The New Economy Business Model and the Crisis of US Capitalism

William Lazonick
Center for Industrial Competitiveness
University of Massachusetts Lowell
and
Groupe de Recherche en Economie Théorique et Appliquée
Université Montesquieu-Bordeaux IV

william_lazonick@uml.edu

September 19, 2009

Published in *Capitalism and Society*, 4, 2, 2009.

This paper summarizes and expands upon arguments in my book, Sustainable Prosperity in the New Economy?: Business Organization and High-Tech Employment in the United States, Upjohn Institute for Employment Research, forthcoming in September 2009. For the sake of exposition, I have omitted detailed bibliographic references, except where quoting directly or citing distinctive facts. Complete references can be found in the book.

I would like to thank Mustafa Erdem Sakinc, Shuwen Liu, and Yue Zhang for assistance in updating the stock option and stock repurchase data for this paper.

The research in this paper was funded by the Upjohn Institute for Employment Research, the ESEMK project of the European Commission under the 6th Framework Programme (contract CIT2-CT-2004-506077). This project is now being supported financially by the FINNOV project of the European Commission under the 7th Framework Programme (FP7/2007-2011; grant agreement number 217466).

Abstract

Driven by industrial innovation, in the last half of the 20th century the population of the United States attained, on average, a very high standard of living. Yet, in the first decade of the 21st century, large numbers of Americans are economically insecure. In this paper, I summarize the findings of my research into the ways in which over the past three decades the transformation of the dominant "business model" that prevails in the information and communication technology industries has contributed to the rise of economic insecurity in the United States. I describe how the "Old Economy business model" (OEBM) that was in place in the immediate post-World War II decades gave way to the "New Economy business model" (NEBM) that is now ubiquitous in US high-tech industry. Under OEBM, an employee could hold the realistic expectation of a career with one company. Under NEBM, career employment depends much more on interfirm labor mobility, which in and of itself makes continuous employment less certain. Nevertheless, in the ICT industries, NEBM has also been an engine of economic growth so that a strong demand for high-tech labor can potentially offset a lack of employment security with one company. Since the early 1990s, however, this demand for high-tech labor has tended to be a demand for qualified *lower-wage* labor, which has meant that ICT companies have favored the employment of younger workers over older workers and of workers in developing nations over workers in the United States. At the same time, acting as both a motive for employing lower-wage labor and as a rationale for laying off experienced workers has been the adherence of US corporate executives to the ideology that their companies should be run to "maximize shareholder value". The most important manifestation of the influence of this ideology on corporate resource allocation is the extent to which US companies repurchase their own stock to support their stock prices. I conclude this essay by arguing that neither the ideology of maximizing shareholder value nor the practice of stock repurchases has any economic merit. Indeed both must bear the blame for contributing to the rise of economic insecurity in the United States.

Business Models, Old and New

Driven by industrial innovation, in the last half of the 20th century the populations of the advanced nations of North America and Europe attained, on average, very high standards of living. Yet, in the first decade of the 21st century, large numbers of people in these nations are economically insecure. Such is particularly the case in the United States, the world's largest economy, where, even before the current financial crisis, employment income had become unstable and retirement income unpredictable.

For many people in the United States, home ownership has complemented employment and retirement income as a source of economic security. Yet the rise in "subprime" mortgages that preceded and precipitated the current financial crisis reflected a lack of stable and remunerative employment opportunities for large segments of the population. The fact that Wall Street banks and insurance companies were willing and able to use the subprime mortgage market as a foundation for making mammoth bets on financial derivatives is a statement of the extent to which the fortunes of the rich and poor have become inextricably joined, for better or, as we can now see, for worse.

In between the rich and poor in a highly unequal economy is the disappearing "middle class". In an age of corporate cost-cutting and offshoring, often in the name of "maximizing shareholder value", economic insecurity confronts not only the poorer segments of the population but also large numbers of better educated people with ample work experience and considerable skill. The movement of emerging economies such as those of China and India into higher value-added activities has created new competition for the jobs of well-educated and highly experienced workers in the United States. During the 2000s, even in growing high-tech industries, a college education has no longer offered assurance of stable and well-paid employment. If economic insecurity afflicts the best-positioned members of the US labor force in the most dynamic growth industries, what prospects are there for increasing the economic security of less educated workers in low-growth industries?

In this paper, I summarize the findings of my research into the ways in which over the past three decades the transformation of the dominant "business model" that prevails in the information and communication technology (ICT) industries[1] has contributed to the rise of economic insecurity in the United States. I describe how the "Old Economy business model" (OEBM) that was in place in the immediate post-World War II decades gave way to the "New Economy business model" (NEBM) that is now ubiquitous in US high-tech industry.

Under OEBM, an employee could hold the realistic expectation of a career with one company. In the 1980s and 1990s, however, older companies, many with their origins in the late 19th century, engaged in a process of redistributing corporate revenues from labor incomes to capital incomes. Engaging in a "downsize-and-distribute" allocation regime, these companies downsized their labor forces and increased the distribution of corporate revenues to shareholders. This downsize-and-distribute allocation regime represented a reversal of the "retain-and-reinvest" regime that had characterized these companies in the post-World War II decades. Companies had retained corporate revenues for reinvestment in organization and technology, expanding their labor forces in the process. Coming into the 1980s, employees – both managerial personnel and shop-floor workers – had

[1] I define the ICT industries as those engaged in producing computer hardware, computer software and services, communications equipment, and communications services.

expectations, based on over three decades of experience of a retain-and-reinvest regime, of long-term employment with these corporations.

