

The Academic-Industry Research Network

# Apple's Changing Business Model: What Should the World's Richest Company Do with All Those Profits?

AIR Working Paper #13-07/01

William LAZONICK, Mariana MAZZUCATO & Öner TULUM

Cambridge, Massachusetts  
July 2013

*Corrected on 09/03/2013*



## Abstract

Apple Inc. stands out as the world's most famous, and currently richest, company. To the general public, Apple is known for three things: its intriguing CEO Steve Jobs, who has achieved iconic status in death as in life; its amazing iOS products, especially the iPhone and the iPad, and their predecessor the iPod, which have literally placed sophisticated technology in the hands of the masses; and its stratospheric stock price, which even when in March 2013 it had dropped to 63 percent of its September 2012 peak, gave Apple the highest market capitalization of any company in the world. As a result of its phenomenal success, at the end of fiscal 2012 Apple had \$121 billion in liquid assets. In April 2013 the company committed to distributing as much as \$100 billion to shareholders in stock buybacks and cash dividends by the end of calendar 2015. By employing the theory of innovative enterprise to analyze how over the course of its 37-year history Apple became so profitable, we argue that there is no economic justification from a risk-reward perspective for this distribution to Apple's shareholders. Taxpayers and workers have superior claims on these profits. In analyzing by whom value is created as a basis for considering for whom value should be extracted, we raise the implications of Apple's changing business model for the future of innovation at this heretofore exceptional American company and even in the U.S. economy as a whole.

## Highlights

- The only time that Apple Inc. raised capital from public shareholders was \$97 million in its 1980 IPO.
- Over its 37-year history, Apple's value creators have been its employees and suppliers as well as government agencies (and hence taxpayers) that have invested in Apple's critical technologies.
- Yet in April 2013 Apple announced a program to repurchase \$60 billion of its own shares and also distribute \$40 billion in dividends by the end of calendar 2015.
- The main beneficiaries of this massive value extraction will be stock-market speculators and manipulators, including hedge fund operators who have nothing to do with the company's productive capabilities and Apple's top executives who should be charting the company's innovation strategy.
- Employing the theory of innovative enterprise, we ask whether innovation remains Apple's end, or conversely whether its financialized behavior means the end of Apple innovation.

## 1) Apple's phenomenal growth and profits

In the second decade of the 21<sup>st</sup> century, Apple Inc. stands out as the world's most famous, and currently richest, company. To the general public, Apple is known for its intriguing CEO Steve Jobs, who has achieved iconic status in death as in life;<sup>1</sup> its amazing iOS products, especially the iPhone and the iPad, and their predecessor the iPod, which have literally placed highly sophisticated technology in the hands of the masses; and its stratospheric stock price, which, even when in March 2013 it had dropped to 63 percent of its September 2012 peak, gave Apple the highest market capitalization of any company in the world.<sup>2</sup> As a result of its phenomenal success, at the end of fiscal 2012 (year end September 29) Apple had \$121.3 billion in liquid assets: \$10.7 billion in cash and cash equivalents, \$18.4 billion in short-term marketable securities, and \$92.1 billion in long-term marketable securities (Apple 10-K 2012, 44).

How did Apple achieve this exalted position? And what are the implications for the future of the company, and the U.S. economy in which it is based, of its announcement on April 23, 2013 of a program to distribute \$100 billion in cash to shareholders – \$40 billion in cash dividends and \$60 billion in stock repurchases – by the end of calendar 2015? What does Apple's changing business model mean for the future of industrial R&D; the role of the state in supporting, and even initiating, investment in new technologies; and the relation between corporate resource allocation decisions and the performance of economy in which the company grew and in which it as a corporate entity still resides?

In this paper, we lay a foundation for addressing these issues in the case of Apple Inc. by employing "the theory of innovative enterprise" to analyze the relation between Apple's changing business model and its economic performance (for other applications of this perspective, see Lazonick, 2009a; Lazonick and Tulum, 2011; Lazonick and Mazzucato, 2013). A business model entails the interaction of a company's strategy, organization, and finance. Through strategy, a company chooses the products with which it will compete and processes through which it will produce those products. Through organization, a company mobilizes the capabilities of people in a hierarchical and functional division of labor, often extending beyond the boundaries of the firm, to transform purchased inputs into sold outputs. Through finance, a company sustains this transformation process until it can generate financial returns.

In the theory of innovative enterprise, the combination of strategy, organization, and finance seeks to generate higher quality products at lower unit costs than were

---

<sup>1</sup> Steve Jobs died of pancreatic cancer on October 5, 2011, at the age of 56.

<sup>2</sup> Apple's stock price reached a peak of \$705 on September 21, 2012. On March 29, 2013, its stock price closed at \$443. The company's market capitalization on that date was \$415.7 billion, ahead of Exxon Mobil with a market cap of \$403.7 billion. In third place was Google at a mere \$261.8 billion.

previously available (Lazonick, 2010 and 2013c). The innovation process is uncertain, collective, and cumulative, and as a result requires strategy, organization, and finance. Given the uncertain character of the innovation process, investment in innovation depends on the abilities and incentives of executives who exercise *strategic control* over the allocation of company resources. Given the collective character of the innovation process, the learning that yields higher quality, lower cost products depends on the *organizational integration* of people with an array of functional capabilities and hierarchical responsibilities. Given the cumulative character of the innovation process, the ability of the firm to sustain the innovation process from the time at which investments in productive capabilities are made until the innovative products are sold depends on *financial commitment*. Taken together, strategic control, organizational integration, and financial commitment constitute *social conditions of innovative enterprise* (Lazonick 2010). In this paper, we analyze Apple's performance as a company from the time it was founded in 1976 to the present in terms of these three social conditions of innovative enterprise.

Innovation demands the strategic allocation of resources to the development and utilization of productive resources. Strategic control gives decision-makers the power to allocate the firm's resources to confront the technological, market, and competitive uncertainties that are inherent in the innovation process. For innovation to occur, those who occupy strategic decision-making positions must have both the abilities and incentives to allocate resources to innovative investment strategies. Their abilities to do so will depend on their knowledge of how the current innovative capabilities of the organization over which they exercise allocative control can be enhanced by strategic investments in new, typically complementary, capabilities. Their incentives to do so will depend on the alignment of their personal interests with the interests of the business organization over which they preside in attaining and sustaining its competitive advantage.

The implementation of an innovative strategy requires organizational integration: a set of relations that creates incentives for people with different hierarchical responsibilities and functional capabilities to apply their skills and efforts to strategic objectives. The need for organizational integration derives from the developmental complexity of the innovation process – that is, the need for organizational learning – combined with the imperative to secure high levels of utilization of innovative investments if the high fixed costs of these developmental investments are to be transformed into low unit costs. Modes of compensation in the forms of work satisfaction, promotion, remuneration, and benefits are important instruments for integrating individuals into the organization.

This collective learning, moreover, accumulates over time, thus necessitating financial commitment to keep the learning organization intact until it can generate financial returns. What is often called “patient” capital enables the capabilities that derive from

collective learning to accumulate over time, notwithstanding the inherent uncertainty that the innovation process entails.

The impact of the social conditions of innovative enterprise on Apple's economic performance cannot be understood as a linear trajectory from startup to success. It happens to be the case that over three decades ago, when Apple Computer had barely emerged from its startup phase, the company was already famous for much the same types of things as it was until recently: its visionary leader (even if not then CEO) Steve Jobs; its (for the time) sophisticated digital products aimed at the masses; and the four-year-old company that, on December 12, 1980, had raised the most money in an initial public offering since the Ford Motor Company, then 53 years old, had gone public in 1956 (Polsson 2013). In the interim, however, there were important changes in Apple's business model – the interaction of strategy, organization, and finance – that set the stage for understanding the company's phenomenal growth over the past decade. And, as we shall argue, since the death of Jobs, under his successor as CEO Timothy D. Cook, important changes in Apple's business model have occurred that suggest that Apple's innovative capability will be much diminished in the future.

This paper asks questions regarding the sources of innovative enterprise that can only be answered by analyzing the interaction of strategic control, organizational integration, and financial commitment in determining a firm's economic performance. These questions include the following:

- As a strategic decision-maker, how important was Steve Jobs to the success of Apple, both before September 1985 when he was ousted from the company he had founded and after December 1996 when he returned? How was strategic decision-making different during the 11 years when Jobs was absent from the company? And how is it different now under CEO Cook?
- What types of organizational capabilities enabled Apple to generate great products? What key technologies did Apple develop in the company, and what did it acquire from outside? What was the role of organizational integration in Apple's learning processes, and how, in the post-Jobs era, might this condition of innovative enterprise be breaking down?
- What, during different phases in its history, were the sources of finance that enabled Apple to grow? Given the public focus on Apple's IPO in its early years and on its stock-price performance more recently, what was the role of the stock market in financing the company's growth? What are the implications for Apple's future of its decision to dole out as much as \$100 billion to shareholders from the fourth quarter of 2012 (when the company paid its first dividend since the first quarter of 1996) through the first quarter of 2016?

Answers to these questions for a company that has been a long-run success story can contribute to a theory of innovative enterprise. This theory is in turn needed to comprehend how government policy might support or undermine innovative enterprise. In particular, it provides a foundation at the level of the business enterprise for assessing the contribution to corporate success of investments in technology made by the “entrepreneurial state” (see Mazzucato, 2013b). Armed with a theory of innovative enterprise, we can explore the conditions, going forward, under which Apple will remain a productive enterprise that invests for the future or a financial enterprise that lives off the past, and the implications for the relationship between who takes the risk in and who reaps the rewards from investments in productive capabilities (see Lazonick and Mazzucato, 2013). In the case of Apple, a theoretical understanding of its phenomenal success can also help shape the public debate on the implications for the economy of equity, stability, and growth of the ongoing resource-allocation decisions of a cash-rich company with a dominant market position whose executives now see “returning cash to shareholders” as the company’s major, and maybe even top, priority.

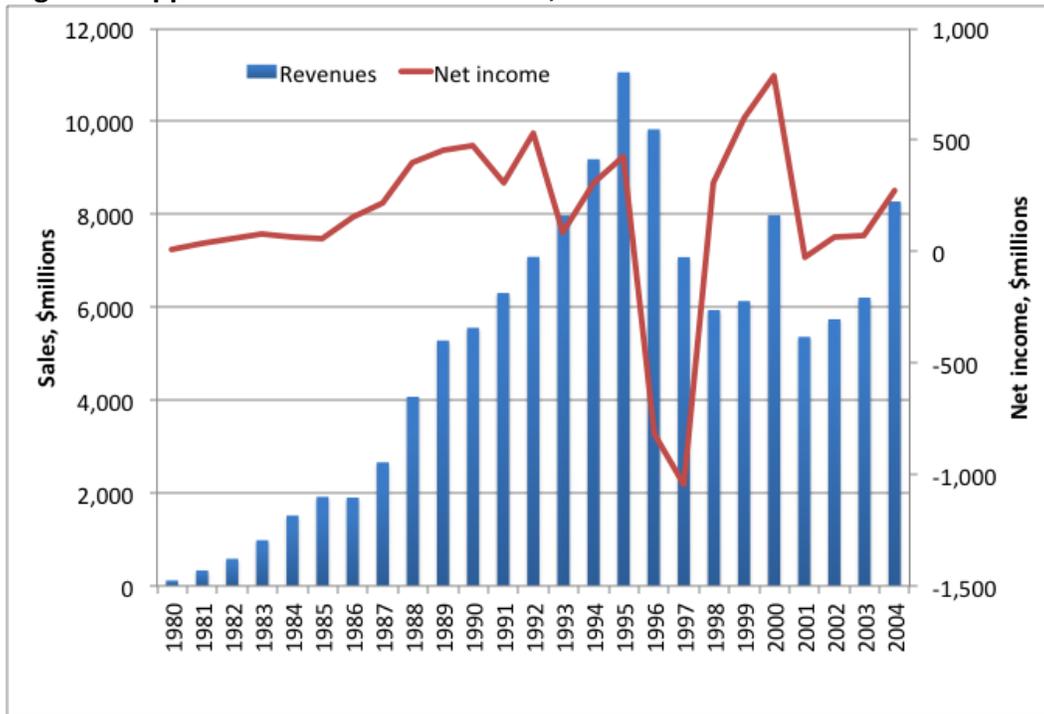
It was by no means preordained that, in the second decade of the 21<sup>st</sup> century, Apple would be at the center of attention. Indeed, it was not that long ago that many observers of the computer industry had written Apple off (Schlender and Martin, 1996). In October 1997, just after Steve Jobs had agreed to be the interim CEO of Apple, Michael Dell, founder, chairman, and CEO of Dell Computer, was asked what he would do if he were in Jobs’ shoes. “What would I do?” Dell responded. “I’d shut it down and give the money back to the shareholders” (Printing World, 1997).

