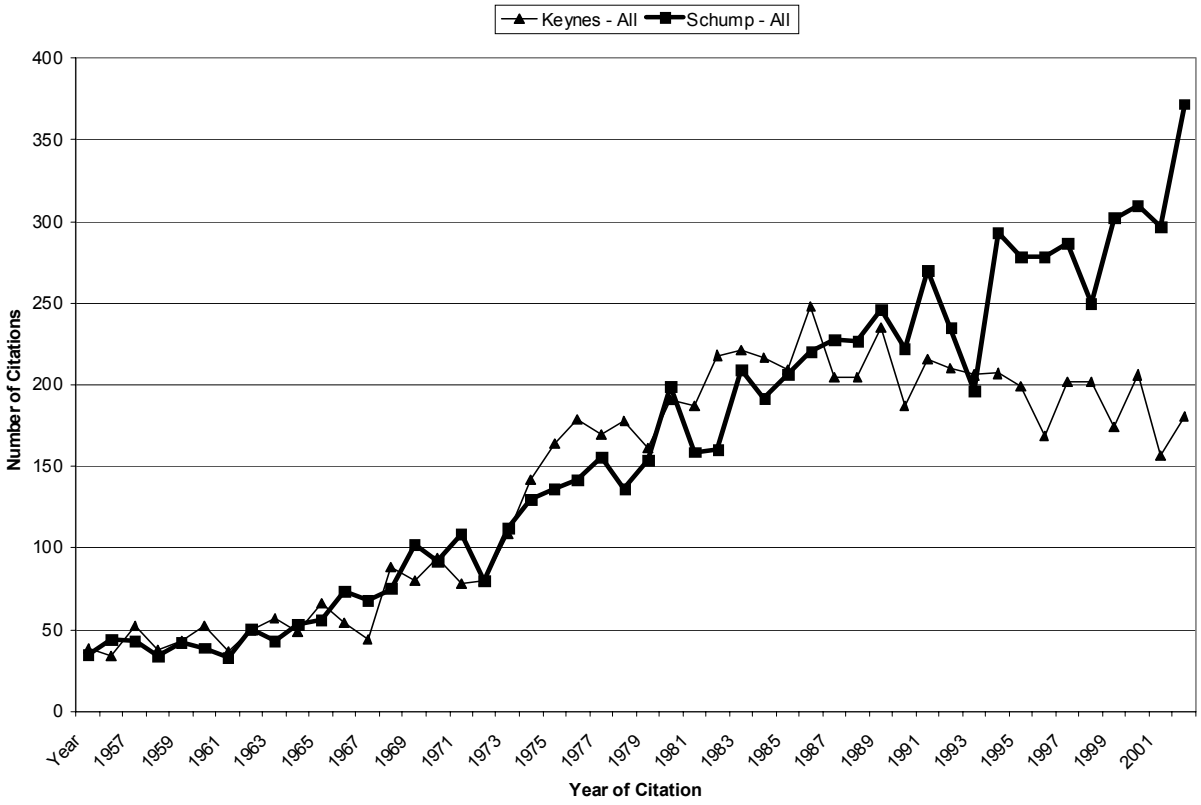


Figure 2: Schumpeter Versus Keynes: Citations Per Year to *Capitalism, Socialism and Democracy* Versus Citations Per Year to *The General Theory*

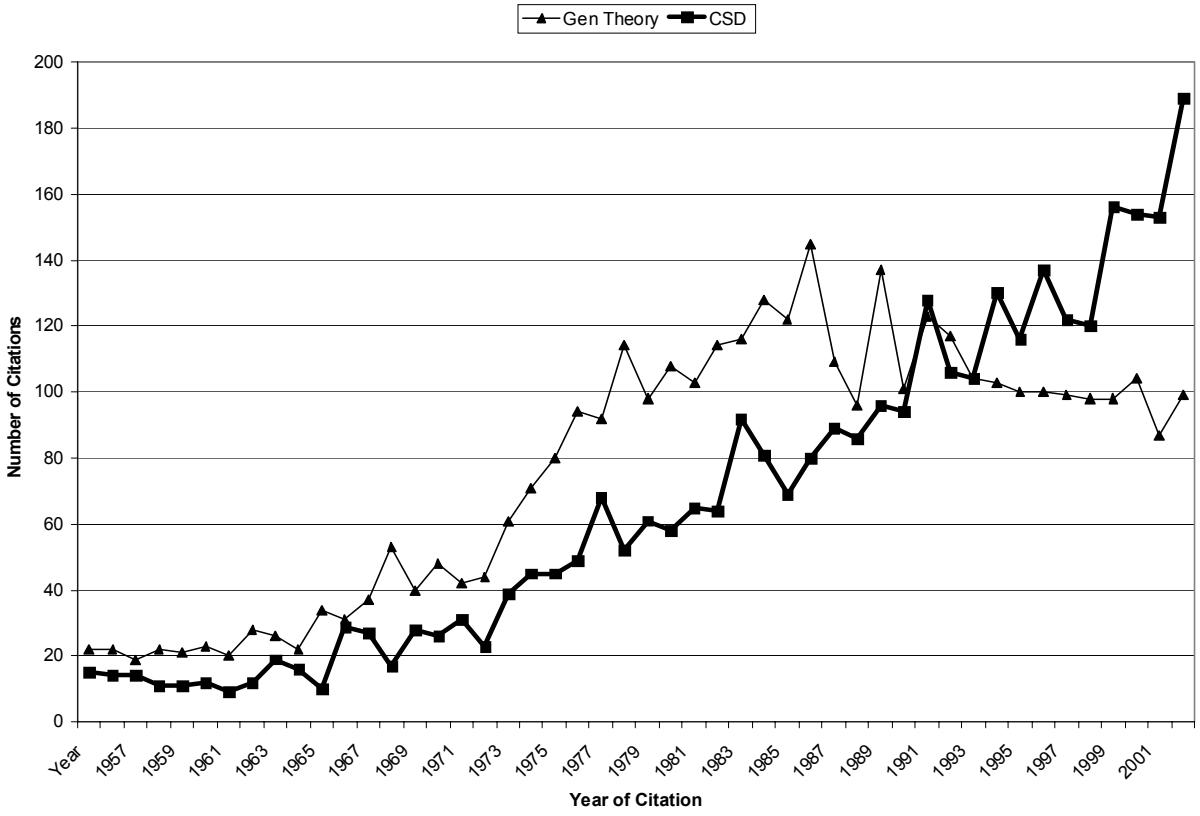


Figure 3: Proportion of All of Schumpeter's Citations that Are Citations to *Capitalism, Socialism and Democracy*

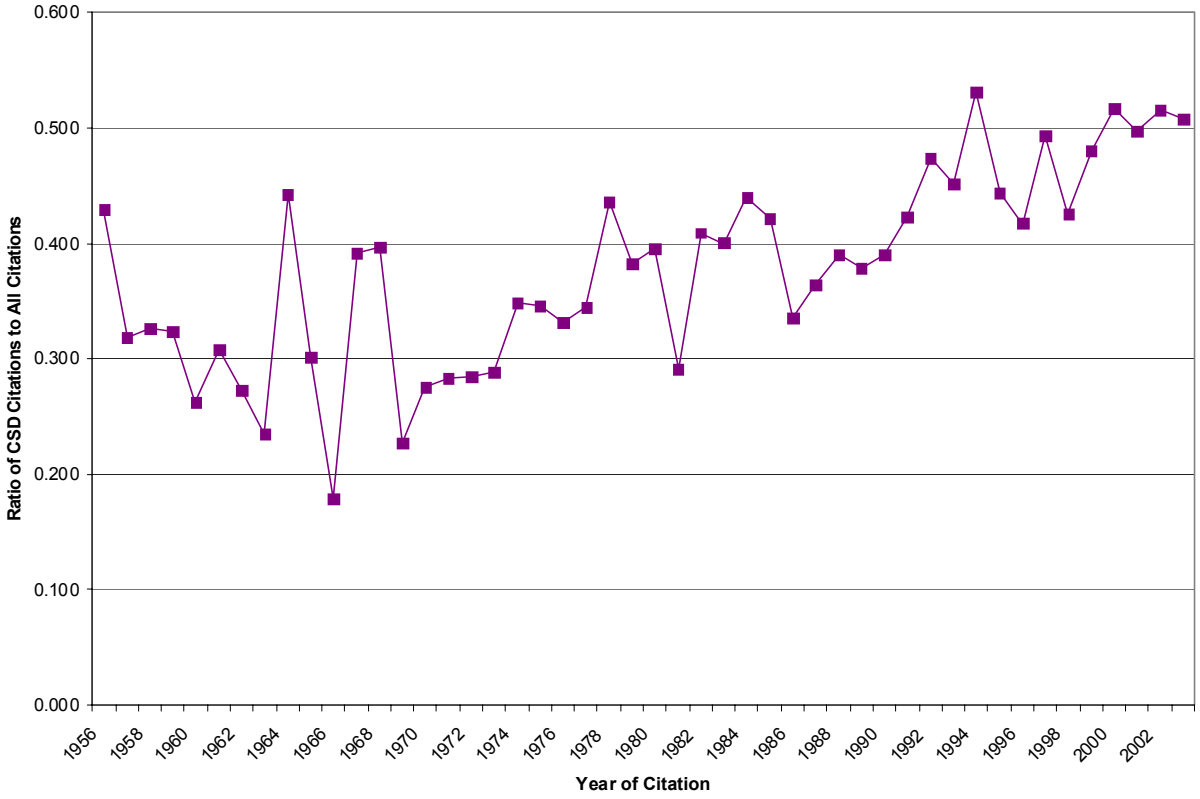


Table 1: Content Analysis of Amazon Book References to Schumpeter

[CD=Creative Destruction; EV=Evolutionary Method in Economics; HIS=In Role as Historian of Economic Thought; CYC= Long Cycles; SIZE =Hypothesis that Large Firms Innovate More; DYN=Dynamic (Leap-frogging) Competition; MISC=Miscellaneous]