Under NEBM, career employment depends much more on interfirm labor mobility, which in and of itself makes continuous employment less certain. Nevertheless, in the ICT industries, NEBM has also been an engine of economic growth so that a strong demand for high-tech labor can potentially offset a lack of employment security with one company. Since the early 1990s, however, this demand for labor has tended to be a demand for qualified *lower-wage* labor, which has meant that ICT companies have favored the employment of younger workers over older workers and of workers in developing nations over workers in the United States. At the same time, acting as both a motive for employing lower-wage labor and as a rationale for laying off experienced workers has been the adherence of US corporate executives to the ideology that their companies should be run to "maximize shareholder value". The most important manifestation of the influence of this ideology on corporate resource allocation is the extent to which US companies repurchase their own stock to support their stock prices.

We can define a business enterprise by the product markets for which it competes and the ways in which it mobilizes capital and labor to compete for those markets. Hence a "business model" can be characterized by its *strategy*: the types of goods and services that the enterprise produces and the types of processes through which it produces them; its *finance*: the ways in which it funds investments in processes and products until they can generate financial returns; and its *organization*: the ways in which it elicits skill and effort from its labor force to add value to these investments. Table 1 contrasts the strategic, financial, and organizational characteristics of OEBM and NEBM in the ICT industries. In the context of the microelectronics revolution, the distinctive characteristics of NEBM have made it a powerful engine of economic growth. As I shall show, however, this business model has now become a source of instability and inequity in the US economy.

In the next section of this paper, I outline how NEBM replaced OEBM, including an explanation of the impetus to the employment of lower-wage, and generally younger, workers under NEBM. In the following section, I show how and why US ICT companies have been able increasingly to find qualified low-wage workers in developing countries, especially China and India. Then I summarize how, in their quest for "shareholder value", these companies have been using their profits, including profits from employing a low-wage global labor force, to do massive buybacks in the attempt to boost their stock prices rather than keep educated and experienced members of the labor force productively employed in the United States. I conclude this essay by arguing that neither the ideology of maximizing shareholder value nor the practice of stock repurchases has any economic merit. Indeed both must bear the blame for contributing to the rise of economic insecurity in the United States.

Table 1: Old Economy Business Model (OEBM) and New Economy Business Model (NEBM) in the Information and Communication Technology (ICT) Industries

	OEBM	NEBM
Strategy, product	Growth by building on internal capabilities; business expansion into new product markets based on related technologies; geographic expansion to access national product markets.	New firm entry into specialized markets; sale of branded components to system integrators; accumulation of new capabilities by acquiring young technology firms.
Strategy, process	Corporate R&D labs; development and patenting of proprietary technologies; vertical integration of the value chain, at home and abroad.	Cross-licensing of technology based on open systems; vertical specialization of the value chain; outsourcing and offshoring.
Finance	Venture finance from personal savings, family, and business associates; NYSE listing; payment of steady dividends; growth finance from retentions leveraged with bond issues.	Organized venture capital; initial public offering on NASDAQ; low or no dividends; growth finance from retentions plus stock as acquisition currency; stock repurchases to support stock price.
Organization	Secure employment: career with one company; salaried and hourly employees; unions; defined-benefit pensions; employer-funded medical insurance in employment and retirement.	Insecure employment: interfirm mobility of labor; broad-based stock options; non-union; defined-contribution pensions; employee bears greater burden of medical insurance.

The Transformation from OEBM to NEBM

Product Strategy

A specialized semiconductor industry, of which the dominant company is Intel, has provided the foundation for the vertical structure of the microelectronics sector. This vertical structure was the end result of three waves of semiconductor startups in the region around Stanford University that began with the formation of Fairchild Semiconductor in 1957. In the first wave in the late 1950s and early 1960s, firms produced transistors and integrated circuits primarily for the US military. During these years innovation in the manufacture of silicon chips and a growing extent of the market reduced the price of integrated circuits, thus making their use in commercial products increasingly feasible. In the second wave in the late 1960s and early 1970s, startups like Intel and Advanced Micro Devices (AMD) produced memory chips, with circuits etched in silicon, for commercial uses. The term “Silicon Valley” was coined in 1971. By the late 1970s Japanese semiconductor producers were effectively competing in memory chips, and in the mid-1980s largely forced US producers out of this market. In the third wave in the late 1970s and early 1980s, US semiconductor companies focused much

more on the design of chips such as microprocessors that had computer programs embedded in them. Subsequently there was further vertical specialization into "fabless" chip design houses that outsourced the manufacture of their semiconductor products to foundries, a vertical layer in which the Taiwanese came to excel.

Historically, however, vertical specialization of the microelectronics industries was not preordained. In the 1970s IBM was the leading producer of semiconductors, but exclusively as components for its own products. The leading merchant producers in the 1970s and indeed throughout the 1980s were Motorola with its main semiconductor facilities in Phoenix, Arizona, and Texas Instruments (TI), headquartered in Dallas, Texas. Both companies had originally developed semiconductors for their own final products; in the case of Motorola for its radios and pagers, and in the case of TI for its oil exploration equipment, computers, hand-held calculators, and electronic toys. They also, however, expanded their semiconductor businesses by selling chips to other companies.

Indeed, even for the major Silicon Valley semiconductor companies in the 1970s, vertical specialization in chips was *a competitive outcome, and not a strategic choice*. A 1979 *New York Times* article entitled "The Cloning of I.B.M.'s Computers," observed: "It is almost axiomatic in the electronics industry that companies in the semiconductor business want to go into end-user businesses, in other words to vertically integrate into finished products and systems" (Schuyten 1979). In the 1970s National Semiconductor and Fairchild produced calculators, and Intel, National, and Fairchild produced digital watches. National also manufactured checkout scanners, and made money in that business before being outcompeted by IBM and NCR. Following the lead of Silicon Valley-based Amdahl, National had also entered the plug-compatible mainframe (PCM) market, producing clones of IBM's machines. By the early 1980s, however, all of National's PCMs were manufactured by Hitachi, and in 1989, Hitachi and Electronic Data Systems bought National's mainframe business.