Jobs did not, of course, take Dell’s advice. Four years later, however, Apple remained a niche player in the personal computer industry with 4.5 percent of the global market, approximately one-third of the market share of the industry leader, Dell. With the bursting of the Internet bubble in 2001, the personal computer industry as a whole was in a slump. At the time, personal computers, including the traditional PowerMacintosh and newer iMac lines, represented 82 percent of Apple’s total sales, with the remainder coming from peripherals and software.

Apple’s extraordinary growth since 2001 has come from a series of innovative products from the iPod to the iPhone and the iPad that, some three decades after the same company launched the microcomputer revolution, have made connected digital devices ubiquitous in our everyday lives. It is fair to say that Apple both set off and completed (for now at least) the process that brought the power of computers to the masses. Apple has gone further than any other company in integrating information and communication technologies for use in everyday life.

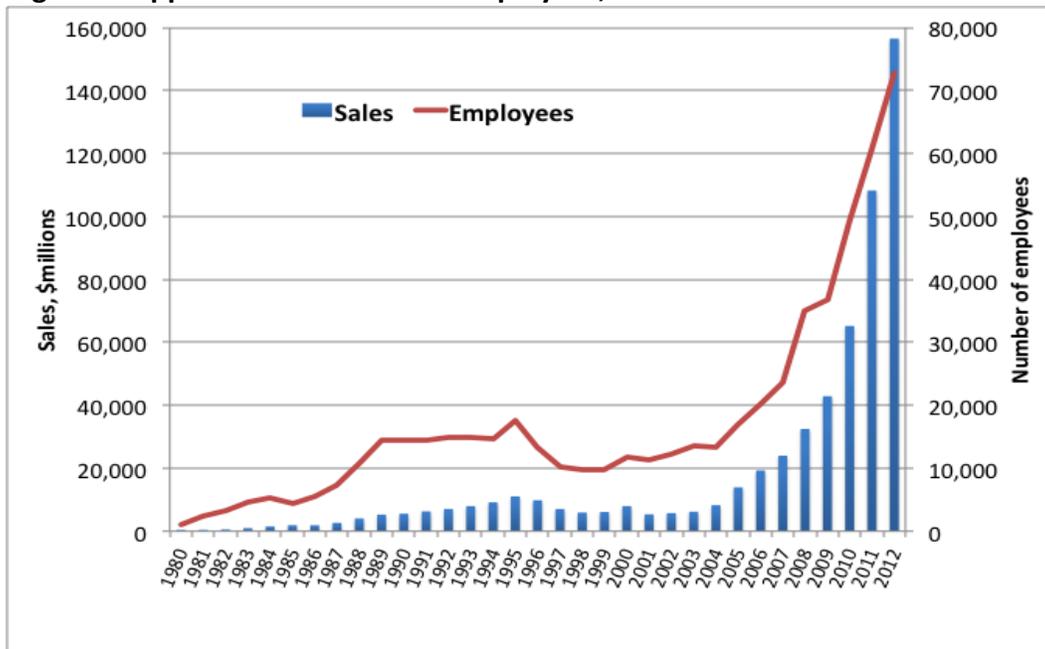
This feat has enabled Apple to become one of the richest companies in history. In fiscal 2012, Apple Inc. had revenues of \$156.5 billion and net income of \$41.7 billion. Sales in 2012 were 23 times greater in 2012 dollars than sales in 2001. Figure 1 shows Apple’s sales and net income from 1980 to 2004, when the success of iPod/iTunes was clear, but the company had not yet embarked on its stratospheric growth.<sup>3</sup> Figure 2 shows revenues and employment for Apple over its entire history as a public company to date. As stated previously, in 2005, Apple recorded its highest levels of sales and profits up to that point in its history. Between 2005 and 2012, however, Apple’s sales increased by 11 times and its profits by 31 times.

**Figure 1: Apple Inc. sales and net income, 1980-2004**



Source: Standard & Poor’s Compustat database, annual

<sup>3</sup> With \$8.2 billion in sales and \$276 million in profits in 2004, Apple’s sales were still less than the peak of \$11.1 billion in 1995, while profits were less than the \$786 million recorded in 2000. If the sales and profits data from 2005 through 2012 were to be included in Figure 1, the graphing of the earlier years would become unreadable, especially for net income.

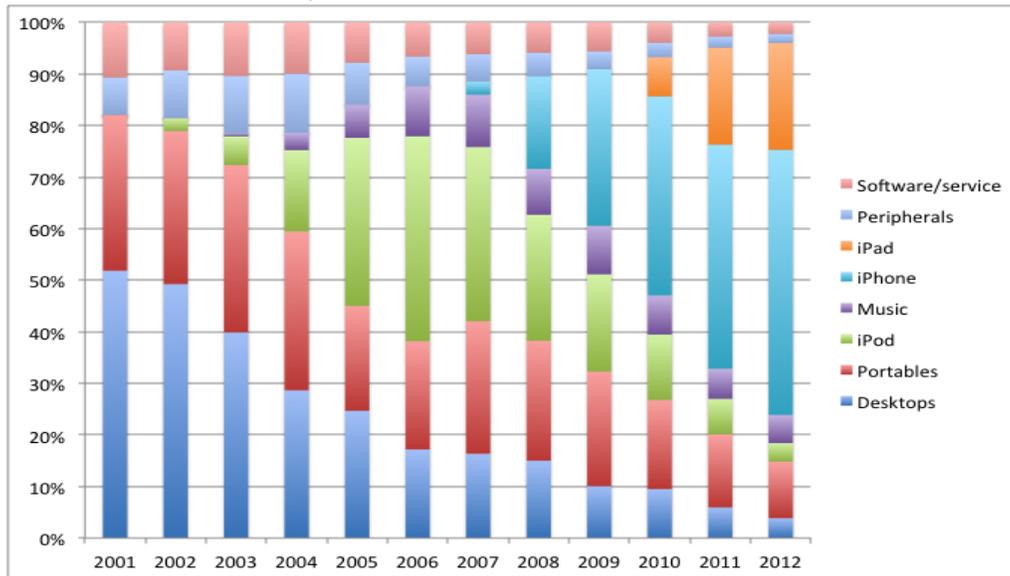
**Figure 2: Apple Inc. revenues and employees, 1980-2012**

Source: Standard & Poor's Compustat database, annual.

In 2001, Apple introduced the iPod music player along with a free music download application called iTunes. Apple also opened its first independent retail store the same year. Then, in May 2003, the iTunes app became the iTunes Store, with, initially, 200,000 songs that could be purchased and downloaded online for 99 cents each. From 2001 to 2006, Apple's sales grew from \$5.3 billion to \$19.3 billion. In 2006, iPod sales accounted for 40 percent of the total, and music sales represented another 10 percent (Figure 3). Computer sales climbed from \$4.4 billion in 2001 to \$7.4 billion in 2006, but they now represented only 38 percent of Apple's total sales. By 2006, Apple had opened 165 stores (147 in the United States) that generated \$3.4 billion in sales, accounting for over 17 percent of the company's total revenues.

Then, in 2007, Apple introduced the iPhone, which was sold to consumers not only by Apple but also by wireless service providers with Apple contracts. By 2012, iPhone sales represented over 52 percent of total sales. Computer revenues more than doubled from \$10.3 billion in 2007 to \$23.2 billion in 2012, but as a share of total sales declined from 42 percent to 15 percent. Music sales increased from \$2.5 billion in 2007 to \$8.5 billion in 2012, but they declined from over ten percent to less than six percent of the total. Only iPod sales declined in absolute terms over this period, from a peak of \$9.2 billion in 2008 to \$5.6 billion in 2012. Now iPhone users had the iPod functions on their smartphones. So too did iPad users, the tablet computer that Apple introduced in 2010. By 2012, iPads generated \$32.4 billion in sales, 21 percent of Apple's total. These iPad sales alone were almost five times Apple's total revenues (in 2012 dollars) in 2001.

**Figure 3: Relative importance of Apple's different products as a percentage of total sales, 2001-2012**



Source: Apple 10-K filings, 2001-2012

As a consequence of this phenomenal growth, Apple accumulated an enormous cache of liquid assets. At the end of fiscal 2010, Apple had \$41.7 billion in current assets and \$25.4 billion in long-term marketable securities. By the end of fiscal 2012, this war chest had grown to \$55.7 billion in current assets and \$92.1 billion in long-term marketable securities. In these two years, retained earnings increased from \$37.2 billion to \$101.3 billion.

In the fourth quarter of 2012 Apple paid out \$2.5 billion in dividends, the company's first dividend payout since 1996, just before Apple founder Steve Jobs returned to the company after an 11-year absence. The company also paid another \$2.5 billion in dividends in the first quarter of 2012 (ending December 29). In 2012, Apple's board authorized its executives to repurchase up to \$10 billion of the company's stock, beginning in fiscal 2013. In the first quarter of 2013, Apple did nearly \$2 billion in stock buybacks, approximately 10 percent less in nominal dollars than all of the buybacks that the company had previously made, with most of those repurchases having been done in the "Sculley era" between 1986 and 1993.

Notwithstanding the renewed attention to distributions to shareholders, however, the speculative fervor in Apple stock subsided; its stock price sank from a high of \$705 on September 21, 2012 to (as of this writing) as low as \$385 on April 19, 2013. On April 23 Apple announced that its board had authorized an increase in its program to "return capital to shareholders" to a total of \$100 billion by the end of calendar 2015. The \$60

billion in authorized buybacks that the \$100 billion includes is the largest single stock repurchase program in history (Apple Inc., 2013a).<sup>4</sup>

How then can we explain Apple's success? One might be tempted to argue that it was the work of one man of incredible vision, talent, and drive who happened to be in the right places at the right times. This "great man" theory of Apple's success seems all the more plausible not only because Steve Jobs was extraordinarily visionary, talented and driven but also because, in retrospect, the company's "lost decade" occurred during the time from September 1985 to December 1996 when Jobs and Apple had parted ways.

However, to reduce the Apple story to the Jobs story would be to ignore the particular concatenation of social conditions that have underpinned the company's innovative success. To summarize our main argument, in his position of strategic control, Steve Jobs led Apple as a professional manager, not an owner, who was driven by the desire to produce superior digital devices that would find widespread demand, even at premium prices, in mass markets. The internal learning process that resulted in Apple's epoch-making digital devices entailed a high degree of organizational integration of large numbers of people with a wide-range of functional specialties and hierarchical responsibilities. This organizational integration was fundamental to the development of the technologies that underpinned Apple's growth. For Jobs, profits were a vital source of financial commitment for innovative investment strategies, not an objective of the firm. Unlike John Sculley, Apple CEO from 1983 to 1993, Jobs had little if any interest in distributing earnings to public shareholders. Jobs installed what Lazonick and O'Sullivan (2000) have called a "retain-and-reinvest" allocation regime.

In the three sections that form the body of this paper, we analyze the evolution of, respectively, strategic control, organizational integration, and financial commitment as conditions for innovative enterprise that ultimately determined Apple's success. Building on this analysis, we conclude the paper with a discussion of how, now that the company has been phenomenally successful, Apple should allocate its resources to reward those economic actors, including taxpayers and workers, who have contributed to its innovative success while renewing investments in productive capabilities to ensure that the company can remain innovative in the future. Building on a substantial body of research on the financialization of the industrial corporation (Lazonick, 2013a and 2013b), we prognosticate on the adverse implications of Apple's recent commitment to

---

<sup>4</sup> Note that a stock repurchase *program* authorizes the company's top executives to do open-market purchases of the company's stock at their discretion and without announcing the actual buyback activity publicly. Under Rule 10b-18 of the Securities and Exchange Commission, the authorization of the company's board also provides its executives with a "safe harbor" from charges of manipulating the stock market through large-scale repurchases. According to this rule, on any one day, a company can repurchase up to 25 percent of the average trading volume of its stock over the previous four weeks without opening itself up to charges of manipulating the market. On July 22, 2013 the permissible value of daily repurchases for Apple Inc. under Rule 10b-18 was about \$1.17 billion (see Lazonick 2013b).

“return capital to shareholders” for the company’s capability to remain a leader in high-tech innovation in the years to come. During the first decade of the 21<sup>st</sup> century, Apple was an exception to the rule of the financialized corporation in the United States. Now, it seems, it is not.

## **2) Strategic control**

Born in 1955, Steve Jobs was only 21 when he co-founded Apple Computer, originally housed in a spare bedroom and garage of his parents’ home in Los Altos, California, in the heart of Silicon Valley. From the outset, Jobs was the strategic thinker, with Steve Wozniak, an electronics whiz four and a half years his senior, as his implementer. Together they founded Apple Computer on April 1, 1976, along with Ronald Wayne, a 41-year-old electrical engineer, who however quickly gave up his 10 percent share of the company.