Rank1	Rank2	Last	First	Title	Year	CD	EV	HIS	CYC	SIZE	DYN	MISC	misc notes
	60	Allen	Kathleen	The Complete MBA for Dummies	2000	1			1				
99	74	Anderson	Ross	Security Engineering: A Guide to Building Dependable Distributed Systems	2001							1	depressions perform valuable function of clearing out unfit companies, much like a forest fire
	193	Austin	Robert	Artful Making: What Managers Need to Know About How Artists Work	2003	1							
	80	Baker	George	The New Financial Capitalists: Kohlberg Kravis Roberts and the Creation of Corporate Value	1998	1							
	76	Bardwick	Judith	Danger in the Comfort Zone: From Boardroom to Mailroom--How to Break the Entitlement Habit That's Killing American Business	1995	1							
16	46	Bedbury	Scott	A New Brand World: 8 Principles for Achieving Brand Leadership in the 21st Century	2003	1							
	212	Bell	Daniel	The Cultural Contradictions of Capitalism	1996							3	(16 total references -- most seem to be sociology observations); "fiscal sociology" term; rise and fall of classes/families; vague reference to Schumpeter readings
	122	Bennis	Warren	The Future of Leadership: Today's Top Leadership Thinkers Speak to Tomorrow's Leaders	2001	1							
	155	Berlin	Isaiah	The Proper Study of Mankind: An Anthology of Essays	2000							1	"to realize the relative validity of one's convictions…distinguishes a civilized man from a barbarian" quote
	191	Berlin	Isaiah	Liberty: Incorporating Four Essays on Liberty	2002							1	"to realize the relative validity of one's convictions…distinguishes a civilized man from a barbarian" quote
	47	Bernstein	Peter	Capital Ideas: The Improbable Origins of Modern Wall Street	1993							3	first issue of Econometrica contained an article by Schumpeter; 2 mentions of his role as a Harvard professor
93	187	Bernstein	Peter	The Power of Gold: The History of an Obsession	2001							1	attraction of the gold standard was sybolic of prestige
23	55	Berry	Jon	The Influentials: One American in Ten Tells the Other Nine How to Vote, Where to Eat, and What to Buy	2003	1							
	131	Boaz	David	The Libertarian Reader	1998	1		2					(entire chapter on creative destruction)
	211	Boaz	David	Libertarianism: A Primer	1998	1		1					
11	12	Bogle	John	Common Sense on Mutual Funds: New Imperatives for the Intelligent Investor	2000	1						2	entrepreneurs are driving force; characteristics of successful entrepreneurs

Rank1	Rank2	Last	First	Title	Year	CD	EV	HIS	CYC	SIZE	DYN	MISC	misc notes
63	82	Bogle	John	John Bogle on Investing: The First 50 Years	2000	1							
8	5	Bonner	William	Financial Reckoning Day: Surviving the Soft Depression of the 21st Century	2003	1		1					
	204	Boorstin	Daniel	The Discoverers	1991			2					
	132	Bork	Robert	Slouching Towards Gomorrah: Modern Liberalism and American Decline	1997							2	definition of intellectual class; support for intellectual class
74	138	Bork	Robert	The Tempting of America	1997							1	listed in endnotes as a 'commentator' on American intellectuals being disproportionately liberal/leftist, no discussion of Schumpeter other than being listed in endnotes
4	8	Bornstein	David	How to Change the World: Social Entrepreneurs and the Power of New Ideas	2004	1							
	176	Bovard	James	Lost Rights: The Destruction of American Liberty	1995							1	"power wins, not by being used, but by being there" quote
34	15	Branden	Nathaniel	Six Pillars of Self-Esteem	1995	1							
	192	Brinton	Crane	The Anatomy of Revolution	1965			2					
84	64	Bruner	Robert	The Portable MBA	2002	2							
44	72	Buchholz	Todd	New Ideas from Dead Economists: An Introduction to Modern Economic Thought	1999			2				4	recession is good cold shower; econ growth requires entrepreneurs; capitalism cannot survive; monopolists good for economy
	90	Burns	James	Leadership	1982							2	democratic method - people do not rule; role of the intellectual
	206	Cannadine	David	The Decline and Fall of the British Aristocracy	1999							3	social classes in Britain; motivations for imperialism; ornamental positions in society
	89	Chakravorti	Bhaskar	The Slow Pace of Fast Change: Bringing Innovations to Market in a Connected World	2003	1							
	16	Chernow	Ron	Titan: The Life of John D. Rockefeller, Sr.	1999			1				1	monopolies can be beneficial in certain situations
	1	Christensen	Clayton	The Innovator's Solution	2003	1						1	Schumpeter's works address the "environment in which firms function"
7	25	Chua	Amy	World on Fire: How Exporting Free Market Democracy Breeds Ethnic Hatred and Global Instability	2002							1	democracy
	157	Cohen	Adam	The Perfect Store: Inside eBay	2002	1							
79	149	Collis	David	Harvard Business Review on Corporate Strategy	1999	1							
38	24	Coram	Robert	Boyd: The Fighter Pilot Who Changed the Art of War	2002	1							
	95	Cox	W. Michael	Myths of Rich & Poor: Why We're Better Off Than We Think	2000	1						1	Queen Elizabeth/silk stockings example of prices decreasing
43	37	Csikszentmihalyi	Mihaly	Good Business: Leadership, Flow, and the Making of Meaning	2003	3							
	160	Cusumano	Michael	Strategic Thinking for the Next Economy	2001	4						3	promoting adaptively efficient deployment of resources; Schumpeter is the 'source' of

Rank1	Rank2	Last	First	Title	Year	CD	EV	HIS	CYC	SIZE	DYN	MISC	misc notes
													the entrepreneurial school (in the ten schools of strategy formation); importance of innovator's monopoly profits
100		Czech	Brian	Shoveling Fuel for a Runaway Train: Errant Economists, Shameful Spenders, and a Plan to Stop Them All	2002							1	discussion of an economist who studied under Schumpeter
60	75	Das	Gurcharan	India Unbound: The Social and Economic Revolution from Independence to the Global Information Age	2002	1							
	145	Day	George	Wharton on Managing Emerging Technologies	2000	3						2	"creative recombinations"; role of the entrepreneur
39	34	De Soto	Hernando	The Mystery of Capital: Why Capitalism Triumphs in the West and Fails Everywhere Else	2000							1	property rights secure the creation of money
13	14	Drucker	Peter	Managing the Non-Profit Organization: Principles and Practices	1992							1	Schumpeter's three goals in life
48	20	Drucker	Peter	Innovation and Entrepreneurship	1993	2		1	1			3	"dynamic disequilibrium" brought on by entrepreneurs is 'norm' of a healthy economy; "benevolent monopolist"; general impact of entrepreneurs
	66	Drucker	Peter	Managing for Results	1993							1	profits disappear as soon as innovation becomes routine
	133	Drucker	Peter	Post-Capitalist Society	1994	1						3	property rights in the megastate; budget process in the fiscal state; fiscal state would undermine ability to govern
	190	Drucker	Peter	Management: Tasks, Responsibilities, Practices	1993							1	capitalism has become less accepted the more it succeeded (moral reasons)
	100	Drury	Shadia	Leo Strauss and the American Right	1999							1	democracy and irrationality of the people
	88	Dunn	Paul	The Firm of the Future	2003	2							
	208	Eccles	Robert	Doing Deals: Investment Banks at Work	1988							1	limitations of technology as one cause for the end of capitalism
2	3	Editors of World Almanac		The World Almanac and Book of Facts 2004	2003			1					
73	105	Elshtain	Jean Bethke	Just War Against Terror: The Burden of American Power in a Violent World	2003							1	peace and overcoming "bloody primitivism"
46	116	Emmott	Bill	20:21 Vision: Twentieth-Century Lessons for the Twenty-first Century	2003	2							
10	21	Enriquez	Juan	As the Future Catches You: How Genomics & Other Forces Are Changing Your Life, Work, Health & Wealth	2001	1							
86	135	Epping	Randy	A Beginner's Guide to the World Economy: Eighty-One Basic Economic Concepts That Will Change the Way You See the World	2001	1							
	121	Farnham	Alan	Forbes Great Success Stories: Twelve Tales of Victory Wrested from Defeat	2000	1							
22	175	Feldman	Noah	After Jihad: America and the Struggle for Islamic	2003							1	definition of democracy