In addition, leading Silicon Valley semiconductor companies, including Intel, National, and Intel-spinoff Zilog entered the minicomputer industry in the late 1970s and early 1980s. They were, however, outcompeted not only by the Japanese but also by firms such as Digital Equipment Corporation (DEC) and Data General in the Route 128 high-tech corridor to the north and west of Boston as well as by IBM and Hewlett-Packard (HP). In 1981 Intel entered the microcomputer industry, one in which National was already engaged using Intel's 8086 microprocessor. Intel's director of corporate planning, Les Vadasz, argued that Intel's forward integration into microcomputers was strategic: "We develop products because they fit into our overall architecture of things" (Business Week 1981).

But 1981 was also the year that IBM launched its personal computer, which became known as the PC. In 1982 IBM's PC sales were $500 million and just two years later 11 times that amount, more than triple the 1984 revenues of its nearest competitor, Apple, and about equal to the revenues of IBM's top eight rivals (Chandler 2001, 118-119). The success of the IBM PC consolidated the vertical structure of the microcomputer industry by outsourcing the microprocessor to Intel and the operating system to Microsoft. As a result, Intel defined itself as a vertically specialized chip producer. Microsoft became the world's leading software producer, and in the last half of the 1990s integrated forward into Internet browsers and videogame consoles.

The domination by Intel and Microsoft of the product markets for microprocessors and operating software respectively created an immense barrier to entry to actual and potential competitors who would *directly* confront the New Economy giants. At the same time, however, the emergence of "open systems" standards for the computer industry created countless opportunities for new entrants to develop specialized niche products that conformed to the "Wintel" architecture.

Process Strategy

The open-systems standards that resulted from the dominance of the Wintel architecture favored cross-licensing of technology, strategic alliances, and outsourcing of components rather than in-house proprietary research and vertical integration of the supply chain. The adoption of open-systems standards provided the technological rationale for Old Economy companies such as IBM and HP to make the transition from OEBM to NEBM. In the 2000s these two companies have been the world's largest ICT enterprises.

During the 1990s, as IBM scaled back its rate of R&D expenditure, it ramped up its patenting activity. In 1989 and 1990 IBM was 9th in the number of US patents awarded, in 1991 8th, and in 1992 6th. With a 29 percent increase in patents awarded in 1993 over the previous year, IBM moved into the number one spot, and has maintained that position in every subsequent year to the present. The main purpose of this patenting activity has been to enhance the capability of the company to network in an open-systems world rather than to protect proprietary technologies. During the last half of the 1990s, IBM began using its intellectual property to generate significant licensing revenues and as the basis for multibillion-dollar OEM partnerships with other ICT companies.

In 1984, with the PC revolution in full swing, HP made a strategic decision to manufacture its computer products to comply with the open systems that had emerged in the information technology industry (Hewlett-Packard 1984, 11). Based largely on this open-systems strategy, from 1983 to 1998 HP's revenues increased from $4.7 billion to $47.1 billion, representing an expansion of 6.1 times in real dollars. HP achieved this six-fold increase in real revenues, moreover, with an expansion in employment of only 1.7 times – from 72,000 to 142,600 – with the result that sales per employee in 1998 dollars increased by 3.5 times, from $107,000 to $378,000.

Selling consumer-oriented products in markets in which price competition is intense, HP is no longer the engineers' company that William Hewlett and David Packard built starting in 1939. In 2000-2008 HP's R&D expenditures were only 4.7 percent of sales, reaching an all-time low of 3.2 percent in 2008, compared with annual averages of 10.3 percent in the 1980s and 8.2 percent in the 1990s. At the same time, HP has advanced to the top ranks in patenting. Many of HP's patents are on its ink; the purpose of these ink patents is not only to improve product quality but also to block companies that cut into its revenues and profits by refilling and refurbishing empty print cartridges.

The move to open systems meant that components became modular with standard interfaces for system integration, thus facilitating the growth of electronic manufacturing service (EMS) providers to which components could be outsourced. The outsourcing of components produced to industry standards made original equipment manufacturers such as IBM and HP less concerned about revealing proprietary knowledge. Having adopted open-systems strategies, IBM and HP led the way among Old Economy companies in outsourcing components to EMS providers such as Solectron and SCI. Indeed, in the

mid-1990s IBM spun off its manufacturing subsidiary, IBM Canada, as an independent EMS provider, Celestica. Thus open systems encouraged vertical specialization.

Finance

Open systems and vertical specialization in microelectronics created opportunities to set up new firms to compete for niche markets. By the 1980s the United States had a well-developed venture-capital industry that could devote itself to funding these startups. The emergence of this venture-capital industry resulted from the co-evolution of venture-capital firm entrants and microelectronics startups in the Silicon Valley region. As with the founding of semiconductor firms, the pattern of venture-capital firm entrants exhibits three waves of growing amplitude, the first around 1958-1962, the second around 1968-1972, and the third around 1978-1983.