The need for financing to build a better computer and scale production meant that within a year of the company’s launch, Jobs had to share strategic control with an angel investor, Mike Markkula, who provided the fledgling company with \$250,000 in equity and loans in return for a 26-percent stake (Isaacson, 2011: 77).<sup>5</sup> Formerly a marketing manager at Fairchild Semiconductor and Intel, Markkula made enough money from his stock options at Intel that he had “retired” at the age of 32 in 1974. He would end up remaining the most powerful person at Apple for the next two decades, until the second coming of Jobs.

Upon joining Apple in 1977, Markkula immediately brought in a professional manager, Michael Scott, himself only 32 years old, to be the company’s first CEO. Previously, Scott had been director of manufacturing at National Semiconductor. In 1981, after Scott had abruptly fired 40 people at Apple, he was ousted with Markkula taking over as CEO and Jobs becoming chairman. In 1983, in a highly competitive personal computer market in which IBM was rapidly increasing its market share (Table 1), Jobs and Markkula recruited John Sculley, age 44 and president of Pepsico, to take over as CEO with a view toward emphasizing the marketing of Apple’s computers. Initially, Sculley and Jobs viewed themselves as a team, integrating their expertise in markets and technology, but with the much more senior Sculley as young Jobs’ boss.

---

<sup>5</sup> Under the new agreement, which included the incorporation of Apple, Jobs, Wozniak, and Markkula each had a 26 percent stake in the company with the remaining 22 percent reserved as treasury shares to attract new investors and personnel.

**Table 1: Microcomputer revenues (\$ millions), 1982-1985 of the top 10 producers in 1985**

<b><i>Company</i></b>	<b><u>1982</u></b>	<b><u>1983</u></b>	<b><u>1984</u></b>	<b><u>1985</u></b>
<b>IBM</b>	500	2,600	5,500	5,500
<b>Apple Computer</b>	664	1,085	1,747	1,603
<b>Olivetti</b>	--	252	497	885
<b>Tandy</b>	466	598	574	797
<b>Sperry Rand</b>	--	386	503	743
<b>Commodore International</b>	368	927	1,000	600
<b>Compaq Computer</b>	--	111	329	504
<b>Hewlett-Packard</b>	258	399	500	400
<b>Convergent Technologies</b>	--	163	362	395
<b>Zenith Electronics</b>	--	--	249	352

Source: Chandler, 2001: 118.

Sculley's claim-to-fame at Pepsico had been "The Pepsi Challenge" in which consumers blind-tasted Pepsi Cola and Coca Cola to see which soft drink they preferred. Scully, who by his own later admission knew nothing about computers when he came to Apple (Kahney, 2010), viewed the personal computer as a commodity in which marketing would be the main source of competitive advantage. In sharp contrast, Jobs, who in addition to his role as chairman of Apple's board also headed the team that was developing the soon-to-be launched Macintosh computer, viewed the personal computer as an evolving technology in which the key to competitive advantage lay in continuous innovation based on an understanding of both the internal capabilities of the business organization and the opportunities made possible by technological developments external to the firm.

The Macintosh computer, with the graphical user interface (GUI) introduced with Apple's much more expensive Lisa computer in 1983, first shipped in January 1984 and had its initial success in the education market. In the following year, Apple sought to add to the Macintosh's applications to enable it to compete in the IBM-dominated office market and lower its price to expand market share in the home market. In 1984 and early 1985, as Apple expanded its sales but as IBM became even more dominant in the overall PC market, Sculley and Jobs found themselves at loggerheads over the direction of the company.

In May 1985, Sculley revoked Jobs' operating control over the Macintosh division. From his position as board chairman, Jobs attempted to reassert a degree of control over the company, but Markkula, who was board vice-chairman, and the rest of the Apple directors backed Sculley. Four months later, Jobs left Apple, selling all his shares in the company save one. With a number of people who joined him from Apple, Jobs then used \$12 million of those funds to launch NeXT to develop a state-of-the-art

workstation. NeXT received equity investments of \$20 million from information-systems magnate H. Ross Perot in 1988 and \$100 million from the Japanese company Canon in 1989. At NeXT, Jobs led the development of a technologically sophisticated computer with interactive capabilities. After having sold only 50,000 machines in total, however, NeXT exited the hardware business in 1993 to focus on the development of its software, including an “object-oriented” operating system that could cope with the multitasking demands of a computer connected to the Internet (Pollack, 1993).

Meanwhile, back at Apple in 1985, Jobs’ former position as head of the Macintosh division had been awarded to Jean-Louis Gassée, previously head of Apple France. Gassée clashed with Sculley when the CEO sought to shift the Macintosh to an open-systems platform in the manner of IBM and its clones and develop a low-cost alternative to the Macintosh. On both issues, Gassée’s point of view won out for the time being, ensuring that by the end of the 1980s the Macintosh would continue to be a premium microcomputer that could continue to increase Apple’s revenues in the face of the growing dominance of the IBM PC and its clones.

In 1990, however, Sculley forced Gassée out of Apple. Taking a page from Jobs’ playbook, Gassée formed Be Inc. to create a new high-end computer, integrating hardware and software. Similar to NeXT, Be Inc. developed proprietary hardware, but its potentially valuable intellectual property was its operating system known as BeOS (Linzmayr, 1999).

With the departure of Gassée, Apple’s R&D organization now reported directly to Sculley. For the first time, he exercised complete control over the company’s technological development. Sculley made Michael Spindler, a German who had joined Apple in Europe in 1980, president and chief operating officer, while Sculley became chief technology officer and CEO. In 1991, Apple entered into an agreement with IBM and Motorola – known as AIM – to develop a RISC microprocessor for a variant of the Macintosh that Apple would call the PowerPC. Sculley also championed a project called Newton, begun under Gassée in 1987, to develop a personal digital assistant (PDA) with handwriting recognition (Hormby, 2010). In May 1993, Apple announced that it would collaborate with open systems vendors in an effort to boost the sales of Apple’s computers.

In the first quarter of 1993, IBM sought out a new CEO, and Sculley’s name was prominently mentioned. Scully also thought that a merger between Apple and IBM could create a powerful alternative to the now-dominant “Wintel” architecture engendered by IBM’s entry into the microcomputer industry at the beginning of the 1980s. In the event, IBM’s board selected Louis V. Gerstner as CEO in April 1993. Gerstner’s primary role at IBM was to shift the company out of hardware into software and services. One result of this strategic orientation was that IBM subsequently failed to support the on-going development of the PowerPC as had been envisioned in the

AIM alliance.<sup>6</sup> Meanwhile, the Newton PDA, which cost approximately \$100 million to develop, was produced by Apple from 1992 through 1998 but is now considered to be one of Apple's biggest failures (Shah, 2007).

In June 1993, Scully resigned as Apple CEO, remaining as chairman for another five months. In fiscal 1993, Apple's revenues rose to \$8.0 billion, a 13 percent increase from the previous year. In the third quarter of that year, however, the company lost \$184 million and ended the year with an annual profit of only \$87 million. Moreover, Sculley was failing to deliver "shareholder value". Apple's 1993 business plan had, for the first time, included "maximizing shareholder value" as an important managerial objective, with executive bonuses (and not just stock options) being tied to stock-price performance (Yoffie, 1994). In June 1993, Apple's stock price had fallen 34 percent from six months earlier and would fall another 41 percent over the following three months. Markkula, still chairman, pushed out Sculley, replacing him with Spindler as CEO.

Over the next two years, Apple's revenues continued to rise, reaching \$11.1 billion in 1995 – a figure that even in nominal dollars would not be surpassed until 2005 – while profitability was restored. Employment stood at 17,615 people at the end of 1995, up from 14,938 two years earlier. In June 1995, Apple's stock price was twice its level in September 1993. Virtually all of Apple's revenues came from Macintosh products.

Yet Apple's share of the global PC market fell from 9.5 percent in 1993 to 8.4 percent in 1994 and 7.8 percent in 1995, at which point Compaq was first overall with a 10.0 percent share and IBM was second with an 8.0 percent share (Reuters News, 1996). Apple's net income for all of 1995 was \$424 million but was only \$60 million in the fourth quarter, down from \$115 million a year earlier. In the first quarter of 1996, Apple lost \$69 million, and it announced layoffs of 1,300 people, or eight percent of its labor force, in January 1996.

Then, in February, Spindler lost his job, as the board brought in Gilbert Amelio, head of National Semiconductor, to be Apple's new CEO. Amelio also became chairman, with Markkula remaining on the board as vice-chairman. However, Apple continued to decline, with revenues dropping from \$11.1 billion in 1995 to \$7.1 billion in 1997, and losses over the two years totaling \$1.9 billion.

The main cause of this reversal was Microsoft's Windows 95, released in August 1995, which was then bundled with Internet Explorer. Until the advent of Windows 95, the technological superiority of the Macintosh, with its graphical user interface and desktop publishing features, had enabled Apple to retain a large market niche with premium pricing. After August 1995, that advantage was gone, and even before the release of Windows 95, Apple had been cutting prices to maintain market share.

---

<sup>6</sup> The background to AIM was the collaboration between Apple and IBM to develop an object-oriented operating system, begun in 1989, code-named "Pink," which was spun off as Taligent (Pollack, 1991).

Windows 95 did not catch Apple by surprise. Since early 1994, Apple had been developing its own operating system for the Internet age (to handle “memory protection” and “pre-emptive multitasking”), code-named Copland, with an initial release date planned for 1995. However Apple was repeatedly forced to push the launch date forward until, finally, in August 1996, Copland was canceled. It stands as perhaps the company’s greatest failure.

Jean-Louis Gassée stepped into the void with an offer to sell his company Be, with its BeOS software, to Apple. Believing that Apple had no alternative but to acquire Be, however, Gassée overplayed his hand in negotiations in November and December 1996 (Linzmayr, 1999). Meanwhile, out of public view, NeXT executives were in discussions with Ellen Hancock, Apple’s chief technology officer, and in December, Apple purchased Steve Jobs’ company for \$427 million, over twice its highest offer to Be.

For Amelio, getting Jobs to return to Apple in some capacity was apparently part of the attraction of acquiring NeXT. Jobs wanted a seat on the board, but Amelio, who was board chairman and CEO, refused. Jobs agreed to take a position as advisor to the chairman. At the time Jobs was the CEO of Pixar, the highly successful animation company in which he had bought a large stake in 1986.

In his advisory role at Apple, however, Jobs was exceedingly active, aided by the fact that his top people at NeXT were now working for Apple and were critical to delivering the operating system that had been the purpose of the acquisition. According to his biographer Walter Isaacson (2011: 308), “Jobs immediately put people he trusted into the top ranks of Apple. ‘I wanted to make sure the really good people who came in from NeXT didn’t get knifed in the back by the less competent people who were in senior jobs at Apple,’ he recalled.” Jobs had Hancock, Apple’s CTO, replaced by Avie Tevanian and Jon Rubinstein, two of his top people from NeXT. On February 25, 1997, veteran reporter Louise Kehoe wrote in the *Financial Times*:

Mr Jobs has become the power behind the throne, according to several current and former Apple employees. He is said to be directing decisions on which parts of Apple’s operations should be cut. Mr Jobs has urged a number of former Apple colleagues to return to the company, hinting strongly that he plans to take charge, they said. According to one of Mr Jobs’ confidantes, he has decided that Mr Amelio and his appointees are unlikely to succeed in reviving Apple, and he is intent upon replacing them to ensure the survival of ‘his company’ (Kehoe, 1997).

In July, Apple’s board forced Amelio to resign. Jobs had already been asked if he wanted to become the company’s CEO, but he demurred. The board then began a search for a new CEO. In September it was announced that Jobs had agreed to be interim CEO, a title that, as it turned out, he retained until 2000. However, by 1998, the composition of Apple’s board had already changed, with only Amelio’s most recent

appointees, Edward Woolard (a major supporter of Jobs) and Gareth Chang remaining (Lillington, 1999). Among those no longer involved with Apple was early investor Mike Markkula, who had been vice-chairman in 1997. The new board was handpicked by Jobs. No one was designated as board chairman; as a director, Jobs de facto occupied that role. Steve Jobs was now in complete control of the company that he had founded in 1976 and which he had left in 1985.

In a February 1996 article in *Fortune* that appeared just before Amelio replaced Spindler as CEO, Jobs was asked what he thought about the plight of the troubled company. Jobs' response: "To me it's simple. If I were running Apple, I would milk the Macintosh for all it's worth – and get busy on the next great thing. The PC wars are over and done. Microsoft won a long time ago" (Schlender and Martin, 1996). Firmly in a position of strategic control, in fiscal 1998, Jobs set to work on implementing his vision for Apple's future.