Rank1	Rank2	Last	First	Title	Year	CD	EV	HIS	CYC	SIZE	DYN	MISC	misc notes
				Democracy									
45	110	Fine	Charles	Clockspeed: Winning Industry Control in the Age of Temporary Advantage	1999	1							
82	31	Finkelstein	Norman	Image and Reality of the Israel-Palestine Conflict	2003							1	every war can be justified as a defensive war in the modern world
71	151	Foster*	Richard	Creative Destruction: Why Companies That Are Built to Last Underperform the Market -- And How to Successfully Transform Them	2001	3							(26 total references to Schumpeter)
	103	Freeman	Samuel	The Cambridge Companion to Rawls	2002							1	democracy and electoral competition
3	4	Friedman	Thomas	The Lexus and the Olive Tree: Understanding Globalization	2000	3							
	98	Friedman	Milton	Monetary History of the United States, 1867-1960	1971							3	"economic organism was allowed to grow into its monetary coat"; Reserve policy's role in stock market boom and crash of 1920s; effect of crash on spending
	118	Friedman	Milton	Money Mischief: Episodes in Monetary History	1994			2					
	141	Fromm	Erich	The Sane Society	1990			1				2	definition of democracy; voter preferences
	114	Fukuyama	Francis	Trust: The Social Virtues and the Creation of Prosperity	1996	2							
	167	Fukuyama	Francis	The Great Disruption: Human Nature and the Reconstitution of Social Order	2000	1						1	capitalism ultimately undermines itself
87	124	Gabler	Neal	Life, The Movie: How Entertainment Conquered Reality	2000							1	Schumpeter was wrong -- it isn't any "ism" but entertainment that is the pervasive, powerful, ineluctable force of our time
67	84	Gardner	Howard	Good Work: When Excellence and Ethics Meet	2002	1							
52	125	Garreau	Joel	Edge City: Life on the New Frontier	1992			1					
66	68	Gharajedaghi	Jamshid	Systems Thinking: Managing Chaos and Complexity: A Platform for Designing Business Architecture	1999							1	listed with other economists grouped as those with classical theoretical perspectives on growth (no individual discussion of Schumpeter's theories)
9	6	Gilmore	James	The Experience Economy	1999	1							
70	49	Greaver	Maurice	Strategic Outsourcing: A Structured Approach to Outsourcing Decisions and Initiatives	1999	1							
26	28	Grove	Andrew	Only the Paranoid Survive: How to Exploit the Crisis Points That Challenge Every Company	1999						1		
	30	Hargadon	Andrew	How Breakthroughs Happen: The Surprising Truth About How Companies Innovate	2003		1						
92	48	Hart	Christopher	Doing a Literature Review: Releasing the Social Science Research Imagination	1999			1					(C.Wright Mills quote about Schumpeter)
	163	Harvey	David	Spaces of Capital: Towards a Critical Geography	2001	1			1				
20	17	Heilbroner	Robert	The Worldly Philosophers: The Lives, Times and Ideas of the Great Economic Thinkers	1987			1					(38 total references to Schumpeter) entire chapter on Schumpeter
	197	Heineman	Robert	American Government	1988							1	participatory democratic model is an ideal

Rank1	Rank2	Last	First	Title	Year	CD	EV	HIS	CYC	SIZE	DYN	MISC	misc notes
													not a reality
91	148	Henslin	James	Down to Earth Sociology: Introductory Readings	2003			1					(C.Wright Mills quote about Schumpeter)
	142	Hesselbein	et al	Leading for Innovation & Organizing for Results	2001	1							
	117	Hiltzik	Michael	Dealers of Lightning: Xerox PARC and the Dawn of the Computer Age	2000	1							
	205	Himmelfarb	Gertrude	One Nation, Two Cultures	2001	1						1	disintegration of the family - rationalization of capitalism extended to family life
6	22	Hirsch	Jeffrey	Stock Trader's Almanac 2004	2004							2	quotes on a calendar (innovation, capitalist process)
33	50	Hobsbawm	Eric	The Age of Extremes: A History of the World, 1914-1991	1996			1	1				
81	86	Hobsbawm	E.J.	Nations and Nationalism Since 1780: Programme, Myth, Reality	1992			1					
	177	Hobsbawm	Eric	Interesting Times: A Twentieth-Century Life	2003							1	author says all attempts to derive Keynes' or Schumpeter's economics from their sex lives are doomed
95	200	Hobsbawm	Eric	The Age of Revolution: 1749-1848	1989							1	brief mention of Business Cycles I in endnotes, no discussion in text
	129	Homer-Dixon	Thomas	Environment, Scarcity, and Violence	2001					1			
	189	Huber	Peter	Hard Green: Saving the Environment from the Environmentalists	2000	1							
76	51	Hughes	Arthur	Strategic Database Marketing: The Masterplan for Starting and Managing a Profitable Customer-Based Marketing Program	1994							1	distinction between inventions and innovations - inventions not worth much until someone invests capital in their development
41	32	Ineichen	Alexander	Absolute Returns: The Risk and Opportunities of Hedge Fund Investing	2002	1							
29	27	Investor's Business Daily		Investor's Business Daily Guide to the Markets	1996	1							
19	61	Jennings	Jason	It's Not the Big That Eat the Small…It's the Fast That Eat the Slow: How to Use Speed as a Competitive Tool in Business	2001	1						1	innovation causes established companies to lose profits which motivates additional innovation
30	29	Kahneman	Daniel	Choices, Values, and Frames	2000			1					
80	224	Kao	John	Jamming: The Art and Discipline of Corporate Creativity	1997	1							
71	151	Kaplan	Sarah	Creative Destruction: Why Companies That Are Built to Last Underperform the Market -- And How to Successfully Transform Them	2001	3							(26 total references to Schumpeter)
	169	Kash	Rick	The New Law of Demand and Supply	2002							1	"always start from the satisfaction of wants, since they are the end of all production"
101	83	Kauffman	Stuart	At Home in the Universe: The Search for Laws of Self-Organization and Complexity	1996	2							
	165	Kauffman	Stuart	Investigations	2000	2							

Rank1	Rank2	Last	First	Title	Year	CD	EV	HIS	CYC	SIZE	DYN	MISC	misc notes
	104	Kelly	Marjorie	The Divine Right of Capital: Dethroning the Corporate Aristocracy	2003	1							
56	35	Kindleberger	Charles	Manias, Panics, and Crashes: A History of Financial Crises	1989							2	Bank of England reserves; attributes South Sea bubble to speculation excess
1	2	Kiyosaki	Robert	Rich Dad's Guide to Investing: What the Rich Invest in, That the Poor and the Middle Class Do Not	2000	1							
	181	Klein	Maury	The Change Makers: From Carnegie to Gates, How the Great Entrepreneurs Transformed Ideas into Industries	2004							2	(19 total references to Schumpeter, mentioned repeatedly in prologue and first chapter, all references related to entrepreneurs in general); entrepreneurs - definition, characteristics, and function in economics
49	196	Koehn	Nancy	Brand New: How Entrepreneurs Earned Consumers' Trust from Wedgwood to Dell	2001							1	entrepreneurship
	106	Koestenbaum	Peter	Leadership: The Inner Side of Greatness, A Philosophy for Leaders, New and Revised	2002							1	definition of innovation
	113	Konner	Melvin	The Tangled Wing: Biological Constraints on the Human Spirit	2003	1							
	158	Kotler	Philip	Marketing Places	2002	1							
69	52	Laffont	Jean-Jacques	The Theory of Incentives: The Principal-Agent Model	2001			1					
	127	Lapin	Rabbi Daniel	Thou Shall Prosper: Ten Commandments for Making Money	2002	1			1				
55	214	Lawler	Edward	Treat People Right! How Organizations and Employees Can Create a Win/Win Relationship to Achieve High Performance at All Levels	2003	1							
64	292	Lee	Henry	Blood Evidence: How DNA is Revolutionizing the Way We Solve Crimes	2003	1							
	183	Lemert	Charles	Social Theory: The Multicultural and Classic Readings	1998			1					(C.Wright Mills quote about Schumpeter)
	71	Levitt	I.M.	Marketing Imagination: New, Expanded Edition	1986	1							
	44	Lind	Michael	The Radical Center: The Future of American Politics	2002	1			2				
	139	Lind	Michael	Vietnam: The Necessary War	2002							1	underrepresentative minority of public pays attention to politics
	194	Lind	Michael	Up From Conservatism	1997							1	capitalism will be destroyed by liberal intellectuals who impose socialism
	202	Linz	Juan	Problems of Democratic Transition and Consolidation: Southern Europe, South America, and Post-Communist Europe	1996							1	modern democracies are best served by elected politicians supported by professional bureaucrats
	182	Mann	Michael	The Sources of Social Power, Vol. 2	1993			1					
	130	Mariotti	Steve	The Young Entrepreneur's Guide to Starting and Running a Business	2000	1							
47	38	Marx	Karl	Capital: A Critique of Political Economy	1992			7					Schumpeter's critiques of Marxist ideas in the extensive intro/preface written by