There was little involvement of San Francisco Peninsula venture capital with semiconductor startups until the second wave.[2] That involvement picked up slowly in the middle of the second wave, and toward the end of the period, the semiconductor industry began contributing some of its well-known executives to the venture-capital industry. In 1972 Donald Valentine, an engineer who had been head of marketing at Fairchild before joining National in 1967, founded Sequoia Capital, which became one of Silicon Valley's most successful venture-capital firms. Also in 1972 Eugene Kleiner, one of the original founders of Fairchild, joined with HP executive Thomas Perkins to found a venture-capital firm, Kleiner Perkins, which, renamed Kleiner Perkins Caufield & Byers in 1978, is commonly considered to be the exemplar of Silicon Valley venture capital.

Kleiner Perkins set up its offices in a new complex at 3000 Sand Hill Road in Menlo Park, adjacent to Stanford and with easy access to the San Jose and San Francisco airports. Sequoia also located there, as did many other Silicon Valley venture-capital firms along with the Western Association of Venture Capitalists which spawned the National Venture Capital Association (NVCA) in 1973. The second wave of semiconductor startups, therefore, not only gave Silicon Valley its name but also laid the foundation for an organized venture-capital industry.

In the 1980s technology-oriented venture-capital firms had become integral to both Silicon Valley and NEBM. These firms were organized as general partnerships of venture capitalists who 1) raised funds, largely from institutional investors such as pension funds, universities, and financial institutions; 2) reviewed and selected the particular portfolio of industrial ventures in which to invest; 3) maintained control over resource allocation *to* these ventures, including the staging of funding as the venture evolved; 4) maintained control over resource allocation *by* these ventures, including the hiring and firing of executive personnel; and 5) sought to realize returns to the venture-capital fund through either an initial public offering (IPO) of the stock of the venture-backed industrial firms or a merger and acquisition (M&A) deal with an already established corporation. By the 1980s the general partners of a venture-capital firm received, in addition to a 2 percent management fee, a "carried interest" of at least 20 percent of the returns of the particular

[2] The main exception was Arthur Rock, who in 1957 had arranged the startup financing for Fairchild Semiconductor while working at Hayden Stone, a New York City investment bank. By 1961 Rock had relocated to the San Francisco area, where he set up the venture-capital firm, Davis and Rock, with the eight founders of Fairchild as limited partners. In 1968 Rock secured the startup financing for Intel, founded by two Fairchild executives, Gordon Moore and Robert Noyce.

venture-capital fund that they raised, distributing the remainder to the institutions or individuals who, as limited partners, provided the general partners with the capital for the fund.

The innovative capabilities of the companies in which venture capitalists invested created the value from which returns to investors could be made. By the 1970s the microelectronics revolution had resulted in a growing range of business and household product applications, and coming out of the semiconductor revolution, Silicon Valley venture capitalists had become part of the regional institutional environment. What was needed now was an adequate supply of capital for investments in new ventures that could take advantage of the plethora of technological and market opportunities that the microelectronics revolution had opened up. Over the course of the 1970s, a number of changes in US financial institutions encouraged the flow of capital into venture-capital funds, thus favoring the growth of Silicon Valley and NEBM.

The 1971 launch of the National Association of Security Dealers Automated Quotation electronic exchange, better known as NASDAQ, created a highly liquid stock market with much less stringent listing requirements than the New York Stock Exchange (NYSE). It thus became much easier for a young company to do an IPO that would allow venture capitalists to realize relatively quick returns on their private-equity investments. Among important New Economy ICT firms that listed on NASDAQ were Intel (IPO in 1971), Applied Materials (1972), Apple Computer (1980), Microsoft (1986), Sun Microsystems (1986), Oracle (1986), Dell Computer (1988), Cisco Systems (1990), Qualcomm (1991), Sanmina (now Sanmina-SCI) (1993), EchoStar (renamed DISH Network in 2008) (1995), Yahoo! (1996), Amazon.com (1997), and Google (2004).

In 1975 the Securities and Exchange Commission (SEC) barred stock exchanges from charging fixed commissions on stock-trading transactions, ending a practice that had prevailed on Wall Street since 1796. This change made it less costly for stock-market investors to buy and sell shares to realize capital gains as an alternative to holding the shares for the sake of a stream of dividend income, and thus facilitated early IPOs of new ventures that were not yet profitable enough to pay dividends. It also favored the subsequent growth of the firm as a publicly listed company because of the willingness of capital-gains oriented stock-market investors to forego dividends, thus leaving more earnings in the company for internal investment.

In 1978, in response to intensive lobbying led by the American Electronics Association and the NVCA (both of which were dominated by Silicon Valley interests), the US Congress reduced the capital-gains tax rate from a maximum of almost 40 percent to a maximum of 28 percent, thus reversing a 36-year trend toward higher capital-gains taxes. In 1981 the capital-gains tax rate was further reduced to a maximum of 20 percent. Venture capitalists saw lower capital-gains taxes as encouraging both entrepreneurial investment in new companies and portfolio investment by individuals in the publicly traded stocks of young, potentially high-growth firms.

During the 1970s, however, venture capitalists still faced constraints on the amount of money that they could raise for venture funds, mainly because of restrictions on their access to the vast accumulation of household savings held by pension funds. In the early 1970s there was only a trickle of institutional money invested in venture capital, and even that flow dried up when the passage of the Employee Retirement Income Security Act (ERISA) in 1974 made corporations responsible for underfunded pensions and pension-

fund managers personally liable for breaches of their fiduciary duty to use the "prudent man" rule when making investments. Under these circumstances, pension-fund managers, who controlled the allocation of an ever-increasing share of US household savings, avoided investment in venture-capital funds. On July 23, 1979, however, the US Department of Labor decreed that, under ERISA, pension-fund money could be invested not only in listed stocks and high-grade bonds but also in more speculative assets, including new ventures, without transgressing the prudent man rule.