### **3) Organizational integration**

In a March 2009 television interview, Steve Jobs said: "Someone long ago told me: 'Manage the top line, which is your strategy and your people and your products, and the bottom line will follow.'" He then went on to say: "My model for business is the Beatles. They were four guys that kept each other's negative tendencies in check; they balanced each other....And the total was greater than the sum of the parts. Great things in business are never done by one person, they are done by a team of people" (Isaacson, 2011).

Yet, by all accounts, Jobs had a unique way of achieving harmony. From the early days of Apple, Jobs' articulation of his strategic vision for the company was known as his "reality-distortion field". As Andy Hertzfeld (1981), the chief programmer in the development of the Macintosh, put it:

The reality distortion field was a confounding melange of a charismatic rhetorical style, an indomitable will, and an eagerness to bend any fact to fit the purpose at hand. If one line of argument failed to persuade, he would deftly switch to another. Sometimes, [Jobs] would throw you off balance by suddenly adopting your position as his own, without acknowledging that he ever thought differently. Amazingly, the reality distortion field seemed to be effective even if you were acutely aware of it...

A strategic vision, however articulated, does not create innovative products. Critical to the innovation process in any enterprise is the integration of strategy and learning (O'Sullivan, 1998). The learning process that is the essence of innovation is collective and cumulative; it cannot be done alone or all at once (Best, 1990:125). Innovation requires those who exercise strategic control to not only attract individuals to perform specialized functions in the project's division of labor but also to motivate them to integrate those individual capabilities into an organizational learning process. By the

same token, if there is segmentation between strategy and learning, the innovative capability of the organization of a previously successful company can break down.

Jobs had a talent for aligning himself with talent that could turn an imagined product into reality. It was Wozniak's wizardry that created, out of purchased components, circuit board architectures that were marketed as the Apple I and Apple II and were superior to the competition. The person who set the Macintosh project in motion in 1979 was Jef Raskin, a 36-year-old computer scientist who joined Apple as its 33<sup>rd</sup> employee in January 1978. Back in 1967, Raskin had written a PhD dissertation on the potential for the graphical user interface as alternative to text in the operating systems of computers (Isaacson, 2011: 108). His employment at Apple offered him the opportunity of implementing that idea. According to Isaacson, "Raskin's goal was to make an inexpensive 'computer for the masses' that would be like an appliance – a self-contained unit with computer, keyboard, monitor, and software all together – and have a graphical interface" (Isaacson, 2011: 94).

During the 1970s, Xerox PARC, the Silicon Valley research lab of the photocopying giant, had developed these technologies (Hiltzik, 1999). It was located in Palo Alto just 11 miles from Apple's headquarters in Cupertino. Raskin and a former student, Bill Atkinson, who was also integral to the Macintosh team, convinced Jobs that he had to see PARC's technologies. In the summer of 1979, Jobs made a deal with Xerox to let its venture-capital operation purchase \$1 million in Apple stock in return for a three-day visit to PARC by Apple's team to view its computer innovations. As Jobs put it: "I will let you invest a million dollars in Apple if you will open the kimono at PARC" (Isaacson, 2011: 94).

The visits to PARC, which occurred in December 1979, illustrate the importance of the Macintosh development team to Jobs. Initially, the PARC scientist who was providing the briefings restricted the team to viewing the lab's more mundane technologies. However, having been briefed by his own team, Jobs knew that PARC had more to reveal, including the GUI, and he demanded to see it. Larry Tesler, the Xerox scientist who was most cooperative in showing the Apple team PARC's GUI and the other more interesting technologies, left the lab the following year to join Apple, where he remained until 1997. (Isaacson, 2011: 95-7).

By all accounts, the Macintosh division of Apple was a tightly integrated team working under Jobs' leadership by 1981. When it was released in 1984, the Macintosh was underpowered and short of software applications. When control over the division was taken away from Jobs in 1985, precipitating his departure from Apple, Macintosh development was handed over, as we have seen, to Jean Louis Gassée, who had a rapport with the project's engineers, and the product offering was improved over the ensuing years.

If, however, organizational integration prevailed in this critical division, by the late 1980s it was breaking down in Apple as a whole (Gibbs and Beer, 1991). Sculley and

Apple's other top executives were among the most highly remunerated in Silicon Valley, while the rank-and-file technical employees faced considerable uncertainty. For example, while (as discussed below) Apple's technical personnel had access to stock options and other perks, the company lacked a retirement plan – not even a 401(k) plan – during the 1980s. In 1990, Apple's head of human resources reportedly said, "someone who worries about a retirement plan probably isn't an Apple type of person" (Zachary, 1990). In 1985, during a slump in the microcomputer industry, Sculley had cut 1,200 employees, nearly 20 percent of Apple's workforce, although most of those who lost jobs were temporary employees. In 1990, Apple cut 400 workers, and another 1,500 in 1991, approximately 10 percent of its workforce, primarily to make up for lower profit margins as it reduced the prices of its Macintosh computers to keep them competitive (Myers, 1991a). During the following years, under Sculley, Spindler, and Amelio, cost-cutting, rather than organizational learning, was the dominant theme at Apple.

In 1999, in an article entitled "Putting People First for Organizational Success," organization theorists Jeffrey Pfeffer and John F. Veiga wrote:

Apple was a company largely built on a unique culture. The Macintosh design team worked in a separate building with a pirate flag flying over it. The company built a cult-like commitment among its employees. People were recruited to Apple with the idea that they would be helping to change the world. Apple was more than a company: it was a cause. Its strategy of being an innovator in designing user-friendly personal computers that would make people more productive required a highly talented, creative, and innovative work force. When it took actions that resulted in the loss of that work force, its ability to implement its business strategy and to regain market leadership was irreparably harmed (Pfeffer and Veiga, 1999: 38).

Meanwhile, by the beginning of the 1990s, there was also a great deal of discord even within the top ranks of Apple. Data that we have collected on the exits of top Apple executives show constant departures throughout the Scully-Spindler-Amelio era, culminating in a substantial housecleaning in 1997 when Jobs returned to the company. Then, from 1997 to 2004, for the first time, there was remarkable stability in Apple's leadership.

It will take additional research into the breakdown in organizational learning at Apple during the early and mid-1990s to determine its role in the failure of key projects, especially the ill-fated Copland OS that, as we have seen, paved the way for Jobs' return to Apple. In analyzing the evolution of a business model, the most difficult areas to research are changes in employee morale and its influence on productive performance. The impacts of different modes of remuneration on attracting, retaining, motivating, and rewarding employees within the organization must be included in any analysis of these questions (Glimstedt et al., 2006).

Within a Silicon Valley company such as Apple, in addition to one's salary, the most important form of remuneration was employee stock options (Lazonick, 2009a: chs. 2 and 6). With the microelectronics revolution of the 1980s, a New Economy company such as Apple found itself in competition for professional, technical, and administrative labor with Old Economy ICT companies such as Hewlett-Packard, IBM, Motorola, Texas Instruments, and Xerox that, in the 1980s, still offered employees the realistic prospect of a career with one company with a defined-benefit pension at the end. As young firms facing a highly uncertain future, New Economy companies could not attract labor away from Old Economy companies by promises of career employment. Instead the New Economy startups used the inducement of employee stock options to attract and retain employees—very high proportions of whom were college-educated. As the successful New Economy companies grew large, most, if not all, employees were partially compensated with stock options.

To ensure that stock options would perform not only an attraction but also a retention function, the practice of making option grants annually evolved among New Economy firms, with the vesting period for any annual block of option grants being 25 percent of the grants at the end of each of the first four years after the grant date. Once the options vest, they can typically be exercised for a period of ten years from the grant date, so long as one remains with the company. Without creating the Old Economy expectation among employees of lifelong careers with the company, the perpetual pipeline of unvested options functions as a tangible retention mechanism. Indeed, for most employees, the amount of options that an individual can expect to receive is tied to his or her position in the firm's hierarchical and functional division of labor, such that the retention function of stock options is integrally related to the employee's career progress within the particular company (Lazonick, 2009a: 39-7, 115-147).

Apple adopted its first broad-based employee stock option plan in 1981, another in 1990, and a third in 1997 that also integrated NeXT's employee stock option plan into Apple's operations (Apple 10-K 1994: 37; Apple 10-K 1997: 49). The broad-based employee stock option plan that was in place in 2012 was adopted in 2003 (Apple 10-K 2012: 65). As is the case with most companies, Apple does not provide information on the proportion of its employees who are awarded stock options, and, other than the CEO and the other four highest paid executives who are named in annual proxy statements, we have no information on the distribution of stock options among its employees by function, hierarchical position, or geographical location.

Since the mid-1930s, U.S. companies have been required to report the levels and components of the pay of their CEO and four other highest paid executives ("top5"). Gains from exercising stock options are typically the largest component of total executive pay and the main driver of the explosion in executive pay since the early 1980s (Lazonick, 2009b). From 1994, U.S. companies have been required to report information on their stock option plans more generally, including the number of stock options exercised in a given year and the weighted average exercise price. From these

data, we can estimate the average gains from exercising stock options in a company in a given year across all employees in that year, excluding the top5.

These estimates for Apple are presented in Table 2. When a company's stock price increases substantially, employee stock options can provide significant additional remuneration to the holders of these options. As observed in Table 2, on average, across over 11,700 employees, these gains from exercising stock options first became large in 1999 and, even more so, in 2000, as virtually all companies, and hence all employees who held stock options, benefited from the stock market boom.

**Table 2: Apple Inc. gains from exercising stock options, 1994-2012, top 5 executives and average gains of all other employees**

	Average gains top5* \$	Average gains, all other employees \$	Ratio top5/average employee	Average number of employees during year
1994	0	351	0	14,762
1995	612,917	814	753	16,099
1996	0	201	0	15,502
1997	173,839	465	374	11,782
1998	1,288,130	1,639	786	9,915
1999	2,927,808	8,959	327	9,695
2000	9,477,088	22,409	423	10,727
2001	0	1,591	0	11,576
2002	4,469,469	2,452	1,823	11,833
2003	0	556	0	13,491
2004	9,983,796	12,676	788	14,108
2005	15,319,924	92,985	165	16,289
2006	16,191,910	67,706	239	19,689
2007	11,441,033	65,506	175	26,795
2008	5,775,828	67,580	85	33,145
2009	3,626,893	20,220	179	40,445
2010	0	50,466	0	55,495
2011	0	49,834	0	53,495
2012	3,322,119	35,067	95	66,595

\* Note that these data do not represent all of the stock-based pay of top executives. For example Tim Cook, Apple CEO since 2011 received restricted stock awards valued at \$52 million in 2010 and \$376 million in 2011, but had no gains from exercising stock options in these years.

Source: Apple proxy statements and 10-K filings, 1994-2012

These gains at Apple, however, must be placed in comparative perspective. At Cisco Systems, also in Silicon Valley, and the company with the highest market capitalization in the world in March 2000, the average gains from exercising stock options were approximately \$193,000 across 18,000 employees in 1999 and \$291,000 across 27,500

employees in 2000, magnitudes larger than at Apple. At Dell Computer, based near Austin, Texas, these gains were \$127,000 across 20,200 employees in 1999 and \$85,000 across 20,500 employees in 2000. The most extreme case was at Microsoft, headquartered in Seattle, Washington, where the average gains from exercising stock options were \$370,000 across 29,200 employees in 1999, and \$449,000 across 35,200 employees in 2000 (Lazonick, 2009a: ch. 2).

Note that we do not know the distribution of these options across employees at any of these companies. As New Economy companies such as these grew during the 1980s and 1990s, virtually all professional, technical, and administrative employees received stock options based on years with the company and, in some cases, functional position (that is, for specializations that were in high demand). When the average gains from stock options reach the proportions reported above, large numbers of key personnel going deep into the organization can become extremely rich. It is said, quite plausibly, that there were 10,000 stock-option millionaires at Microsoft in 2000 (Bick, 2005).

Beginning in 2003, Microsoft ceased using stock options as a mode of remuneration. When the gains from exercising stock options become too great, this mode of compensation can fail as a mechanism for integrating people into a learning organization. Key technical and managerial employees, newly enriched far beyond a level that would be possible on the basis of normal salaries, may decide to leave the company, often to “retire” – in the manner of Mike Markkula when he left Intel back in 1974. Such exits by key personnel whom the company would want to retain are the antithesis of organizational integration, and hence are destructive to organizational learning.