Rank1	Rank2	Last	First	Title	Year	CD	EV	HIS	CYC	SIZE	DYN	MISC	misc notes
													Ernest Mandel (Marx himself didn't write about Schumpeter!)
	136	Marx	Leo	The Machine in the Garden: Technology and the Pastoral Ideal in America	1999	1							
	171	Mayer	Martin	The Fed: The Inside Story of How the World's Most Powerful Financial Institution Drives the Markets	2001							2	fixed habits become drag-chains quote; compensation for greater risk quote
	73	McGrath	Rita Gunther	The Entrepreneurial Mindset	2000	1						1	mention among list of economists who study entrepreneurship
12	11	McKinsey & Company		Valuation: Measuring and Managing the Value of Companies	2000	1							
	99	McKnight	Thomas	Will It Fly? How to Know if Your New Business Idea Has Wings…Before You Take the Leap	2003	1						1	Schumpeter is the father of learning about entrepreneurship
96	281	McTaggart	James	Value Imperative: Managing for Superior Shareholder Returns	1994	1							
21	77	Meyer	Christopher	It's Alive: The Coming Convergence of Information, Biology, and Business	2003	3							
31	59	Micklethwait	John	The Company: A Short History of a Revolutionary Idea	2003							1	soap quote about Lever brothers
98	119	Mills	C. Wright	The Power Elite	2000	2							
	154	Mills	C. Wright	The Sociological Imagination	2000			2				2	capitalism and democracy; mentioned in list of economists whose work the author considered
	57	Mintzberg	Henry	Strategy Safari: A Guided Tour Through the Wilds of Strategic Management	1998	1						2	importance of entrepreneurs who "carried out new combinations"; Schumpeter considered a source of the "entrepreneurial school" of economics
	161	Mirowski	Philip	More Heat than Light: Economics as Social Physics, Physics as Nature's Economics	1991			3					(15 total references to Schumpeter -- they all seem to be in the HIS category)
	107	Mitchell	Donald	The Ultimate Competitive Advantage	2003	1							
	128	Molotch	Harvey	Where Stuff Comes From	2003							1	author gives Schumpeter credit for the term "preanalytic visions" but author uses it in a different context
	188	Monge	Peter	Theories of Communication Networks	2003							1	concept of embeddedness -- economic actions are constrained by social structures
42	65	Morgan	Gareth	Images of Organization	1996	2							
88	210	Muller	Jerry	The Mind and the Market: Capitalism in Modern European Thought	2002			1				2	Lukacs critique of Schumpeter, Schumpeter's "brilliant" defense of capitalism
53	53	Naficy	Mariam	The Fast Track	1997							1	an early example of someone in the consulting profession
	162	Nairn	Alasdair	Engines that Move Markets: Technology Investing from Railroads to the Internet and Beyond	2001	1							
	18	Nalebuff	Barry	Why Not? How to Use Everyday Ingenuity to Solve Problems Big and Small	2003							1	it is possible to automate the process of innovation

Rank1	Rank2	Last	First	Title	Year	CD	EV	HIS	CYC	SIZE	DYN	MISC	misc notes
32	146	Nonaka	Ikujiro	The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation	1995						1		
85	87	North	Douglass	Institutions, Institutional Change and Economic Performance	1990	1		1				1	vague reference to his literature on technological change
	108	Novak	Michael	Business as a Calling: Work and the Examined Life	1996	1						2	definition of capitalism based on search for new things; creative enterprise is the heart of capitalism
90	97	Nozick	Robert	Anarchy, State and Utopia	1977							1	very brief reference to innovation
50	91	Ohrtman	Frank	Softswitch: Architecture for VoIP	2002	1							
	201	Orr	David	The Nature of Design: Ecology, Culture, and Human Intention	2002	1							
	93	Perkins	David	King Arthur's Round Table: How Collaborative Conversations Create Smart Organizations	2002	1							
18	23	Phillips	Kevin	Wealth and Democracy: A Political History of the American Rich	2003	2						3	speculation mania accompanies innovation
62	79	Pilzer	Paul Zane	God Wants You to Be Rich: How and Why Everyone Can Enjoy Material and Spiritual Wealth in Our Abundant World	1997	2						1	prediction of self-destruction of capitalism
14	13	Pollan	Michael	The Botany of Desire: A Plant's-Eye View of the World	2002							1	birth of a new business is attended by a speculative bubble
65	81	Porter	Michael	Competitive Advantage of Nations	1998	1					2		
	70	Postrel	Virginia	The Future and Its Enemies	1999	1						1	capitalism's success will lead to its downfall and destroy entrepreneurial freedom
	9	Prahalad	C.K.	The Future of Competition	2004							1	listed in bibliography but not discussed in text
24	33	Pring	Martin	Technical Analysis Explained: The Successful Investor's Guide to Spotting Investment Trends and Turning Points	2002				1				
89	67	Pring	Martin	Study Guide for Technical Analysis Explained: The Successful Investor's Guide to Spotting Investment Trends and Turning Points	2002				1				
	195	Pring	Martin	The All-Season Investor	1992				1				
	101	Quartz	Steven	Liars, Lovers, and Heroes: What the New Brain Science Reveals About How We Become Who We Are	2002							1	adversarial democracy and self-interest
102	207	Reid	T.R.	Confucius Lives Next Door: What Living in the East Teaches Us About Living in the West	2000	1							
	209	Robinson	James	The Corporate Practice of Medicine	1999						1	1	innovation is engine of productivity improvement and cost reduction
	180	Rohmann	Chris	A World of Ideas: The Dictionary of Important Ideas and Thinkers	2000							1	supply/demand equilibrium is always maintained over time
	123	Rorty	Richard	Contingency, Irony, and Solidarity	1989							2	"to realize the relative validity of one's convictions…distinguishes a civilized man from a barbarian" quote; commitment

Rank1	Rank2	Last	First	Title	Year	CD	EV	HIS	CYC	SIZE	DYN	MISC	misc notes
													criterion for civilization
	178	Sahlman	William	The Entrepreneurial Venture (The Practice of Management Series)	1999							3	innovation and entrepreneurship; entrepreneur "carries out new combinations"
35	26	Said	Edward	Culture and Imperialism	1994							3	imperialism
	150	Said	Edward	The Edward Said Reader	2000							1	reasons imperialism came about
	159	Sassen	Saskia	The Global City: New York, London, Tokyo	2001	1							
	143	Schrage	Michael	Serious Play: How the World's Best Companies Simulate to Innovate	1999	1						1	innovation is more an act of will than intellect
77	274	Shuman	Michael	Going Local: Creating Self Reliant Communities in a Global Age	2000	1							
5	10	Silbiger	Steven	The Ten-Day MBA: A Step-By-Step Guide to mastering the Skills Taught in America's Top Business Schools	1999	1							
	156	Simon	Julian Lincoln	The Ultimate Resource 2	1998			2					
25	36	Sowell	Thomas	A Conflict of Visions: Ideological Origins of Political Struggles	2002							2	lie for ideals quote, brief career in business was rare example of theorist-businessman
27	42	Sowell	Thomas	The Vision of the Anointed: Self-Congratulation As a Basis for Social Policy	1996			1					
	85	Sowell	Thomas	Inside American Education	1992							1	"power wins, not by being used, but by being there" (re: left-wing organizations on campuses)
	115	Sowell	Thomas	Civil Rights: Rhetoric or Reality	1985							1	only person's motivation we really know is our own
	137	Sowell	Thomas	The Quest for Cosmic Justice	2002							1	lie for ideals quote
	186	Sowell	Thomas	Classical Economics Reconsidered	1977			5					
36	43	Starr	Paul	Social Transformation of American Medicine	1984							1	modern hospital is a product of capitalism and the capitalist process
	184	Stern	Joel	The EVA Challenge: Implementing Value Added Change in an Organization	2001	1							
54	92	Stewart	G.Bennett	The Quest for Value	1991	1							
	112	Sugrue	Thomas	The Origins of the Urban Crisis	1998	1							
	153	Sull	Donald	Revival of the Fittest: Why Good Companies Go Bad and How Great Managers Remake Them	2003	1							
83	144	Swedroe	Larry	What Wall Street Doesn't Want You to Know: How You Can Build Real Wealth Investing in Index Funds	2000	1							
15	19	Swensen	David	Pioneering Portfolio Management: An Unconventional Approach to Institutional Investment	2000	1							
	203	Tedlow	Richard	Giants of Enterprise: Seven Business Innovators and the Empires They Built	2001	1							
	164	Teerlink	Rich	More Than a Motorcycle: The Leadership Journey at Harley-Davidson	2000	1							

Rank1	Rank2	Last	First	Title	Year	CD	EV	HIS	CYC	SIZE	DYN	MISC	misc notes
	172	Tucker	Robert	Driving Growth Through Innovation	2002							1	innovation is more an act of will than intellect
97	54	Utterback	James	Mastering the Dynamics of Innovation	1996	2				1	1		
57		Van De Ven	Andrew	The Innovation Journey	1999	2	1						
68	63	Van Osnabrugge	Mark	Angel Investing: Matching Startup Funds with Startup Companies -- A Guide for Entrepreneurs, Individual Investors, and Venture Capitalists	2000							1	person who provides financing bears the risk, not the entrepreneur
	140	Von Hippel	Eric	The Sources of Innovation	1997							1	reward for innovation is temporary monopoly control
51	39	Waldrop	Mitchell	Complexity: The Emerging Science at the Edge of Order and Chaos	1992	1	2					1	Schumpeter's quote about increasing returns no longer "a chaos"
	170	Watson	Peter	Modern Mind: An Intellectual History of the 20th Century	2002							1	summary of Schumpeter's view on capitalism -- it is static and profits come only from innovation
	185	Will	George	With a Happy Eye But…: America and the World, 1997-2002	2002							1	innovations reduce old status symbols (narrow social gap)
	134	Williamson	Oliver	The Mechanisms of Governance	1999						1	5	socialism can work; socialist planners can efficiently allocate resources; process of "handing on" benefits (2); socialist controversy
	174	Williamson	Oliver	The Economic Institutions of Capitalism	1998	1						3	American economy has had many significant organizational innovations; "fundamental impulse that sets and keeps capitalist engine in motion…" quote; capitalism can't survive
	198	Williamson	Oliver	The Nature of the Firm	1993							1	Robbins quote about Schumpeter and the banalities of the theory of production
28		Wilson	William	An Incomplete Education	1995	1							
78	45	Wolman	William	The Great 401K Hoax: Why Your Family's Financial Security is at Risk and What You Can Do About It	2003	1							
	152	Wolman	William	The Judas Economy: The Triumph of Capital and the Betrayal of Work	1997	1							
	62	Yankelovich	Daniel	The Magic of Dialogue	2001	1							
	96	Zakaria	Fareed	From Wealth to Power	1999							1	foreign policy and Europe's imperial powers
72		Zelizer	Viviana	The Social Meaning of Money: Pin Money, Paychecks, Poor Relief, and Other Currencies	1995							1	the meaning of money
61	41	Zingales	Luigi	Saving Capitalism from the Capitalists: Unleashing the Power of Financial Markets to Create Wealth and Spread Opportunity	2003							1	role of finance in the structure and success of modern industry
17	7	Zook	Chris	Profit From the Core: Growth Strategy in an Era of Turbulence	2001							1	earnings ability of any industry diminishes over time

For books with multiple authors, the table above lists only the first author, e.g., Foster and Kaplan. When there is an asterisk at

the end of the last name of the author, that indicates that the author listed was the first author, and there are additional authors. To keep the length of the bibliography manageable, the books in the above table, do not also appear in the bibliography, unless they are mentioned elsewhere in this paper.