As a result, pension-fund money poured into venture-capital funds. Independent venture partnerships (the type that prevailed in Silicon Valley) increased their access to the capital of pension funds from, measured in 1997 dollars, $69 million in 1978, just 15 percent of all funds raised, to $1,808 million in 1983. Throughout the 1980s and 1990s, pension funds provided anywhere from 31 percent to 59 percent of the funds raised by independent venture-capital partnerships, which in turn increased their share of all venture funds raised from 40 percent in 1980 to 80 percent a decade later (Gompers and Lerner 2002, 8).

Like the reduction in the capital-gains tax rate, the clarification of the prudent man rule under ERISA did not just happen. Both the venture-capital community and the managers of large corporate pension funds lobbied the US government for the relaxation of the strictures of ERISA. For example, in 1998, the National Venture Capital Association gave its first Lifetime Achievement Award to David Morgenthaler, a co-founder of NVCA, for his seminal efforts in leading the NVCA in lobbying for the capital-gains tax reduction as well as for the clarification of ERISA.[3] As another example, in 1994 Janet Hickey, now at Sprout Group, a venture capital affiliate of Credit Suisse, was one of the first inductees into the Private Equity Hall of Fame for her lobbying of the Department of Labor to permit pension funds to invest in venture capital at a time when she was involved in the management of General Electric's pension fund, one of the largest in the United States.[4]

The massive infusion of capital into venture funds from the pension savings of US households underpinned the third wave of entry of Silicon Valley venture-capital firms. These venture capitalists in turn became much more active in funding semiconductor startups as well as those new firms producing the array of electronic products that silicon chips made possible. Semiconductor firms were supplying microprocessors and application specific integrated circuits (ASICs) to a growing range of computer applications, which created a multitude of new opportunities in computer hardware and software that venture capitalists could fund, extending from videogames and disk drives in the early 1980s to e-commerce and optical networking gear in the late 1990s.

Apple Computer's highly successful IPO in December 1980 is generally credited with setting off the startup and IPO boom of the early 1980s. After achieving spectacular returns on its investments, averaging about 35 percent, between 1978 and 1983, the venture-capital industry was punished for over-investing, with returns averaging less than 10 percent in the last half of the 1980s. After 1990 returns moved up once again, soaring to almost 150 percent at the peak of the Internet boom before turning negative in the crash of 2001 and 2002 (Lerner 2002).

---

[3] http://www.morgenthaler.com/about.asp

[4] Cited at http://www.assetnews.com/ped/hall_of_fame/hickey.htm.

The Silicon Valley venture-capital model spread to other parts of the United States, especially during the 1990s, with investments being made in many different locations and a wide range of industries. Measured in 2000 dollars, total venture-capital investment in the United States rose from $9.1 billion in 1995 to $22.3 billion in 1998 before skyrocketing to $55.9 billion in 1999 and $105.0 billion in 2000. After falling to $39.5 billion in 2001, venture-capital investment averaged $21.4 billion per year from 2002 to 2007, including $25.3 billion in 2007. In current dollars, venture-capital investment declined from $30.5 billion in 2007 to $28.3 billion in 2008 (PricewaterhouseCoopers 2009). Silicon Valley remains by far the world's most important location for venture capital.

As indicated above in Table 1, the stock market became much more important as both a direct and indirect source of finance under NEBM than under OEBM. The stock market served as an inducement for venture capital to fund startups. Once a company had gone public, it could use its stock to finance a merger with or acquisition of another company. The use of stock instead of cash as an acquisition currency became much more prevalent in the United States in the late 1990s than it had been during the late 1980s.

No company has made such systematic use of its stock as an acquisition currency as Cisco Systems. Founded in Silicon Valley in 1984, Cisco did its IPO in 1990, a year in which it had $70 million in revenues and 254 employees. Over the course of the 1990s Cisco came to dominate the Internet router market, reaching revenues of $18.9 billion in fiscal 2000, with a year-end total of 34,000 employees. From September 1993 through July 2003, the company did 81 acquisitions for $38.1 billion, 98 percent of which was paid in stock. From November 2003 through May 2009, however, Cisco did another 52 acquisitions for $16 billion, almost entirely in cash, with stock constituting complete payment in only one case ($590 million) and partial payment in another two (that cost $890 million combined).

Why did Cisco reverse its practice of using stock as an acquisition currency? What tilted Cisco toward the use of cash was its massive stock repurchase program that began in 2002 and, as was generally the case in the US corporate economy, escalated over the following years. If Cisco had continued to use its stock to acquire companies, it would have just increased the number of shares it would have wanted to repurchase to support its stock price. Cisco also paid much less on a per-employee basis for its cash acquisitions than it had paid for its stock-based acquisitions, reflecting perhaps a preference in these years by the owners of the acquired firms for cash rather than volatile stock, the price of which had to be supported by stock buybacks.

Organization

i) From OEBM to NEBM at IBM and HP

In the post-World War II decades, career employment with one company became the generally accepted norm in the US economy. The sociological foundation of OEBM was "the organization man". Popularized in the United States in the 1950s (Whyte 1956), the stereotypical organization man was a white, Anglo-Saxon, Protestant male who had obtained a college education right after high school, secured a well-paying job with an established company early in his career, and then worked his way up and around the corporate hierarchy over three or four decades of employment, with a substantial defined-benefit pension, complemented by highly subsidized medical coverage, awaiting him on

retirement. The employment stability offered by an established corporation was highly valued, while interfirm labor mobility was shunned.