As shown in Table 2, the average gains from exercising stock options at Apple since 2005 have been persistently high, even if they have not reached the levels of Microsoft, Dell, and Cisco during the Internet boom. We can assume that Apple awards some stock options to all professional, technical, and administrative personnel employed in the United States and that a significant proportion of them have accumulated substantial wealth. Thus far we have no evidence of a major exodus from Apple. For most key Apple employees, the pull of remaining with a winner has likely outweighed the exit option. However, over the past year, under Cook, Apple’s new (and himself extremely wealthy) CEO, Apple has demonstrated signs of concern regarding outwardly mobile employees by instituting new retention mechanisms such as “Blue Sky,” which allows engineers to work on their own favorite projects on company time (Leading Company, 2012), as well as, unusually, a dividend on unvested restricted stock units that have been awarded to (typically higher level) employees (Gupta, 2012). Since 2009, moreover, Apple has in effect ceased awarding stock options to its employees, its top executives recognizing that with its soaring stock price too many employees would simply get too rich to retain (Apple 10-K 2001-2012).<sup>7</sup>

---

<sup>7</sup> Stock-option awards averaged 10.9 million from 2005 through 2008, but dropped to 234,000 in 2009, 34,000 in 2010, 1,000 in 2011, and none in 2012.

Typically, production workers do not receive stock options. In any case, as is typical of New Economy companies, since the 1980s Apple has outsourced most of its manufacturing, and hence the company does not employ many production workers (Business Times Singapore, 1989). Apple contracts out much of its manufacturing to Foxconn, a division of the Taiwanese company Hon Hai Precision Industry that employs 1.3 million people worldwide and does most of its work for Apple in its huge factory complex in Shenzhen, China.

As shown in Table 3, most of the expansion of employment at Apple over the past decade has been at Apple's retail stores. The growth of Apple stores has created a distinct segmentation between a relatively small, but still highly significant, segment of professional technical, and administrative employees and a much larger group of young store personnel who receive relatively low pay and meager prospects of career advancement (Lazonick, 2011; Segal, 2012).

**Table 3: Apple Inc. retail stores and retail employees, 2001-2012**

	US retail stores	International retail stores	Retail employment	Per store	US retail employment*	Total employment	Retail employment as % of total	Increase in retail as % of total increase
2001	8	0				9,603		
2002	40	0	807	20	807	10,211	8	
2003	65	0	1,300	20	1,300	10,912	12	70.3
2004	84	2	2,100	24	2,051	11,695	18	102.2
2005	116	8	3,673	30	3,436	14,800	25	50.7
2006	147	18	5,787	35	5,156	17,787	33	70.8
2007	174	23	7,900	40	6,978	21,600	37	55.4
2008	205	42	15,900	64	13,196	32,000	50	76.9
2009	217	56	16,500	60	13,115	34,300	48	26.1
2010	233	84	26,500	84	19,478	46,600	57	81.3
2011	245	112	36,000	101	24,706	63,300	57	56.9
2012	250	140	42,400	109	27,179	72,800	58	67.4

\* estimate

Source: Apple 10-K filings, 2001-2012

#### 4) Financial commitment

Innovation is a collective and cumulative process. Strategy sets the innovative learning process in motion, and organization gets the innovative learning done. Finance sustains the innovation process from the time when investments in productive capabilities are made until the time when, through the development and utilization of those productive capabilities, the innovation process can generate returns. The amount of finance required depends on not only the size but also the duration of these investments in productive capabilities, which in turn depend on the types of

technologies that must be transformed and the markets that must be accessed to generate product revenues that are in excess of the costs of production and distribution.

The financing needs of a firm evolve over time. The financial requirements of a startup may be modest. If, however, the business model shows signs of success, scaling the enterprise typically requires large infusions of cash to enable it to cross what has come to be called “the valley of death”. If the firm can cross this innovation chasm with positive cash flow, it will then be in a position to use internal financial resources to sustain, in whole or in part, its further growth.

Apple Computer achieved positive cash flow in its early years and did not experience financial trouble until the beginning of fiscal 1994. Over the next three years, however, the financial condition of the company became fragile, threatening its ability to survive as an independent enterprise. Its financial position improved in 1998, despite a 16 percent drop in revenues from the previous year, due to a drastic reduction in its labor force – 1998 employment was only 55 percent of its level in 1995 – with the restructuring charges occurring mainly in 1996 and 1997.

In 1999 and 2000, Apple’s revenues and profits increased sharply, in part because of the introduction of the iMac and in part because of the Internet boom. In 2001, however, revenues fell by 33 percent from 2000, and the company went from profits of \$786 million to a loss of \$25 million. The labor force, however, was only cut by 2.5 percent. Under Jobs as CEO, it would be innovation, not downsizing, that would turn the company around. After 2001, iPod and iTunes sales began to help the bottom line, and by 2005, the company was making its highly profitable run.

Over the 37 years of the company’s existence, there have been changes in the sources of financial commitment that have supported the innovation process. To some extent, these sources of financial commitment reflect different stages in the growth of the firm from a new venture to a going concern. However, to some extent they also reflect resource-allocation decisions by executives who exercise strategic control, and success or failure in implementing the innovative strategy at the level of the learning organization.

As a startup, the financial commitment required to bring the company to the point at which it had a revenue-generating product was modest, in part because of the rent-free use of Jobs’ family home and garage and in part because the hardware required for the production of the Apple I computer, which had a keyboard but not a case or a display, entailed the purchase of easily accessible and relatively inexpensive components. In July 1976, Apple Computer, consisting of Jobs and Wozniak, demonstrated the Apple I at a meeting of the Homebrew Computer Club (Freiberger and Swaine, 2000: 265). After the meeting, Paul Terrell of the Byte Shop agreed to buy 50 Apple Is for approximately \$500 each, about twice the cost of the components. The co-founders of Apple decided to produce 100 computer boards with the prospect of

selling the other fifty to members of the Homebrew Computer Club. Apple financed the cost of the components for the Byte Shop order by obtaining 30-day trade credit from an electronics supplier on the strength of Terrell's pre-order. The company also obtained a \$5,000 loan at a high interest rate from one of Jobs' high-school friends, Allen Baum, and his father (see Moritz' 2010: 158). Wozniak sold an HP calculator and Jobs a Volkswagen bus for a combined total of \$1,300 that represented their contribution to the company's startup capital (Isaacson, 2011: 62-3; Moritz, 2010: 145). Less than two weeks after the company was founded, Jobs and Wozniak needed to use \$800 of their money to buy out Wayne's 10 percent share when he decided to leave the firm, with another \$1,500 owed to him (Isaacson, 2011: 65).

In addition to generating a rapid (but hard-earned) cash surplus, the production and sale of the Apple I enabled Jobs and Wozniak to gain the attention of Markkula. The two Steves had already developed a prototype of the Apple II, which integrated a keyboard into a smart-looking plastic case. According to Jobs, the upfront cost of tooling for the plastic case would be \$100,000, with the total fixed costs of putting the Apple II into production being approximately \$200,000 (Isaacson, 2011: 75). In January 1977, Markkula's \$250,000 capital infusion made it possible to produce the Apple II, with shipments beginning in June 1977 (Isaacson, 2011: 92). For fiscal year 1977 (ending September 30), the company had net revenues of \$710,380 and a net profit of \$48,882 (Apple Computer, 1977).

In November 1977, the *Washington Post* ran the story, "get ready for friendly home computers," which described Jobs' demonstration of "his firm's \$1,300 Apple II system, which, used in conjunction with an ordinary tape recorder and television, can be programmed to do everything from determining an individual's biorhythmic chart to balancing his checkbook." Questioned about the extent of the market for a \$1,300 gadget to balance checkbooks, Jobs responded: "People are buying them not to do something practical, but to familiarize themselves with the computer. People are learning about computers" (Cook, 1977).

Among those who were interested in learning about personal computers were some of the nation's leading venture capitalists. In January 1978, Apple received its first round of venture finance totaling \$517,500, of which \$288,00 came from Venrock, the venture capital firm of the Rockefeller family, based on the East Coast; \$150,000 from Sequoia Capital, launched in Silicon Valley in 1972 by Donald Valentine, who had been head of marketing at Fairchild Semiconductor and who in 1987 would back a three-year-old Silicon Valley company named Cisco Systems; and Arthur Rock, who had been centrally involved in establishing Fairchild Semiconductor in 1957 and had taken the lead in venture financing Intel in 1968. At that point Apple was valued at \$3 million.

In the summer of 1978, Continental Illinois Bank, a licensed Small Business Investment Corporation (SBIC) that benefited from guaranteed US government loans, invested

\$500,000 in Apple for a 5.5 percent stake.<sup>8</sup> Venrock also made an additional investment that increased its total capital contribution to nearly \$1 million, although Valentine declined to invest further. In October 1978, Henry Singleton, an electrical engineer who was the co-founder and chairman of Teledyne, for which Arthur Rock had provided venture financing in 1960, invested \$100,000, and was named to Apple's board (Moritz, 2010: 279).

In its second full year, ending September 30, 1978, Apple had \$7.8 million in revenues and \$793,497 in profits, 11 and 16 times, respectively, its performance during its first full year (Polsson, 2013). In the fall of 1978, the Visicalc spreadsheet program was adapted to the Apple II, providing the computer with its first "killer app" (Grad, 2007). In the summer of 1979, in a mezzanine financing, Apple raised \$7,273,801, from 16 investors, including Brentwood Capital Corporation and LF Rothschild, Unterberg, and Towbin (Moritz, 2010: 227-228). As we have already seen, Xerox's VC division secured the privilege of investing \$1 million in Apple in exchange for giving the startup a look at the technologies that the company had developed at PARC.

In fiscal 1979, sales were \$47.9 million and profits were \$7.1 million (Dow Jones, 1980a). With both a strong balance sheet and cash flow, in the fall of 1979 the company could begin planning its next generation of computer offerings, including the business-oriented Apple III and Lisa computers, both of which would be commercial failures (Apple III was discontinued in 1984 and Lisa in 1985), and the education- and home-oriented Macintosh "computer for the masses" (Isaacson, 2011: 94) that was, in its various models, the bedrock of Apple's success from 1984 to the beginning of the 2000s.

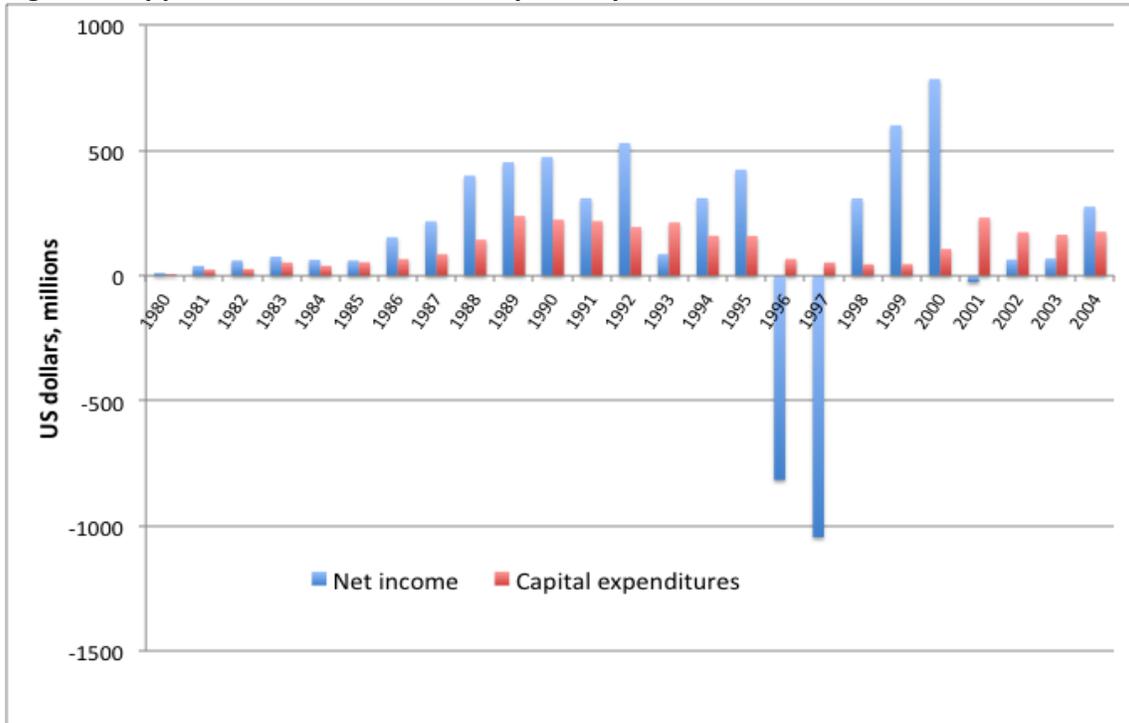
These projects were all begun in 1979, over a year before Apple's IPO on December 12, 1980, in which the company raised \$97 million (\$91 million after expenses and fees), listing on NASDAQ. Apple sold five million of the 52 million shares outstanding to the public. At the end of the first day of trading, the market placed a value on the company of \$1.56 billion (Dow Jones, 1980b).