Table 2: Summary Statistics from Content Analysis of Amazon Book References to Schumpeter

Type of Reference	Counts (# of books making reference)	Sum (# of references---may be more than one from same book, if separated)
Creative Destruction	102	128
Dynamic (Leap-frogging) Competition	6	7
Evolutionary Method in Economics	3	4
In Role as Historian of Economic Thought	29	48
Hypothesis that Large Firms Innovate More	2	2
Long Cycles	9	10
Miscellaneous	97	141

Table 3: References to Schumpeter in United States Microeconomic Principles Textbooks

Rank	Economist	# of Texts	Sum of Pages	Rank	Economist	# of Texts	Sum of Pages
1	Smith, Adam	18	92	30	Kahn, Alfred E.	4	4
2	Marx, Karl	12	23	31	Morgenstern, Oskar	4	4
3	Coase, Ronald	12	20	32	Winston, Clifford	4	4
4	Ricardo, David	11	34	33	Arrow, Kenneth J.	3	5
5	Keynes, John Maynard	11	17	34	Harrington, Michael	3	5
6	Stigler, George	10	12	35	Posner, Richard	3	5
7	Friedman, Milton	9	14	36	Samuelson, Paul	3	5
8	Gates, Bill	8	13	**37**	**Schumpeter, Joseph A.**	**3**	**5**
9	Marshall, Alfred	7	15	38	Dupuit, Jules	3	4
10	Rawls, John	7	12	39	Harsanyi, John C.	3	4
11	Bentham, Jeremy	7	11	40	Postrel, Virginia	3	4
12	Krueger, Alan B.	7	8	41	Akerlof, George	3	3
13	Mill, John Stuart	6	6	42	Axelrod, Robert	3	3
14	Nash, John	6	6	43	Bastiat, Frederic	3	3
15	Reagan, Ronald W.	5	13	44	Baumol, William J.	3	3
16	Becker, Gary	5	11	45	Benham, Lee	3	3
17	Malthus, Thomas R.	5	8	46	Berle, Adolf	3	3
18	Neumann, John von	5	6	47	Chamberlin, Edward	3	3
19	Buchanan, James	5	5	48	Colbert, Jean-Baptiste	3	3
20	Pigou, Arthur Cecil	4	6	49	Freeman, Richard B.	3	3
21	Card, David	4	5	50	Giffen, Sir Robert	3	3
22	Jevons, William S.	4	5	51	Heckscher, Eli	3	3
23	Pareto, Vilfredo	4	5	52	Medoff, James	3	3
24	Perot, Ross	4	5	53	Ohlin, Bertil	3	3
25	Shaw, George Bernard	4	5	54	Phillips, A. William (Bill)	3	3
26	Engels, Friedrich	4	4	55	Saffer, Henry	3	3
27	George, Henry	4	4	56	Simon, Julian	3	3
28	Hamermesh, Daniel	4	4	57	Solow, Robert M.	3	3
29	Hayek, Friedrich von	4	4	58	Tiebout, Charles M.	3	3

Table 4: United States Microeconomic Principles Textbooks Included

Authors	**Edition**	**Year**	**Publisher**
Arnold	5	2001	South-Western
Ayers and Collinge	Enhanced	2005	Pearson Education
Bade and Parkin	1	2002	Addison-Wesley
Baumol and Blinder	9	2003	South-Western
Boyes and Melvin	5	2002	Houghton Mifflin
Case and Fair	7	2004	Pearson Education
Frank and Bernanke	2	2004	McGraw-Hill/Irwin
Gottheil	4	2005	Thomson
Hall and Lieberman	3	2005	South-Western
Mankiw	3	2004	South-Western
McConnell and Brue	15	2002	McGraw-Hill
O'Sullivan and Sheffrin	3	2003	Pearson Education
O'Sullivan and Sheffrin *Activebook*	1	2003	Pearson Education
Parkin	3	1996	Addison-Wesley
Sexton	3	2005	South-Western
Stockman	2	1999	The Dryden Press
Taylor	3	2001	Houghton Mifflin
Tregarthen	1	1996	Worth Publishers

Table 6: Number of Supreme Court Antitrust Decisions that Refer to Selected Economists

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

Appendix

of Evidence Supporting Aspects of Creative Destruction

Table A-1: Leap-frogging in the Prescription Drugs

TABLE A

Drug Companies' Shares of the Diuretic Market, 1951–1960

Letter = company
Digit = trade name product

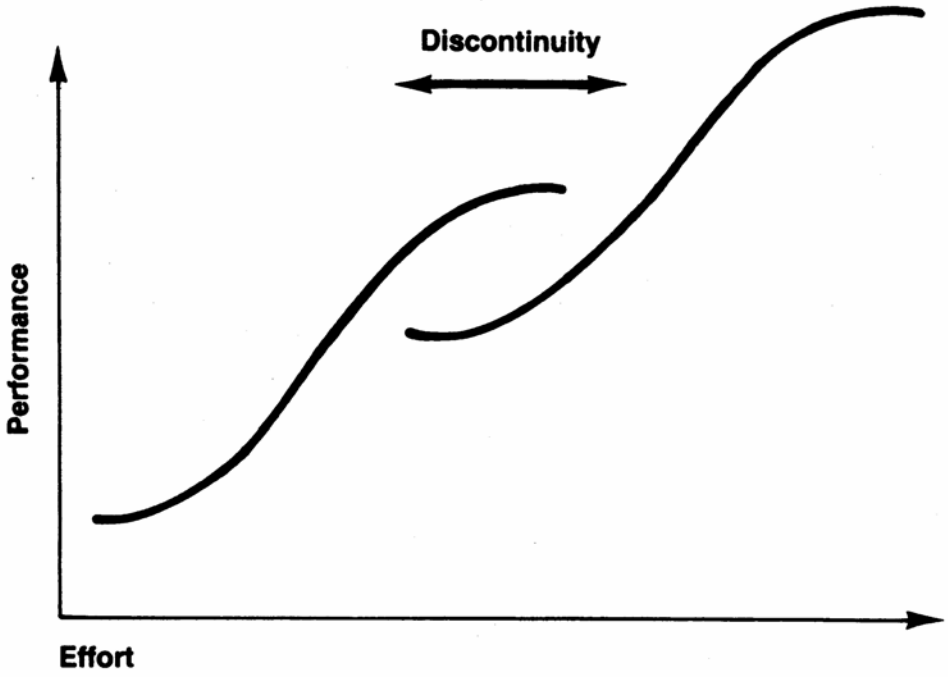
	A1	B2	C3	D4	F6	G8	G9	H10	H12	J13	Others
1951	32%	22%	19%	17%							10%
1952	9	25	37	18							11
1953		23	33	12	15%						17
1954		10	16	5	59						10
1955		6	13		61	13%					7
1956			11		67	9					13
1957			9		67		12%				12
1958					14			78%			8
1959					10			58	18%	7%	7
1960					8			45	23	7	17

Source: Marketing Division, Eli Lilly Company, Indianapolis, Indiana

Benjamin A. Rogge. Can Capitalism Survive? Indianapolis: Liberty Press, 1979.

(Source: Marketing Division, Eli Lilly Company, Indianapolis, Indiana, as reported in: Rogge, Benjamin A. *Can Capitalism Survive?* Indianapolis: Liberty Press, 1979, p. 21)