Through the 1980s IBM and HP were exemplars of OEBM. In 1985 IBM controlled more than 70 percent of the global mainframe computer market, and it was also the clear-cut global leader in sales in the minicomputer, microcomputer, and computer peripherals markets. At a time when Americans had come to see "permanent employment" as a key institution in the competitive success of Japan, Jack Kuehler, head of IBM's worldwide manufacturing operations, could state: "Our people when they come to this company work for life. They work as an IBM team, for the common goal to be very competitive. A lot of the things you read about Japanese management techniques, IBM has been doing for years" (quoted in Kotkin 1985).

The competitive success and sustained growth of IBM in the postwar decades helped to institutionalize a no-layoff policy. In 1958, with almost 89,000 employees, IBM was the first major company to place all hourly workers on salary. IBM's lifelong employees could expect to be retrained and reassigned to new jobs within the company as its mix of products and processes changed. Even in the last half of the 1980s, when IBM cut its total employment from a record high 405,535 people in 1985 to 373,816 in 1990, all of the reductions came through voluntary retirement schemes.

For 38 years from 1947, HP's year-end employment level rose continuously, reaching 84,000 people in 1985. The company adjusted to declines in employment in 1986, 1990 and 1991 through the offer of early retirement packages and relocations. HP's employment level then grew to 124,600 in 1998, before dropping to 84,400 in 1999 when the company spun off its noncomputer-related businesses as Agilent.

HP was able to sustain a no-layoff policy for more than half a century because, through continuous product innovation, it increased its revenues in every year from 1949 through 2000 (adjusting for the 1999 Agilent divestiture). HP kept people employed by moving them around the organization to activities and locations in which more employees were needed. If a person did not want to move, he or she could get a voluntary severance package amounting to a half month's pay for every year of service with a minimum of four months.

During the 1990s HP remained committed to its no-layoff policy at a time when most US high-tech corporations had embraced "employability" – the notion that, by accumulating capabilities, a person could move from company to company and even from one type of job to another type in a constantly changing labor market. In a 1996 article in *HR Focus*, the human resources newsletter of the American Management Association, Tom Pierson, manager of HR planning, staffing, and relocations at HP's Palo Alto headquarters, was quoted as saying:

> I think [the employability doctrine] is just a rationalization for not being able to provide employment security….We feel very strongly about employment security. We still cherish careers [with the company]….We have a lot of our benefit and employee programs geared around length of service…And we've structured our total compensation package in a way that says: The longer you're here, the better off you are (quoted in McNerney 1996, 6).

By the early 2000s, however, HP's no-layoff policy would be history. A decade earlier IBM has taken the lead among Old Economy ICT companies in ending its system of lifelong employment as part of its deliberate transformation from OEBM to NEBM.

From 1990 to 1994, IBM cut employment from 373,816 to 219,839, reducing its labor force to only 59 percent of its year-end 1990 level. During this period, much of IBM's downsizing continued to be accomplished by making it attractive for its employees to accept voluntary severance packages, including early retirement at age 55. In 1993 and 1994, however, after recruiting CEO Louis V. Gerstner, Jr. from RJR Nabisco to get the job done, many thousands of IBM employees were fired outright.

Of IBM's losses of $15.9 billion in 1991-1993 (including an $8.1 billion deficit in 1993, the largest annual loss in US corporate history at the time), 86 percent came from workforce-related restructuring charges (including the cost of employee separations and relocations) – in effect the cost to the company of ridding itself of its once-hallowed tradition of lifelong employment. Other restructuring charges, mainly for the consolidation of manufacturing capacity and elimination of excess space – both part and parcel of the massive downsizing process – amounted to $10.6 billion over the three years. Ignoring restructuring charges, IBM recorded positive net incomes before taxes of $939 million in 1991, $2,619 million in 1992, and $148 million in 1993. Although IBM continued to downsize at a torrid pace in 1994, most of it was done outside the United States and without voluntary severance provisions. During 1994 the company booked no restructuring charges and had after-tax profits of $3,021 million. By that time, lifelong employment was a thing of the past.

During the 1990s IBM pursued a strategy of shifting its business out of hardware into services. Continuing a trend that began in the late 1980s, the share of revenues from hardware declined from 48 percent in 1996 to 25 percent in 2006, while the services share increased from 29 percent to 53 percent.[5] In December 2004 there was considerable publicity concerning IBM's sale of its PC business to Lenovo, an indigenous Chinese computer company formerly known as Legend. IBM's 2006 gross margins of 37 percent in hardware and 27 percent in services were virtually the same as in 1996. Software's share of revenues increased from 15 percent in 1996 to 20 percent in 2006, however, and the segment's already high gross margin of 74 percent in 1996 rose to 85 percent in 2006.

The company's new emphasis on services and software as well as the vertically specialized structure of the ICT industry that IBM itself had played a major role in creating rendered the use of a mobile and flexible high-tech labor force much more desirable and possible for the company than had been the case in the 1980s. Given the absence of in-house investments in proprietary systems, the technological rationale for Old Economy lifelong employment no longer existed at IBM. The company now favored younger employees whose higher education was up-to-date and who had work experience at other companies within the ICT industries over older employees who had spent their careers with IBM. In 1995 IBM rescinded the early-retirement offer that had helped downsize its labor force; the offer had accomplished its purpose, and in any case, IBM no longer wanted to encourage all employees to remain with the company even until the age of 55.

Unlike IBM, which deliberately and dramatically made the transition to New Economy employment relations in the first half of the 1990s, HP sustained its commitment to employment security through the 1990s. That this commitment lasted as long as it did is testimony to the legacy of "The HP Way", a corporate philosophy whose

[5] As of 2007 IBM changed its segment classification scheme so that one can no longer identify hardware sales.

life at the company was probably prolonged by co-founder David Packard's 1995 publication of the best-selling autobiography with this title.[6] By the mid-2000s, however, HP, with 150,000 employees, had become what Packard would have called a "hire-and-fire" company.