The net amount of \$91 million that Apple raised in its IPO provided the company with financial security. However, these funds were *not* an important source of financial commitment. As observed in Figure 4, from 1980 through 1995, Apple's net income easily covered its capital expenditures. Moreover, as shown in Figure 5, in the years immediately following the IPO, the company was able to generate income that was just under 11 percent of sales while also spending over six percent of sales on R&D.

---

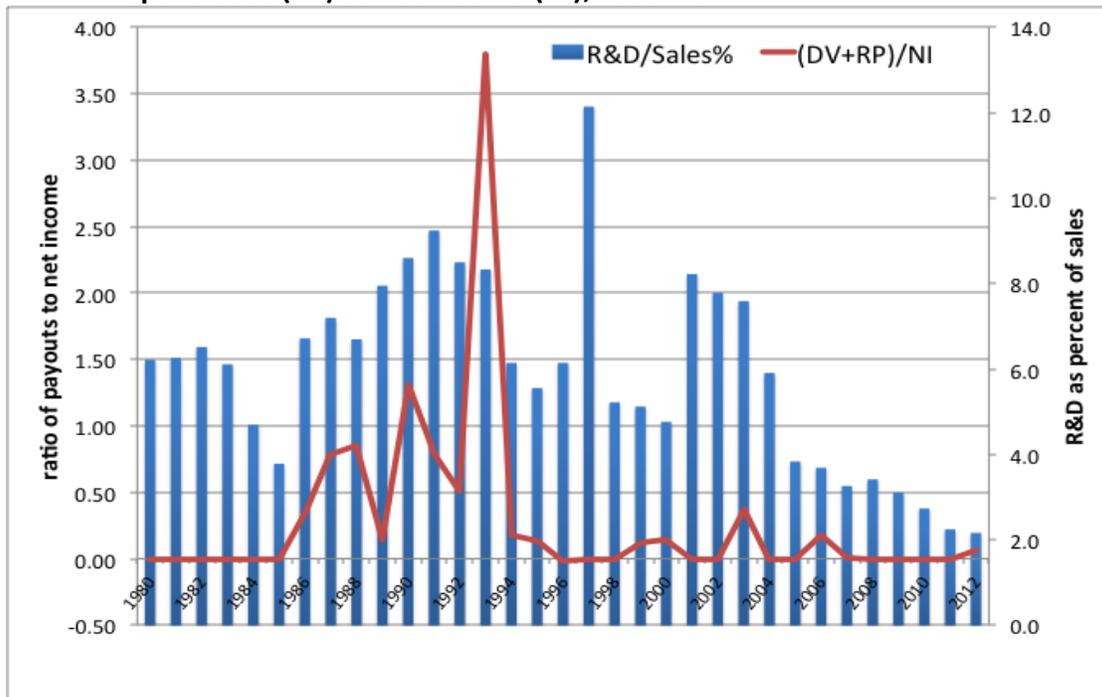
<sup>8</sup> For the role of SBICs in venture capital, Noone and Rubel, 1970; Kenney and Florida, 2000.

**Figure 4: Apple Inc., net income and capital expenditures, 1980-2004**



Source: Standard & Poor's Compustat database, annual.

**Figure 5: Apple Inc. R&D as percent of sales and dividends (DV) plus share repurchases (RP) to net income (NI), 1980-2012**

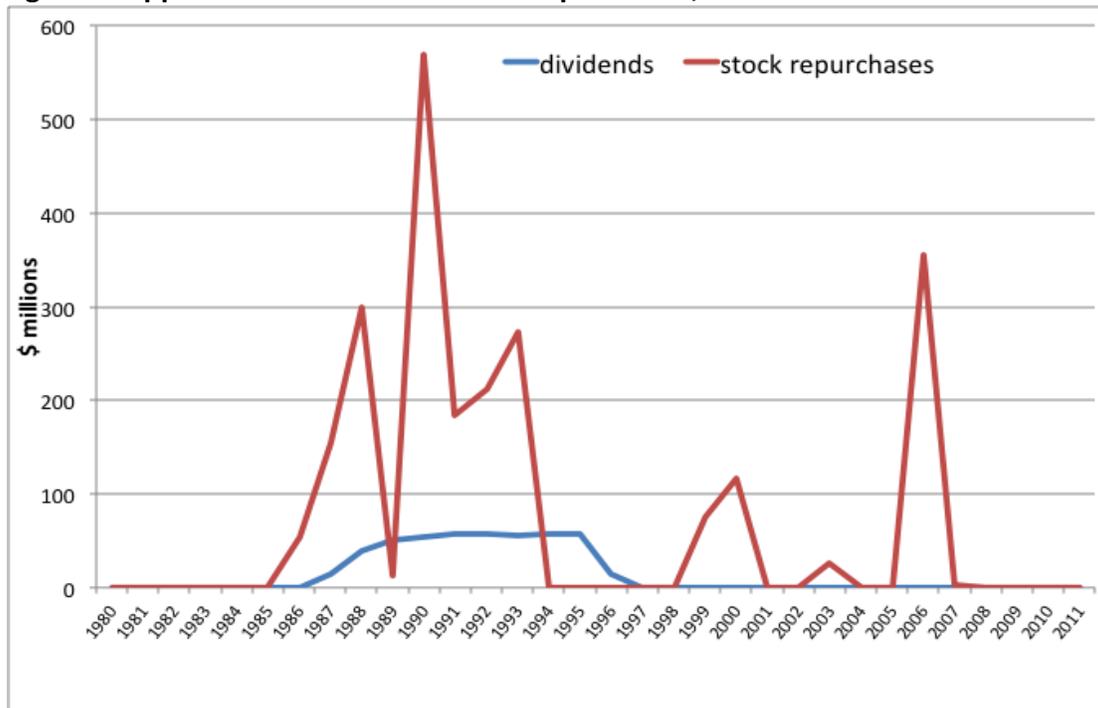


Source: Standard & Poor's Compustat database.

As can be seen in Figure 5, distributions to shareholders began to consume a substantial proportion of net income in 1986. Moreover, as Figure 6 shows, these distributions largely took the form of stock repurchases. Over the years from 1986 to 1996, dividends totaled \$457 million while at \$1,761 billion repurchases totaled nearly four times as much. While dividends rewarded shareholders for holding the company’s stock, repurchases rewarded shareholders for selling the company’s stock. The purpose of stock repurchases was to boost the company’s stock price, and the prime beneficiaries of these price boosts were the company’s top executives with their stock-based pay (Lazonick, 2009b; 2013b). During the Sculley-Spindler era, the remuneration of Apple’s top executives was lavish. For example, in 1988, Sculley was by far the highest paid executive in the U.S. computer and electronics industry (PR Newswire, 1989; Myers, 1991b).

Apple’s policy of “maximizing shareholder value” under Sculley’s reign did not end well. In 1994, after having spent \$273 million on stock repurchases in 1993 alone even as profits declined sharply, Apple was compelled to make a long-term bond issue of \$297 million. Then, in 1996, with the company sustaining losses of \$816 million, Apple made another long-term bond issue, this time for \$646 million in junk bonds, reflecting the rating agencies’ view of the company’s weakened financial condition.

**Figure 6: Apple Inc. dividends and stock repurchases, 1980-2011**



Source: Standard & Poor’s Compustat database, annual

Over the course of Apple’s history, the only times that shareholders provided the company with financial commitment was when venture capitalists backed the startup before its IPO in 1980 and public shareholders contributed \$97 million in the IPO.

When Apple went public, the private-equity interests cashed out handsomely. We can also assume that the public shareholders who bought stock in the 1980 IPO sold their stakes over the ensuing years to secure a healthy capital gain. Apple's employees have bought large amounts of Apple's stock as part of their stock-based remuneration systems: \$5.0 billion from 2004 through 2012, which were dwarfed, however, by profits of \$101.9 billion over this nine-year period. As we have observed in Table 2, employees who have been granted stock options have done extremely well by these transactions; their purpose in buying shares from their employer has been to turn around and sell the shares on the market at a higher price than they paid to Apple.

Hence the only time that Apple raised new funds from public shareholders was in its IPO in 1980, and those shareholders have long since reaped their returns on that investment. Indeed, when Apple's stock repurchases are taken into account, over its history the company has bought far more stock from public shareholders than public shareholders have bought from it.

Yet now that Apple has accumulated an enormous cash reserve, public shareholders are demanding that Apple "return" capital to them. In July 2012 Apple paid \$2.5 billion in dividends, its first such payout since October 1995 (not shown in Figure 6 because its size would make it difficult to read the historical series). Since then Apple has been paying dividends every quarter for a total of \$7.8 billion in the first three-quarters of fiscal 2013. Apple also expended just under \$2 billion on buybacks in the second quarter of 2013, and, under its \$60 billion repurchase program, expended \$16.0 billion in the third quarter of 2013.<sup>9</sup> In the concluding section of this paper, we raise the key issues at stake for business and government policy in how Apple uses its huge profits with respect to not only the company itself but also the U.S. corporate economy as a whole.

## **5) The End of Apple Innovation?**

In September 2010, David Einhorn of Greenlight Capital, a major hedge fund, bought a stake of approximately 1.4 million shares in Apple at about \$280 per share. When the stock price peaked at \$705 in September 2012, Einhorn could have sold the stock for a \$600 million gain. But he decided to hold on to the stock even as it plunged to less than \$450 per share in February 2013.

By that time, Apple had liquid assets of \$137 billion on its balance sheet. Greenlight wanted to get its hands on a chunk of that cash. According to a Greenlight press release issued on February 7, 2013,

---

<sup>9</sup> See Apple 10-Q for the quarterly period ending June 29, 2013: 5 and 15. Of the \$18 billion repurchased in the first nine months of 2013, \$4 billion was on the open market and \$14 billion through special arrangements with financial institutions.

at a May 2012 investment conference...Mr. Einhorn demonstrated that Apple could unlock several hundred billion dollars of shareholder value by distributing, to existing shareholders, a perpetual preferred stock. Since May Greenlight has had discussions with Apple on the value creation idea, but Apple rejected it outright in September 2012 (Greenlight Capital, 2013).<sup>10</sup>

By committing to disgorging its cash, Einhorn argued, Apple's stock price would rise by approximately \$150, a gain that would have been worth over \$200 billion to Greenlight Capital (Daly and Shahid, 2013). But Einhorn wanted more. His preferred share plan would have put him in possession of an additional valuable security that would yield a guaranteed dividend payment while he held it or extra cash when he sold it.

Apparently as a defense against Einhorn's scheme, Apple's management placed a proposal on the agenda for its Annual Meeting of Shareholders, to be held on February 27, 2013, to eliminate from the company's charter the authority to issue preferred stock. The adoption of this proposal would, according to Greenlight, "restrict the Board's ability to unlock the value on Apple's balance sheet."

Einhorn also sought to put pressure on Apple by filing a lawsuit about the way in which the proposal to eliminate preferred shares has been bundled with other proposals in the proxy statement (Raymond 2013). Apple immediately released a statement that its "management team and Board of Directors have been in active discussions about returning additional cash to shareholders. As part of our review, we will thoroughly evaluate Greenlight Capital's current proposal to issue some form of preferred stock" (Apple Inc., 2013b). At a Goldman Sachs technology conference on February 12, Apple CEO Tim Cook called the Greenlight proxy fight over the preferred share proposal a "silly sideshow", but pointed out that the previous March Apple had already committed to paying out \$45 billion in dividends and buybacks, and that Apple's board would "seriously consider returning additional cash to our shareholders. I think that's what our shareholders want and that's what we're going to do" (Bradshaw, 2013). Two months later, as we noted at the outset, Apple increased its payout program to \$100 billion over the next 32 months, with a planned \$40 billion in dividends and \$60 billion in buybacks.

In the highly financialized business environment of the United States, the Einhorns of the world, who have absolutely nothing to do with Apple as a company that employs people and produces products, now seem to have a preponderant influence in

---

<sup>10</sup> As Greenlight Capital (2013) went on to detail its plan, "Apple could initially distribute to existing shareholders \$50 billion of perpetual preferred stock, with a 4% annual cash dividend paid quarterly at preferential tax rates. Once a trading market is established and the market recognizes the attractiveness of a highly liquid, steady yielding instrument from an issuer backed by Apple's unmatched balance sheet and valuable franchise, the Board could evaluate unlocking additional value by distributing additional perpetual preferred stock to existing shareholders. With this conservative action, Greenlight believes the Board could unlock hundreds of billions of dollars of latent shareholder value."

determining Apple's future. Warren Buffett, who through his holding company Berkshire Hathaway has become one of the wealthiest people in the world by keeping money in value-creating businesses, in effect protecting them from value-extractors such as Einhorn, had some advice for Apple CEO Cook:

Noting that he has also faced criticism, especially during four periods over the decades that Berkshire Hathaway's stock had lost half its value, Buffett said if he were running Apple "I would ignore [Einhorn]. I would run the business in such a manner as to create value over the next five to 10 years. You can't run a business to try to run the stock up every day" (Crippen, 2013).