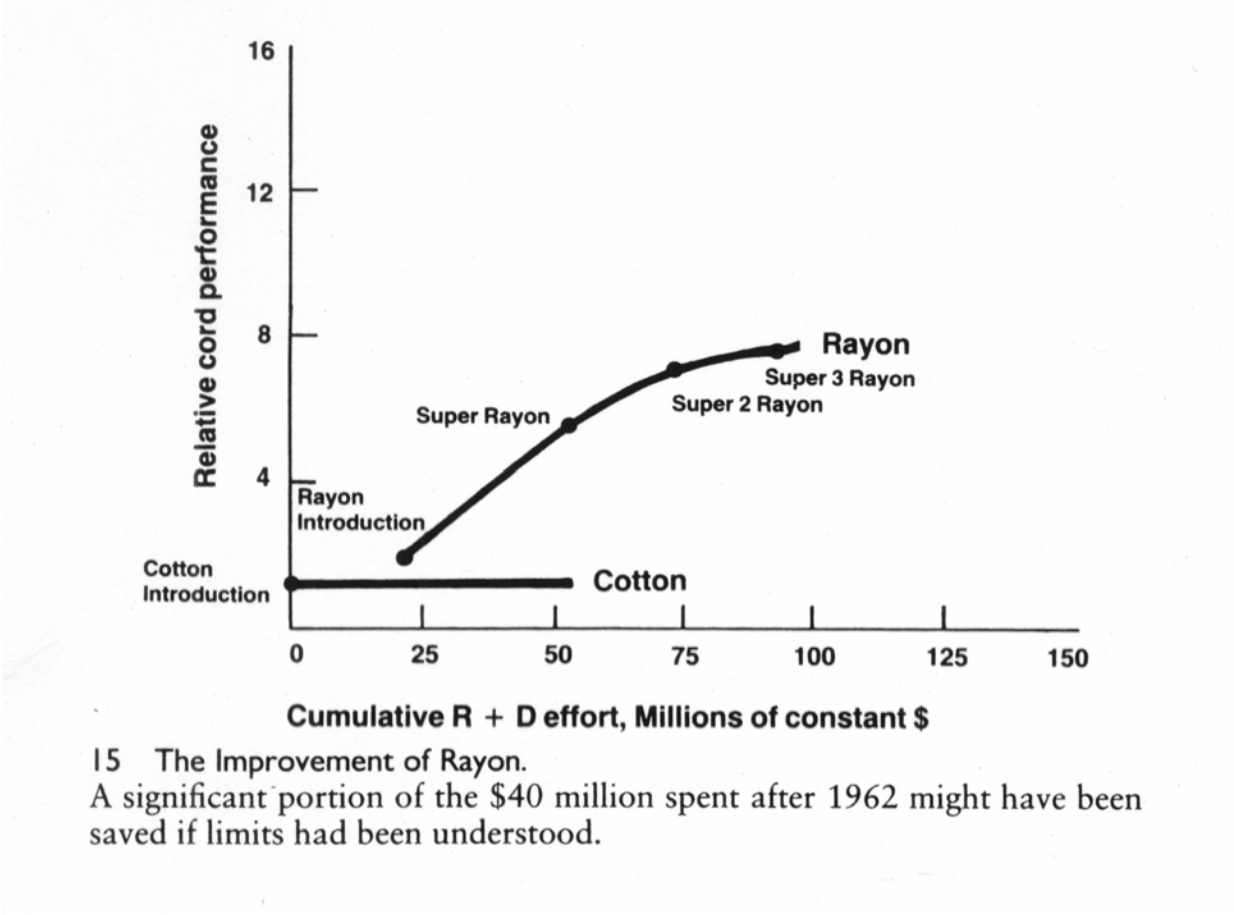
Figure A-1: Overlapping S-curves (Leap-frogging?)



12 S-Curves Almost Always Appear in Pairs.
Together they represent a discontinuity—when one technology replaces another.

Source: Foster, p. 102.

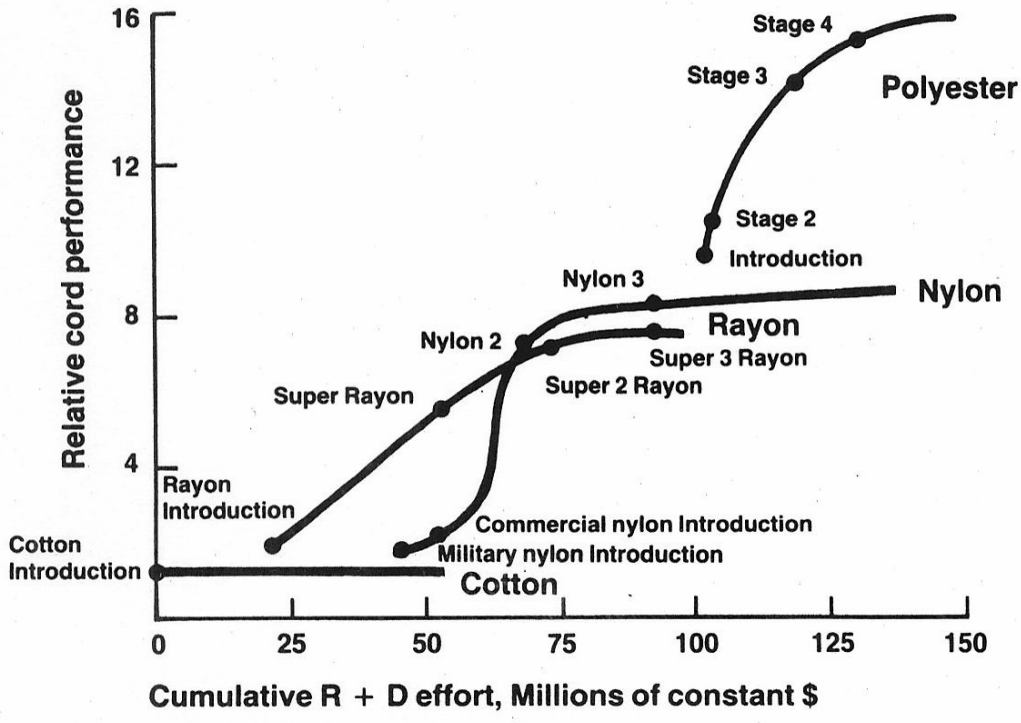
Figure A-2: Overlapping S-curves (Leap-frogging?)



15 The Improvement of Rayon.
A significant portion of the $40 million spent after 1962 might have been saved if limits had been understood.

Source: Foster, p. 122.

Figure A-3: Overlapping S-curves (Leap-frogging?)



16 From Cotton to Rayon to Nylon to Polyester.
Du Pont, not understanding where nylon was on its S-curve, got little for its last $75 million of R&D, while Celanese progressed much faster with less money because polyester was just starting its curve.

Source: Foster, p. 124.

Table A-2: "America's Top 30 Jobs Since 1900"

1900		1960		1991	
Job	*Workers*	*Job*	*Workers*	*Job*	*Workers*
Farmers	5,674,875	Retail salespersons and managers	4,351,867	Retail salespersons	6,200,000
Agricultural laborers	4,410,877	Farmers and farm managers	2,525,907	Teachers	4,029,000
General laborers	2,577,951	Teachers	1,683,667	Secretaries	3,791,000
Servants	1,453,677	Truck and tractor drivers	1,662,723	Truck drivers	2,666,000
Merchants	790,886	Secretaries	1,492,964	Farmers and farm managers	2,368,000
Clerks	630,127	Private household workers	1,281,740	Janitors and cleaners	2,126,000
Salespeople	611,139	Farm laborers	1,244,276	Bookkeepers	1,912,000
Carpenters	600,252	Manufacturing laborers	960,998	Engineers	1,846,000
Railroad workers	582,150	Bookkeepers	936,270	Cooks	1,779,000
Miners	563,406	Carpenters	923,837	Vehicle mechanics and repairers	1,778,000
Teamsters/coachmen	538,933	Waiters and waitresses	896,273	Nurses	1,712,000
Teachers	438,861	Engineers	871,582	Freight and stock handlers	1,688,000
Launderers	385,965	Vehicle mechanics and repairers	862,363	Police and guards	1,669,000
Dressmakers	346,884	Apparel and textile workers	808,378	Financial salespersons	1,612,000
Iron and steel workers	290,538	Construction workers	751,085	Wholesale commodities brokers	1,601,000
Machinists	283,145	Assemblers	686,754	Nursing aides, orderlies, attendants	1,506,000
Painters	277,541	Janitors and sextons	621,027	Accountants and auditors	1,446,000
Bookkeepers	254,880	Sewers and stitchers	617,029	Health technologists and technicians	1,379,000
Cotton mill workers	246,391	Cooks	597,056	Waiters and waitresses	1,355,000
Tailors	229,649	Typists	543,801	Computer programmers and operators	1,287,000
Blacksmiths	226,477	Machinists	515,532	Carpenters	1,277,000
Firefighters	223,495	Mfg. checkers, examiners, inspectors	514,135	Precision production supervisors	1,227,000
Shoemakers	208,903	Policemen and guards	513,200	Assemblers	1,119,000
Sawyers	161,624	Cashiers	491,906	Heavy equipment operators	1,022,000
Masons	160,805	Packers and wrappers	491,695	Child care workers	972,000
Housekeepers	155,153	Accountants and auditors	476,826	Engineering technologists and technicians	947,000
Printers	155,147	Deliverymen and routemen	438,002	Mathematical and computer scientists	923,000
Seamstresses	150,942	Painters	416,040	Postal clerks, mail carriers, messengers	923,000
Physicians	132,002	Launderers and dry cleaners	412,042	Groundskeepers and gardeners	890,000
Tobacco factory workers	131,452	Attendants (hospital, nursing home)	408,587	Professors	773,000
Total of top 30 jobs	22,894,100	Total of top 30 jobs	28,998,562	Total of top 30 jobs	53,823,000
(78.7 percent of employment)		(42.6 percent of employment)		(46.1 percent of employment)	
Total employment	29,073,233	Total employment	67,990,073	Total employment	116,877,000

DATA SOURCE: U.S. Bureau of the Census

(Source: Cox & Alm, "Churn." p. 6.)

Table A-3: "Creative Destruction Over the Past Century"

	People Employed		
Destruction	**Today**	**Yesterday**	
Railroad employees	231,000	2,076,000	1920
Carriage and harness makers	*	109,000	1900
Telegraph operators	8,000	75,000	1920
Boilermakers	*	74,000	1920
Milliners	*	100,000	1910
Cobblers	25,000	102,000	1900
Blacksmiths	*	238,000	1910
Watchmakers	*	101,000	1920
Switchboard operators	213,000	421,000	1970
Farm workers	851,000	11,533,000	1910
Creation	**Today**	**Yesterday**	
Airline pilots and mechanics	232,000	0	1900
Medical technicians	1,379,000	0	1910
Engineers	1,846,000	38,000	1900
Computer programmers/operators	1,287,000	*	1960
Fax machine workers	699,000	0	1980
Auto mechanics	864,000	0	1900
Truck, bus and taxi drivers	3,328,000	0	1900
Professional athletes	77,000	*	1920
TV and radio announcers	60,000	*	1930
Electricians/electronic repairers	711,000	51,000	1900
Optometrists	62,000	*	1910

* Less than 5,000

DATA SOURCE: U.S. Bureau of the Census

(Source: Cox & Alm, "Churn." p. 7.)