As was the case at IBM, HP's transition to NEBM, including the employment of a more mobile and flexible labor force, was encouraged by the shift from proprietary to open technology standards that had begun to take root in the early 1980s. In the 1980s and 1990s, HP found itself at the center of the microelectronics revolution not only because of its location in Palo Alto, California, where it acquired iconic status as the pioneering Silicon Valley firm, but also because of a business strategy that focused increasingly on consumer-oriented computer products and peripherals.

In building its competitive strategy around open systems, HP acquired a greater interest in employing a labor force with industry-wide experience as distinct from one that had in-house experience in proprietary technology. HP's major Route 128 rivals in the minicomputer industry – Digital Equipment Corporation (DEC), Wang Laboratories, and Data General – all continued to adhere to proprietary systems, and all ceased to exist in the 1990s. In 1984 DEC had $1,527 million in minicomputer sales to HP's $950 million. In the 1990s, however, DEC fell victim to competition from ever more powerful and functional open-systems computers, and in 1998 was acquired by Compaq – a company that, by cloning the IBM PC, had become a global leader in personal computers. What was left of DEC, a company that had a peak employment of 126,000 people, ultimately became a part of HP when HP merged with Compaq in 2002.

The 1999 spinoff of Agilent Technologies, which included the electronic testing and measurement devices business on which HP had been founded, marked the beginning of the end of "The HP Way". A few months after the Agilent spinoff, HP hired a new CEO, Cara Carleton S. Fiorina, an apostle of the New Economy recruited from Lucent Technologies. In the recession of 2001, HP eliminated 10,700 jobs, leaving displaced employees with dim prospects of finding new positions within HP. While HP's management never officially announced the demise of "The HP Way", neither would it henceforth invoke it as the prevailing corporate philosophy.

Then, in September 2001, HP declared its intention to merge with Compaq Computer, the world's second largest PC producer and largest enterprise server producer, with a total of $33.6 billion in sales and 63,700 employees. HP was number four in both product markets with a total of $18.2 billion in sales. Given the downturn in ICT markets in 2001, it was clear that the merger of the two companies would entail a consolidation of operations that would mean a considerable loss of jobs. Indeed, it was the possibility of cost-savings through post-combination consolidation that made the merger financially attractive. HP's estimate for post-merger downsizing was 15,000 jobs.

One year after the merger, employment at HP had declined from 153,500 to 141,400, the net result of 18,900 layoffs and 6,800 new hires. In early 2005 Fiorina was herself ousted from her job – with a $21.1 million severance package – because she, reportedly, "failed to slash costs and boost revenue as quickly as directors had hoped" (Konrad 2005). From the time of the merger with Compaq through 2006, HP laid off 45,000

[6] Packard, who retired as HP's chairman of the board in 1993, died in March 1996. Co-founder William Hewlett, who retired as CEO of HP in 1978 and as vice-chairman of the board in 1987, died in January 2001.

employees, while hiring almost as many new employees. The purpose of this "churn" was to reduce the cost of labor.

ii) The relation between employment security and retirement security

The dramatic transformations in employment relations that took place at Old Economy companies like IBM and HP as they made the transition from OEBM to NEBM were accompanied by fundamental changes in pension provisions. Under OEBM, defined-benefit (DB) pensions that assumed career employment with one company and guaranteed a certain level of retirement income had been the norm. These DB pensions were entirely company-funded, non-portable from one company to another, and "back-loaded" with the largest incremental increases in prospective retirement pay coming during the last years of employment before reaching retirement age.

By the mid-2000s DB plans had been replaced by defined-contribution (DC) plans in the form of 401(k)s; individual, and hence portable, retirement accounts in which the company typically matches the employee's contribution up to a certain maximum, with the amount of income generated for retirement depending on the performance of the types of securities in which the individual chooses to invest. In line with the absence of a company's commitment to, or an employee's expectation of, career employment with one company under NEBM, DC pensions facilitate interfirm labor mobility over the course of one's career. All of the major ICT companies founded from the mid-1970s have had only 401(k) plans.[7] Like employment income, retirement income under NEBM is inherently more uncertain than under OEBM.

After ridding itself of lifelong employment, IBM began replacing its traditional DB pensions with cash-balance (CB) pensions that, while remaining defined-benefit, were portable and could be structured to attract younger employees rather than to retain older employees. With their expected pension benefits reduced, older employees at IBM charged age discrimination, but they ultimately lost their court battles, and also saw their shareholder proposals to revert to the traditional DB plan go down to defeat at every IBM annual general meeting from 2000 through 2007. By 2005 new US hires at IBM were only eligible for a 401(k) plan. In 2006 HP adopted the same policy, and froze pension and medical benefits for existing employees without sufficient seniority.

At most US ICT companies, IBM and HP included, there are no unions to protect economic security for their members in employment and retirement. Even in the 1950s and 1960s, when the US labor movement was strong, ICT companies tended to be non-union. Among the leading ICT companies, only NCR, Xerox, and the companies that evolved out of the old Bell System have histories of significant unionization.

NCR, which as National Cash Register dates back to 1884, was very highly unionized in the late 1960s, with almost 15,000 union members at its Dayton, Ohio plant, where it produced electro-mechanical business machines. In the 1970s, however, NCR ran down its Dayton plant, while it opened new non-union plants in other parts of the United States to produce digital electronic business machines. By the 1980s NCR had become basically a non-union company.