What are the implications for Apple's future of the fact that Cook has obviously not ignored Einhorn? How should Apple be running its business to create value over the next five to ten years, and beyond? First, there is the principle of "strategic control". Apple should ensure that resource allocation decisions are in the hands of people who have not only the ability but also the incentive to invest in innovative products that masses of people will want at prices that they can afford to pay. Second, there is the principle of "organizational integration". Apple's executives should recognize that the most critical investments that the company can make are in teams of people who over the course of their careers can integrate their skills and efforts to produce superior products using superior processes. Third, there is the principle of "financial commitment". Given its huge accumulation of liquid assets, Apple clearly has ample financial resources to invest in the information and communication technologies of the future.

We cannot predict the future, but we can learn the lessons of the recent past. Evidence from the close study of the changing business models of other iconic cash-rich high-tech companies such as Intel, Microsoft, and Cisco strongly suggests that when corporate executives who exercise strategic control become committed to "maximizing shareholder value" through massive stock repurchases they lose both the incentive and ability to invest in innovation (Lazonick, 2013a). Top executives lose the incentive to invest in innovation because, with their abundant US-style stock-based pay that typically rewards short-term boosts in stock prices, they are prime beneficiaries of stock-price manipulation through stock buybacks (Lazonick, 2009b). They eventually lose the ability to invest in innovation because they spend their time and effort thinking about extracting value that was created in the past rather than envisioning and implementing the innovative investment strategies that will create value in the future.

In the process these top executives adopt the language and mindset of value extractors such as Einhorn who, as quoted above, portrays his raid on the Apple corporate treasury as "unlocking shareholder value" and the particular method by which he seeks to get hold of this cash as a "value creation idea". Cook and the Apple board see themselves as "returning" cash to shareholders, even though the shareholders in question never invested cash in Apple in the first place. As we have seen in our account of Apple's history from its founding in 1976, the last and only time public

shareholders actually invested money in the company was in the 1980 IPO. At that time the original venture capitalists reaped ample returns on their investments of one to three years. And if (as is doubtful) any of the original public shareholders in Apple in 1980 still hold stock today, they have long since been amply rewarded for their loyalty – and they certainly would not need, or probably not even want, the company to be lavishing short-termers with tens of billions in buybacks.

In the aftermath of Einhorn’s efforts at massive value extraction, corporate lawyer Martin Lipton, who has spent a long career protecting incumbent management from shareholder attacks (inventing in the early 1980s, for example, the “poison pill” defense) issued a scathing critique of “activist hedge funds”, and the academics who give them credibility. In a memo entitled “Bite the Apple; Poison the Apple; Paralyze the Company; Wreck the Economy”, Lipton wrote:

The activist-hedge-fund attack on Apple—in which one of the most successful, long-term-visionary companies of all time is being told by a money manager that Apple is doing things all wrong and should focus on short-term return of cash—is a clarion call for effective action to deal with the misuse of shareholder power. Institutional investors on average own more than 70% of the shares of the major public companies. Their voting power is being harnessed by a gaggle of activist hedge funds who troll through SEC filings looking for opportunities to demand a change in a company’s strategy or portfolio that will create a short-term profit without regard to the impact on the company’s long-term prospects. These self-seeking activists are aided and abetted by Harvard Law School Professor Lucian Bebchuk who leads a cohort of academics who have embraced the concept of “shareholder democracy” and close their eyes to the real-world effect of shareholder power, harnessed to activists seeking a quick profit, on a targeted company and the company’s employees and other stakeholders. They ignore the fact that it is the stakeholders and investors with a long-term perspective who are the true beneficiaries of most of the funds managed by institutional investors (Lipton, 2013).

Unfortunately, as demonstrated by the \$100 billion capitulation of CEO Cook and Apple’s board to the activist hedge funds, incumbent management is deeply in bed with the value extractors. But who then are the value-creating stakeholders of whom Lipton speaks? The answer to this question requires a theory of innovative enterprise.

As we have seen, innovation requires strategic control because it is uncertain, organizational integration because it is collective, and financial commitment because it is cumulative. Innovative business enterprises make strategic investments that confront uncertainty through a process of organizational learning that is sustained by access to financial resources. When, however, the collective and cumulative character of the investments in new technologies that need to be made are too great for a business enterprise to undertake, it is only the State that has the incentive and ability

to make these investments. Hence the need for “the entrepreneurial state” (Mazzucato 2013a and 2013b).

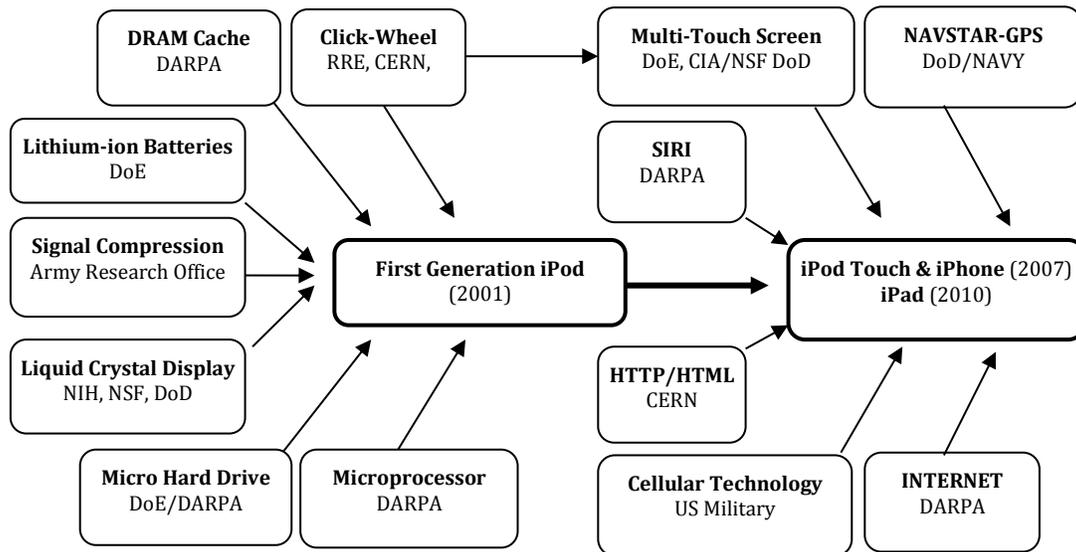
Once the State has made these highly uncertain investments, business enterprises can build upon them facing much less uncertainty about the prospects for transforming high fixed-cost investments into high-quality products that it can sell on markets at low units costs. Sometimes the State carries out these investments in new technologies in collaboration with universities and sometimes in collaboration with the research labs of large established business corporations.

Historically it was precisely these types of investments that by the 1970s made it possible for Apple to exist as a company in the first place. To enter into the computer business in the last half of the 1970s, Apple did not have to invent the integrated circuit. It did not have to invent the graphical user interface. It did not have to invent the Internet. Moreover, Apple did not have to build universities to educate engineers or roads to allow those graduate engineers to commute to work or the airplanes to carry goods and people around the world. Nor did Apple have to negotiate trade deals with the governments in Japan during 1980s and in China during 1990s to ensure access to growth markets for their products.

Operating in the United States, Apple should recognize that the knowledge base on which its success has been built can be traced back to government investments. As summarized in Figure 7 virtually every technology that one finds in an Apple iPod, iPhone, iPad touch originated in a government-run or government-funded investment project (Domestic Policy Council, 2006 8; McCray, 2009; Jenkins et al., 2010; Lazonick and Tulum, 2011; Trempath, 2011; Mazzucato 2013b: ch. 5).

Hence a significant portion of Apple’s profits should be going back to the U.S government to provide returns to taxpayers for the investments that they have made in the past and to help fund further government investment in society’s knowledge base that will provide the foundation for the technologies of the future. It is not just investment in government programs for advanced technologies that are at stake. An innovative enterprise such as Apple has benefited from public funding of the U.S. education system by federal, state, and local governments. At a time when the funding of the U.S. public education system is under great pressure, taxes on the gains of innovative enterprise are of immense importance for providing the returns to government that can fund investment in the productive capabilities essential for the next generation of innovative enterprise.

**Figure 7. The role of government agencies in developing the fundamental technologies of the iPod, iPhone, and iPad**



CERN: European Organization for Nuclear Research  
 CIA: Central Intelligence Agency  
 DARPA: Defense Advanced Research Projects Agency  
 DoD: Department of Defense

DoE: Department of Energy  
 NIH: National Institutes of Health  
 NSF: National Science Foundation  
 RRE: Royal Radar Establishment

Source: Figure researched and prepared by Öner Tulum for Mazzucato (2013b: 109), and adapted for this paper.

Yet far from recognizing the legitimate claims of U. S. taxpayers on a substantial portion of the company’s profits, Apple in essence runs a division of its company that is devoted to achieving excellence in tax avoidance (Hook and Yadron, 2013; Schwartz and Duhigg, 2013; Permanent Subcommittee on Investigations, 2013). Among other tax dodges, Apple, like all other U.S. multinational corporations, exploits a tax concession dating back to 1960 that exempts U.S. companies from taxation on profits at the standard 35 percent corporate tax rate until the profits are repatriated, thus giving these companies incentives both to account for profits as foreign and to keep their profits abroad (see Lazonick 2013b: 900-903).

With Apple being accused by the U.S. government of avoiding \$9 billion in taxes in 2012, at a U.S. Senate hearing on May 21, 2013 Cook stated that Apple had paid nearly \$6 billion dollars to the U.S. Treasury in the previous year and that “we pay all the taxes we owe, every single dollar” (Litvan and Shields, 2013; Shields, 2013). The written testimony submitted by Apple predicted that the company would pay over \$7 billion in profits to the U.S. Treasury in the current fiscal year (Apple Inc., 2013c). Unfortunately, in view of Apple’s plan to distribute \$100 billion in buybacks and dividends over the next two and a half years or so, announced just four weeks previously, none of the U.S.

Senators at the hearing questioned Cook on what he thought about the relative claims of U.S. taxpayers and Apple shareholders on Apple's profits.

Just as, through the U.S. government, U.S. taxpayers have made investments that have made Apple's growth and profits possible, so too have its employees. To be sure, in contributing to Apple's success, many of its employees have been rewarded with good pay and stable employment with Apple. Such distributions of the gains of a company's success are normal in innovative enterprises, and indeed that is how standards of living are raised for large numbers of people in the operation of a modern corporate economy (see e.g., Lazonick 2009a). In a world of increasingly intense global competition for markets in mobile information and communication devices, Apple will have to intensify its investments in organizational learning if it expects to produce the next round of world-class products. For Apple to remain an exemplar of innovative enterprise, it will have to provide stable and remunerative career opportunities for its professional, technical, and administrative employees not only to improve and sell its existing line of products but also to become a leader in developing the technologies of the future.

Our research also shows that once companies become financialized, as manifested by allocating billions of dollars to stock buybacks, sooner or later it is at the expense of the claims on a share in profits by loyal, hard-working, and experienced workers (Lazonick 2013b; Lazonick and Mazzucato, 2013). The financialized company begins to see productive employees as a profit-reducing expense rather than as a value-creating asset. Captured by shareholder value ideology, Cook and his top executive team have opted to support value extraction rather than value creation. In taking this position, they are adapting to a set of norms that since the 1980s have taken hold of US business, resulting in instability and inequity while undermining the conditions of innovative enterprise (Lazonick 2013b).

In other words, Apple is becoming a typical American corporation. Scully et al. tried that back in the late 1980s and early 1990s, and failed. Steve Jobs came back to lead Apple to its current position as the world's most successful company by reinstating the social conditions of innovative enterprise. Now, however, shareholder-value ideology is far stronger than it was two decades ago, and Steve Jobs cannot return. With its new financialized business model, Apple appears to be quickly transforming from exceptional to ordinary. With the "end of innovation" no longer driving the company, we predict that the end of innovation will be Apple's fate.