Table A-4: "New Technology: Labor Needed & Labor Released"

New Product	*Labor Needed*	Old Product	*Labor Released*
Automobile	Assemblers Designers Road builders Petrochemists Mechanics Truck drivers	**Horse/carriage** **Train** **Boats**	Blacksmiths Wainwrights Drovers Teamsters RR workers Canalmen
Airplane	Pilots Mechanics Flight attendants Travel agents	**Train** **Ocean liner**	RR workers Sawyers Mechanics Ship hands Boilermakers
Plastics	Petrochemists	**Steel** **Aluminum** **Barrels/tubs** **Pottery/glass**	Miners Founders Metalworkers Coopers Potters Colliers
Television	Electronic engineer Actors Reporters Electricians	**Newspaper** **Theater** **Movies** **Radio**	Reporters Actors
Computer	Programmers Computer engineers Electrical engineers Software designers	**Adding machine** **Slide rule** **Filing cabinets** **Paper**	Assemblers Millwrights Clerks Tinsmiths Lumberjacks
Fax machine	Programmers Electricians Software designers	**Express mail** **Teletype**	Mail sorters Truck drivers Typists
Telephone	Electronic engineers Operators Optical engineers Cellular technicians	**Mail** **Telegraph** **Overnight coach**	Postal workers Telegraph operators Coach drivers
Polio vaccine	Chemists Lab technicians Pharmacists	**Iron lung**	Manufacturers Attendants

DATA SOURCE: U.S. Bureau of the Census

(Source: Cox & Alm, "Churn." p. 8.)

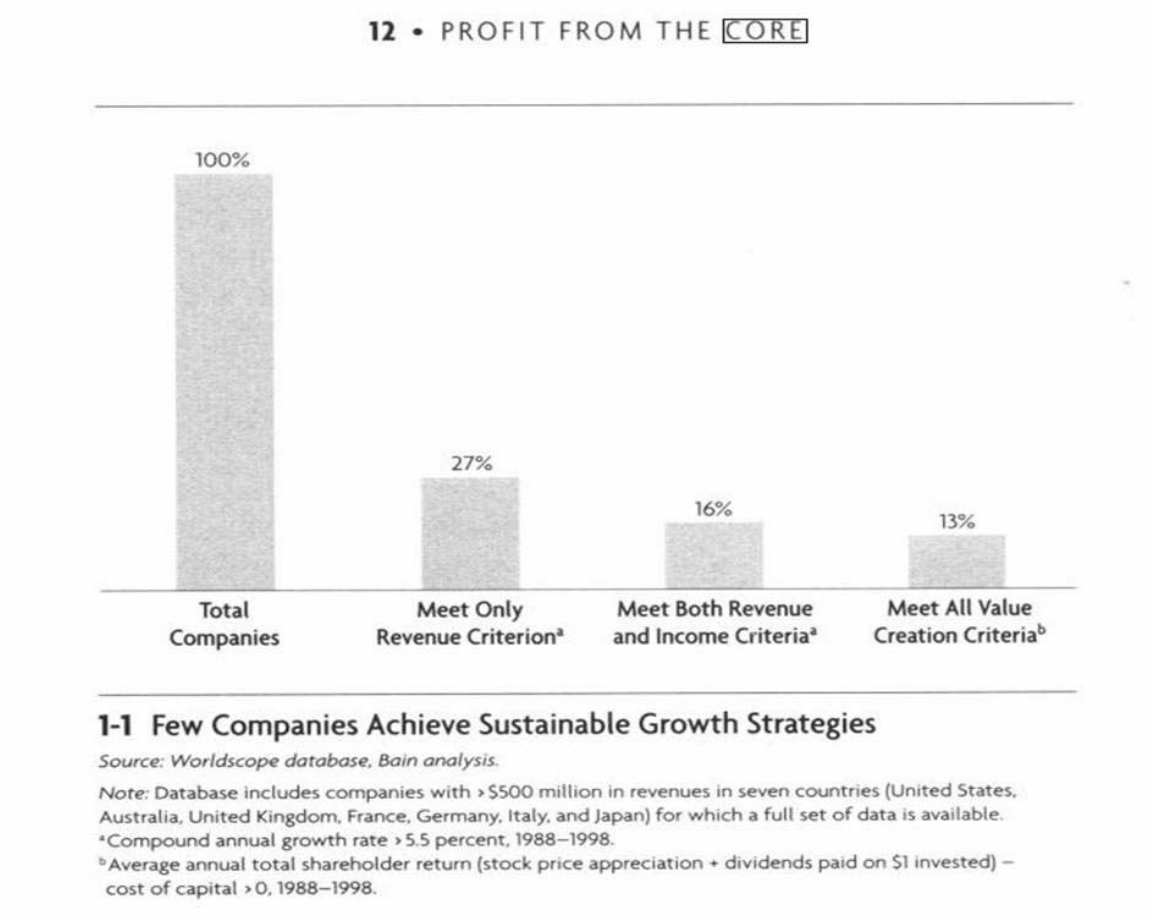
Figure A-4: Of 18 Out of 100 Who Remained in Largest 100, All But Two Underperform U.S. Average Growth



(Source: Foster & Kaplan, p. 8.)

Of *Forbes* 1917 list of 100 largest U.S. companies, only 18 remained in list of 100 largest in 1987. Of those only two (General Electric and Eastman Kodak) outperformed the U.S. average growth in market capitalization (CAGR).

Figure A-5: Few Companies Sustain Growth



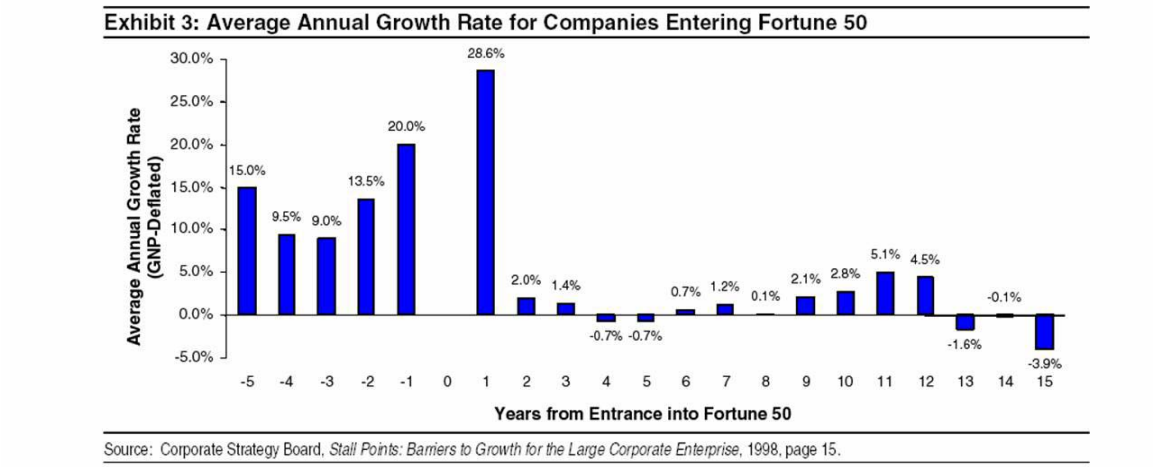
1-1 Few Companies Achieve Sustainable Growth Strategies

Source: Worldscope database, Bain analysis.

Note: Database includes companies with > $500 million in revenues in seven countries (United States, Australia, United Kingdom, France, Germany, Italy, and Japan) for which a full set of data is available.
[a] Compound annual growth rate > 5.5 percent, 1988–1998.
[b] Average annual total shareholder return (stock price appreciation + dividends paid on $1 invested) – cost of capital > 0, 1988–1998.

(Source: Zook, Chris and James Allen. *Profit from the Core*. Boston: Harvard Business School Press, 2001, p. 12.)

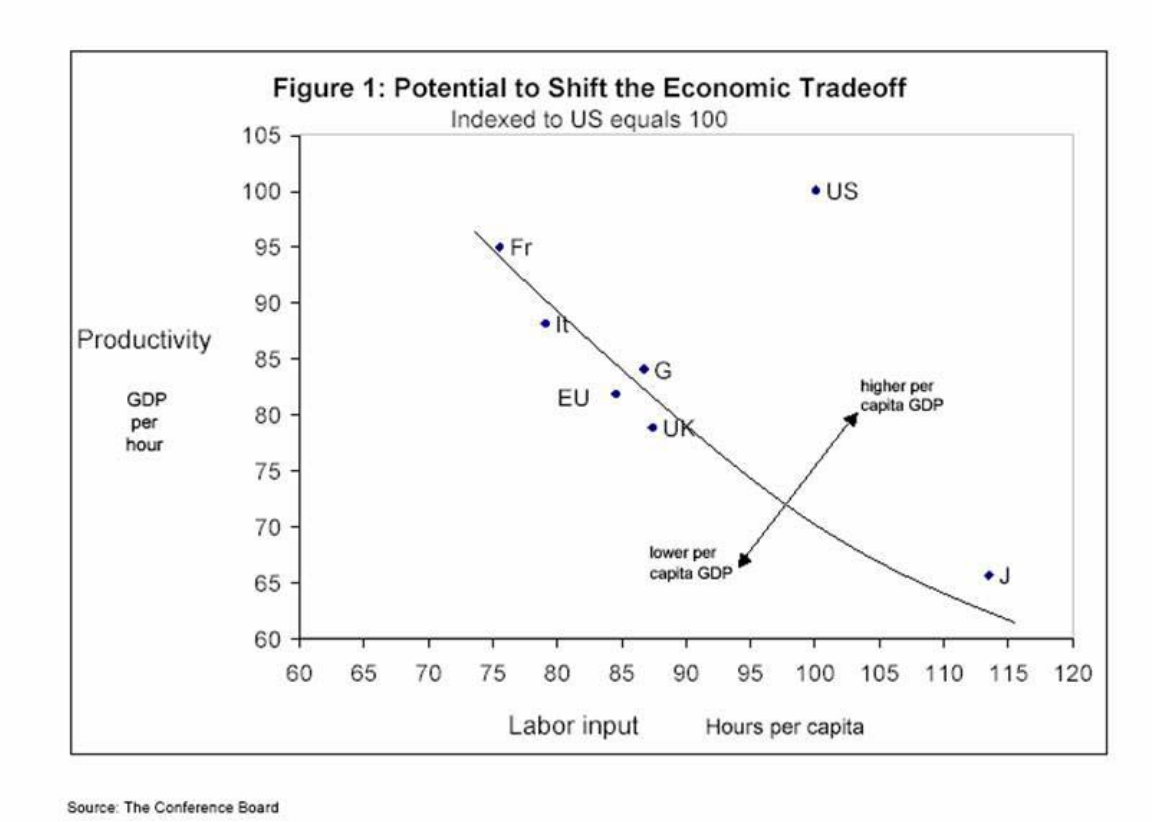
Figure A-6: Few Companies Sustain Growth



(Source: *Stall Points*, p. 15, as reproduced in:

http://www.csfb.com/home/research_and_commentary/html/docs/30996848.pdf)

Figure A-7: Explaining the Outlier: Openness to Creative Destruction



Notice that quantities in graph are "indexed to US equals 100." (Source: Baily)

Appendix

on Citation Issues

Our source for citations is primarily the "Web of Science" (WoS) database published by the Institute for Scientific Information, incorporating citations in the sciences, social sciences, arts, and humanities. For the present research, the primary advantage of the Web of Science version of the database is that it has been extended back through 1956 for the social sciences, in contrast to the 1966 starting date for the *Social Sciences Citation Index* (*SSCI*), which is the book version. Citation counts were available through the year 2003, and approximately the first three months of the year 2004. (The reported counts are through the end of 2003.)

For Schumpeter, I used the search term "Schumpeter, F*" in order to capture both citations using only his first name, and citations using both his first and middle initials. (The asterisk stands for 'wildcard' which is necessary because citers, and ISI data-entry persons, sometimes record the same author, or publication in differing forms.) For *Capitalism, Socialism and Democracy*, I used the search term "Cap* Soc*" which I judged would capture almost all, but not all of the citations to the book. (This method would miss, for example, citations to the German translation of the book, where the title begins with the letter "K".)

The search term for Keynes used was "Keynes, J*". For each year, I looked for, and excluded the small number of citations to J.M. Keynes' father: John Neville Keynes. For the *General Theory*, I searched under the search terms "Gen* The*".

Although it is well-known that citations are highly correlated with other measures of intellectual distinction and productivity (e.g., Diamond 1986), it is also well-known that they are not a perfect measure.

Another potential imperfection in the citation data results from what is sometimes described as citation inflation: that the secular trend has been for the average citations per article to rise. But it is difficult to distinguish whether a general secular increase in citations represents a decline in the average value of a citation, or an increase in the average quality of an article. In this paper we concur with Hall et al (2000, p. 36) who suggest that taking out time effects ". . . would drastically reduce the variance in the data, probably throwing out a good part of the baby with the bathwater."

Footnotes

*I first encountered Schumpeter at Wabash College in a wonderful course on *Capitalism, Socialism and Democracy* taught by Ben Rogge. George Bittlingmayer provided a gold mine of ideas, sources, and information on Schumpeter's non-role in antitrust policy. I am grateful for excellent and substantial research assistance on this project from Angela Kuhlmann. I received assistance on Excel issues from Jeanette Medewitz. A couple of lines of one of the footnotes, and several lines from the Appendix on Citation Issues, have been adapted from Diamond, 2004a & 2004b. The current paper was prepared for presentation at the biennial meetings of the International Schumpeter Society in Milan, Italy from June 9-12, 2004.

[1] See: Swedberg, 1991, p. 77.

[2] Samuelson remarks: "Remember this, though: In chess you are only as good as your worst move. In creative science you are as good as your best moves." (Samuelson, 2003, p. 467)

[3] Nathan Rosenberg seems to agree that Creative Destruction is the central message in the following passage:

> In my own reading, this deserves to be regarded as the central message of *Capitalism, Socialism and Democracy*. Capitalists survive, if they survive at all, by learning to live in, and to participate in, a "perennial gale of creative destruction. . . . The problem that is usually being visualized is how capitalism administers existing structures, whereas the relevant problem is how it creates

and destroys them." Rosenberg, 1994, p. 46 [the quote from Schumpeter is from p. 84]

[4] Others have usefully summarized the process of Creative Destruction, e.g., Rogge.

[5] A somewhat similar remark can be found in Smith: ". . . the accommodation of an European prince does not always so much exceed that of an industrious and frugal peasant, as the accommodation of the latter exceeds that of many an African king, the absolute master of the lives and liberties of en thousand naked savages." (Smith, p. 12)

[6] I have not found "leap-frog competition" in Schumpeter. Nor have I found it in Rogge's essay "Can Capitalism Survive?" But I believe Rogge used the phrase in his lectures on *Capitalism, Socialism and Democracy* at Wabash College in the late 1960s and 1970s.

[7] Christensen is currently the Robert and Jane Cizik Professor of Business Administration at the Harvard Business School, is reputed to command a $40,000 speaking fee, and has his own "Guru trading card" on the *Business 2.0* web site. Christensen's initial background was in economics, which was his undergraduate major, and in which he received a masters from Oxford where he attended as a Rhodes Scholar.

[8] Former Ameritrade CFO Robert Slezak mentioned before his talk to my fall 2000 Executive MBA class that Ameritrade founder Joe Ricketts had asked all of his senior management to read *Innovator's Dilemma*.

[9] Mansfield credits Schumpeter with founding the field (1995, I, p. ix) Rosenberg has gone so far as to say: " . . . the study of technological innovation . . . still consists of a

series of footnotes upon Schumpeter." (Rosenberg 1982, p. 106) Griliches (R&D, ..., 2000, p. 45) lists Schumpeter with four other "major" early economists who recognized the importance of technological innovation. Granstrand notes that "J. Schumpeter is without doubt the father of the field in terms of citation appearance and influence upon others, as is widely acknowledged." (Granstrand, 1994, p. 19)

[10] Steve Forbes attributes the increased attention to Schumpeter, largely to Drucker's article:

> Almost everyone today is aware of the phrase of another Austrian-born economist, Joseph Schumpeter: "creative destruction," which describes the process in a capitalist economy whereby new technology and new companies messily supplant the old. Nearly 20 years ago Laury realized that 1983 would mark the centennial birthday of not only the towering John Maynard Keynes but also the obscure Joseph Schumpeter. The result was FORBES' commissioning Peter Drucker to write about these two extraordinary men. The landmark cover story started the process of bringing Schumpeter out of the shadows. (Forbes, 2001)

Drucker himself seems to share Forbes' view of the article's impact:

> Of all my essays this may have had the greatest impact---and where I least expected it, that is among economists. Schumpeter was of course, all along a very big name in economics. Economists bowed their heads when his name was mentioned. But few actually read him. This essay touched off a "Schumpeter boom." (Drucker, 1986b, p. ix)

[11] On an FAQ page, Amazon provides publishers some information on the "Search Inside the Book" feature. ("Frequently Asked Questions About Search Inside the Book.") A couple of relevant entries are:

> **How do I submit books electronically?**
>
> Currently, we only accept physical copies of approved Search Inside the Book titles.
>
> **Once I submit my books, how long will it take until they appear on the Web site?**
>
> We try to add all new books to the Search Inside the Book program as quickly as possible. Typically, it takes three to five weeks from when we receive a book until it appears on Amazon.com.

[12] Although the customers who bought this book also bought" feature has been used to compile evidence that politically the United States is polarized into two distinct groups (see: Eakin).

[13] On 2/29/04 I sent my third email to Amazon customer service:

> I still would like to know the criteria that Amazon uses when they order books according to a "Featured items" ordering? The "Featured items" list is much different than, say, the "Bestsellers" list. So isn't it possible for you to explain how you come up with it?

On 3/1/04 "Erik T." of Amazon customer service emailed me the following reply:

> Unfortunately we cannot provide you with the information you are requesting. Due to the competitive nature of our business, our policy is not to give out information on the inner workings of our company.

[14] I accidentally noticed that one textbook, Makiw, included (p. 368) a brief mention of Creative Destruction in the context of a quote from Larry Summers, though Schumpeter is not mentioned and the phrase "creative destruction" does not appear in the index. I am also aware that one of the textbooks that I have not yet obtained to examine, viz., Samuelson and Nordhaus, does include several pages that mention Schumpeter.

[15] By "non-core" I mean outside of those chapters that would be thought mandatory for a professor to teach by most economics departments. This is my judgment.

[16] After some search, and consultation with a senior reference librarian, I was unable to find published statistics on economics textbook market shares. (In the future, it may be possible to obtain some information on this issue from the sales rank among textbooks on Amazon.com).

[17] We are 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.

[18] George Bittlingmayer directed us 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)

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