## References

- Apple Computer Inc. (1977). Preliminary Confidential Offering Memorandum, July, <http://archive.computerhistory.org/resources/text/2009/102712693.05.01acc.pdf>
- Apple Inc. (2013a). "Apple more than doubles capital return program," Apple press info, 23 April 23, at <http://www.apple.com/pr/library/2013/04/23Apple-More-than-Doubles-Capital-Return-Program.html>
- Apple Inc. (2013b). "Statement by Apple," Apple press info, February 7, at <http://www.apple.com/pr/library/2013/02/07Statement-by-Apple.html>
- Apple Inc. (2013c). "Testimony of Apple Inc. Before the Permanent Subcommittee of Investigations, U.S. Senate, May 21, at [http://www.apple.com/pr/pdf/Apple\\_Testimony\\_to\\_PSI.pdf](http://www.apple.com/pr/pdf/Apple_Testimony_to_PSI.pdf).
- Best, M. H. (1990). *The New Competition: Institutions of Industrial Restructuring*, Harvard University Press.
- Bick, J. (2005). "The Microsoft millionaires come of age," *New York Times*, May 29.
- Bradshaw, T. (2013). "Cook shrugs off activist lawsuit but considers bigger slice of Apple's \$137bn pie for investors," *Financial Times*, February 13.
- Business Times Singapore (1989). "Hon Hai to upgrade Singapore sales office," *Business Times Singapore*, July 8.
- Chandler, A. D. Jr. (2001). *Inventing the Electronic Century: The Epic Story of the Consumer Electronics and Computer Science Industries*, Free Press.
- Cook, L. (1977). "Get ready for friendly home computers," *Washington Post*, November 27.
- Crippen, A. (2013). "Buffett's Advice to Apple's Tim Cook: Ignore Einhorn," *CNBC*, March 4, at <http://www.cnbc.com/id/100519069>
- Daly, K., and M. U. Shahid (2013) "Apple's recent shareholder battle points to broader institutional investor trends," *SNL Kagan Media & Communications Report*, March 6.
- Domestic Policy Council (2006). "American Competitiveness Initiative: Leading the World in Innovation," Office of Science and Technology Policy, at <http://www.innovationtaskforce.org/docs/ACI%20booklet.pdf>
- Dow Jones News Service (1980a) "Apple Computer files initial offering of \$4.5 million," November 6.

Dow Jones News Service (1980b) "Apple Computer shares sold out," December 12.

Gibbs, M., and M. Beer (1991). "Apple Computer (B): Managing Morale and Corporate Culture," Harvard Business School Case 9-491-041, November 18.

Freiberger, P., and M. Swaine (2000). *Fire in the Valley: The Making of the Personal Computer*, McGraw-Hill, second edition.

Glimstedt, H., W. Lazonick, and H. Xie (2006). "Evolution and Allocation of Stock Options: Adapting US-Style Compensation to the Swedish Business Model," *European Management Review*, 3, 3: 1-21.

Grad, B. (2007). "The Creation and the Demise of Visicalc," *IEEE Annals of the History of Computing*, July-September: 20-31.

Greenlight Capital (2013). "Greenlight Capital urges Apple shareholders to oppose company's proposal that would impede Apple's ability to unlock shareholder value," press release, February 7, at <http://finance.yahoo.com/news/greenlight-capital-urges-apple-shareholders-133000002.html>

Gupta, P. (2012). "Apple CEO gives up \$75 million in dividend income," *Reuters News*, May 24.

Hertzfeld, A. (1981). "Reality Distortion Field," *Folklore*, February, at [http://folklore.org/StoryView.py?project=Macintosh&story=Reality\\_Distortion\\_Field.txt](http://folklore.org/StoryView.py?project=Macintosh&story=Reality_Distortion_Field.txt)

Hiltzik, M. (1999). *Dealers of Lightning: Xerox PARC and the Dawn of the Computer Age*, HarperBusiness.

Hook, J., and D. Yadron (2013). "Apple CEO Cook, lawmakers square off over taxes," *Wall Street Journal*, May 21.

Hormby, T. (2010). "The Story Behind Apple's Newton," *Gizmodo*, at <http://gizmodo.com/5452193/the-story-behind-apples-newton>

Isaacson, W. (2011). *Steve Jobs*, Simon & Schuster.

Jenkins, J., D. Swezey, and Y. Borofsky (2010). *Where Good Technologies Come From: Case Studies in American Innovation*, Breakthrough Institute, December, at <http://thebreakthrough.org/blog/Case%20Studies%20in%20American%20Innovation%20report.pdf>.

Kahney, L. (2010). "Being Steve Jobs' boss," *Bloomberg BusinessWeek*, October 24.

Kehoe, L. (1997). "Doubts grow about leadership at Apple," *Financial Times*, February 25.

Kenney, M., and R. Florida (2000). "Venture Capital in Silicon Valley: Fueling New Firm Formation," in Martin Kenney, ed., *Understanding Silicon Valley: The Anatomy of an Entrepreneurial Region*, Stanford University Press: 98-123.

Lazonick, W. (2009a). *Sustainable Prosperity in the New Economy? Business Organization and High-Tech Employment in the United States*, Upjohn Institute for Employment Research.

Lazonick, W. (2009b). "The Explosion of Executive Pay and the Erosion of American Prosperity," *Entreprises et Histoire*, 57, 2009: 141-164.

Lazonick, W. (2010). "Innovative Business Models and Varieties of Capitalism: Financialization of the US Corporation," *Business History Review*, 84, 4: 675-702.

Lazonick, W. (2011). "Apple's jobs: A rebirth of innovation in the U.S. economy?" *New Deal 2.0*, August 4, archived at <http://www.rooseveltinstitute.org/new-roosevelt/apple-s-jobs-rebirth-innovation-us-economy>

Lazonick, W. (2013a). "Investing for the Future or Living Off the Past? How Stock Buybacks Can Damage Your Company and Your Country," theAIRnet working paper, June, available on request from the author.

Lazonick, W. (2013b). "The Financialization of the U.S. Corporation: What Has Been Lost, and How It Can Be Regained," *Seattle University Law Review*, 36; 857-909;

Lazonick, W. (2013c). "The Theory of Innovative Enterprise: A Foundation of Economic Analysis," theAIRnet working paper, February, at <http://www.theairnet.org/files/research/lazonick/Lazonick%20The%20Theory%20of%20Innovative%20Enterprise%2020130501.pdf>

Lazonick, W., and M. Mazzucato (2013). "The Risk-Reward Nexus in the Innovation-Inequality Relationship: Who Takes the Risks? Who Gets the Rewards?," *Industrial and Corporate Change*, 22, 4 (forthcoming).

Lazonick, W., and M. O'Sullivan (2000). "Maximizing Shareholder Value: A New Ideology for Corporate Governance," *Economy and Society*, 29, 1: 13-35.

Lazonick, W., and Ö. Tulum (2011). "US Biopharmaceutical Finance and the Sustainability of the Biotech Business Model," *Research Policy*, 40, 9: 1170-1187

Lazonick, Mazzucato, and Tulum

Leading Company (2012). "iPerks: Apple, like others, takes steps to woo employees," *Leading Company*, November 21.

Lillington, K. (1997). "Apple picks itself up to hobble next furlong," *Irish Times*, October 31.

Linzmayer, O. W. (1999). "The Copland Crisis," at <http://macspeedzone.com/archive/art/con/be.shtml>

Lipton, M. (2013). "Bite the Apple; Poison the Apple; Paralyze the Company; Wreck the Economy," memorandum, Wachtell, Lipton, Rosen, and Katz, February 26, at <http://blogs.law.harvard.edu/corpgov/2013/02/26/bite-the-apple-poison-the-apple-paralyze-the-company-wreck-the-economy/>.

Litvan, L., and T. Shields (2013). "Apple seen using loopholes to avoid \$9 billion in taxes," *Bloomberg BusinessWeek*, May 21.

Mazzucato, M. (2013a). "Taxpayers Helped Apple But Apple Won't Help Them," *Harvard Business Review blog*, March 8, [http://blogs.hbr.org/cs/2013/03/taxpayers\\_helped\\_apple\\_but\\_app.html](http://blogs.hbr.org/cs/2013/03/taxpayers_helped_apple_but_app.html).

Mazzucato, M. (2013b). *The Entrepreneurial State: Debunking Private vs. Public Sector Myths*, Anthem Press, 2013.

McCray, W. P. (2009). "From Lab to iPod: A Story of Discovery and Commercialization in the Post-Cold War Era," *Technology and Culture*, 50, 1: 58-81.

Moritz, M. (2010). *Return to the Little Kingdom: How Apple and Steve Jobs Changed the World*, The Overlook Press, second edition

Myers, L. (1991a). "Workers angry over Apple job cuts demonstrate," *Associated Press*, June 19.

Myers, L. (1991b) "Apple lays off 900, Sculley, top executives, take pay cuts" *Associated Press News Archives*, June 21.

Noone, N., and S. W. Rubel (1970) *SBICs: Pioneers in Organized Venture Capital*, Capital Publishing Company.

O'Sullivan, M. (1998). "Sustainable Prosperity, Corporate Governance, and Innovation in Europe," in J. Michie and J. G. Smith, eds. *Globalization, Growth, and Governance: Creating an Innovative Economy*, Oxford University Press: 180-203.

Permanent Subcommittee on Investigations, Committee on Homeland Security and Governmental Affairs (2013). "Memorandum: Offshore Profit Shifting and the U.S. Tax

Code - Part 2 (Apple Inc.),” and “Exhibits: Hearing on Offshore Profit Shifting and the U.S. Tax Code - Part 2 (Apple Inc.),” United States Senate, May 21, at [http://www.hsgac.senate.gov/subcommittees/investigations/hearings/offshore-profit-shifting-and-the-us-tax-code\\_-part-2](http://www.hsgac.senate.gov/subcommittees/investigations/hearings/offshore-profit-shifting-and-the-us-tax-code_-part-2).

Pfeffer, J., and J. F. Veiga (1999). “Putting People First for Organizational Success,” *Academy of Management Executive*, 13, 2: 37-48.

Pollack, A. (1991). “Making a difference: Apple’s man at the front,” *New York Times*, October 6.

Pollack, A. (1993). “Next Inc. returns to center stage,” *New York Times*, September 19.

Polsson, K. (2013). “Chronology of Apple Computer Personal Computers,” at <http://pctimeline.info/apple/>.

PR Newswire (1989). “Sluggish pay for top electronics and computer executives,” *PR Newswire*, September 26.

Printing World (1997). “Free advice for Apple,” *Printing World*, October 13.

Raymond, N. (2013). “Einhorn case against Apple rests on unusual legal tactic,” *Reuters News*, February 8.

Reuters News (1996). “Apple drops to third place in the world PC market,” *Reuters News*, January 29.

Segal, D. (2012). “Apple’s retail army, Long on loyalty but short on pay,” *New York Times*, June 24.

Schlender, B., and M. H. Martin (1996). “Paradise lost: Apple’s quest for life after death,” *Fortune*, February 19.

Schwartz, N. D., and C. Duhigg (2013). “Apple’s web of tax shelters saved it billions, panel finds,” *New York Times*, May 20.

Shah, D. (2007). “Top 10 Apple products which flopped,” *Newlaunches.com*, at [http://www.newlaunches.com/archives/top\\_10\\_apple\\_products\\_which\\_flopped.php](http://www.newlaunches.com/archives/top_10_apple_products_which_flopped.php).

Shields, T. (2013). “Apple CEO Cook rebuts \$9 billion tax avoidance claim,” *Bloomberg.com*, May 21, at <http://www.bloomberg.com/news/2013-05-21/apple-ceo-cook-rebuts-9-billion-tax-avoidance-claim.html>.

Lazonick, Mazzucato, and Tulum

Trembath, A. (2011). "The iPhone and the Invisible Hand of Government," The Breakthrough Institute, October 5, at [http://thebreakthrough.org/archive/the\\_iphone\\_and\\_the\\_invisible\\_h](http://thebreakthrough.org/archive/the_iphone_and_the_invisible_h).

Yoffie, D. (1994). "Reshaping Apple Computer's Destiny," Harvard Business School Case 9-393-011, January 14.

Zachary, P. G. (1990). "Bruised Apple: Computer firm's chief faces slowing growth, discord in the ranks," *Wall Street Journal*, February 15.

## Acknowledgments

The research for this paper has been funded with grants from the Institute for New Economic Thinking (“The Stock Market and Innovative Enterprise” and Impatient Capital in High-Tech Industries”) and the Ford Foundation (“Financial Institutions for Innovation and Development”).

The authors thank Matt Hopkins for his comments on this paper.

## About theAIRnet

The Academic-Industry Research Network – theAIRnet – is a private, 501(c)(3) not-for-profit research organization devoted to the proposition that a sound understanding of the dynamics of industrial development requires collaboration between academic scholars and industry experts. We engage in up-to-date, in-depth, and incisive research and commentary on issues related to industrial innovation and economic development. Our goal is to understand the ways in which, through innovation, businesses and governments can contribute to equitable and stable economic growth – or what we call “sustainable prosperity”.

## Contact

12 Newport Road  
Cambridge, Massachusetts  
02140 USA  
[www.theAIRnet.org](http://www.theAIRnet.org)

We are on the web!

Follow us @



Phone: 617-576-0880

Mobile: 781-308-7948

Fax: 781-803-3366

Email: [info@theAIRnet.org](mailto:info@theAIRnet.org)

**theAIRnet**<sup>®</sup>  
The Academic-Industry Research Network