In contrast, Xerox's manufacturing plant in Webster, New York remains unionized. Indeed, in the 1980s and 1990s, through joint-study teams, the union cooperated with

[7] The US law that permits the taxation of compensation placed in a 401(k) account to be deferred until it is withdrawn by the account owner was passed in 1978 and went into effect in 1980.

management in the improvement of production methods that enabled manufacturing jobs to remain at Webster that the company would otherwise have outsourced to low-wage countries. In the 1990s and 2000s, successive collective bargaining contracts provided employment security to existing union members. By the early 2000s, however, the number of union members at Xerox had declined sharply, and joint-study teams were abandoned. From 1990 Xerox employees had been able to choose between a DB or CB plan. From 2005, however, all new hires, union members included, were only eligible for a 401(k).

The largest concentrations of union members in ICT are at the three major service providers that evolved, after a number of combinations, from the breakup of the Bell System in 1984. At the end of 2008 AT&T Inc. had 180,000 union members, about 60 percent of its workforce; Verizon 85,000, about 38 percent of its workforce; and Qwest, 17,000, about 52 percent of its workforce. Represented primarily by the Communications Workers of America (CWA) and the International Brotherhood of Electrical Workers (IBEW) in an industry that remains partially regulated, union members at these companies continue to have a high degree of employment security. They also have defined-benefit retirement plans (including a union-negotiated CB plan at AT&T), in contrast to salaried employees at AT&T and Verizon, who are only eligible for 401(k)s.

The technology equipment company that emerged out of the Bell System was Lucent Technologies, which was spun off from AT&T Corp. in 1996. In September 1999, across its US plants, Lucent employed 46,818 union members representing 40 percent of its US labor force. In September 2006, two months before it was acquired by the French company, Alcatel, Lucent employed only 2,800 union members. Adding in represented workers at Avaya and Agere, two major business units that Lucent divested in the early 2000s, union members were only about 5,600, or 15 percent, of the 38,000 US employees of the three companies combined at the end of September 2006.

iii) Stock-based compensation under NEBM

Employment at a startup is inherently insecure; given the likelihood of failure, it is impossible for a young high-tech firm to hold out the realistic promise of career employment to its personnel. Instead, from the 1960s new ventures in Silicon Valley offered technical and managerial personnel stock options, with exercise prices often at pennies a share, to lure them away from secure employment with established companies. If the startup did an IPO or was sold to an already listed company, these stock options would become very valuable. As a result, *non-executive* stock options became a key mode of compensation under NEBM.

The *executive* stock option had come into widespread use in the 1950s after high-level salaried corporate executives lobbied Congress to allow gains on the exercise of stock options to be subject to the 25 percent capital-gains tax rate rather than personal-income tax rates that reached 91 percent on the highest income brackets in the 1950s. The Revenue Act of 1950 granted this privilege to corporate executives. Over the course of the 1950s, top executives of US corporations saw income from the exercise of stock options become an important component of their total remuneration.

In the 1960s and into the 1970s a backlash of public sentiment against this enrichment of top executives led Congress to place restrictions on the use of stock options as a mode of compensation as well as to increase the capital-gains tax rate. After the Tax Reform

Act of 1976, however, the Silicon Valley lobby swung into action, and, in the name of innovation, convinced Congress to lower both the personal-income and capital-gains rates, as well as to restore the capital-gains treatment and relax the rules on the granting and exercising of stock options, thus resuscitating them.

The 1980s and 1990s witnessed an explosion in executive pay, driven by stock options. Between 1980 and 1994 the mean value of stock-option grants to CEOs of large US corporations rose from $155,037 to $1,213,180, or by 683 percent, while the mean value of their salary and bonus compensation rose from $654,935 to $1,292,290 million, or by 95 percent. As a result, stock options accounted for 19 percent of CEO compensation in 1980 but 48 percent in 1994 (Hall and Leibman 1998, 661). A study of CEO remuneration in S&P 500 companies found that average compensation in 2003 dollars rose from $3.5 million in 1992 to a peak of $14.8 million in 2000, declining to $8.7 million in 2003 (Jensen et al. 2005). The value of stock options accounted for 28 percent of this pay in 1992, 49 percent in 2000, and 38 percent in 2003. Of the change in pay from 1992 to 2000, 10.5 percent came from salaries, 15.4 percent from bonuses, and 56.7 percent from stock options. Of the decline in pay from 2000 to 2003, 14.1 percent came from salaries, 11.2 percent from bonuses, and 65.0 percent from stock options. It has been estimated that, largely as a result of gains from the exercise of stock options, the ratio of the pay of CEOs of major US corporations to that of the average worker increased from 42:1 in 1980 to 107:1 in 1990 to 525:1 in 2000. Notwithstanding the less ebullient stock markets that prevailed in the 2000s, this ratio remained very high at 364:1 in 2006 and 344:1 in 2007 (AFL-CIO 2009).

With good reason, both academics and journalists who are critical of high executive pay have focused most of their attention on the excesses of executive stock options. Yet the vast majority of employee stock options in the United States have been issued to non-executive personnel as part of what became known as “broad-based” programs. The high concentration of startups in Silicon Valley meant that increasingly in the 1980s new ventures not only used stock options to induce high-tech labor to leave secure employment with established corporations, but also competed among themselves for personnel, with an emphasis on stock options in their compensation packages. Besides attracting “talent” and giving them a stake in getting the startup to an IPO, ample stock options could substitute to some extent for cash salaries.

The growing importance of stock options to attract new employees placed pressure on high-tech firms to use options to retain them as well. For this reason, the practice evolved in New Economy firms of making annual option grants, 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 are vested, they can typically be exercised for a period of 10 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, so that the retention function of stock options is integrally related to the employee’s career progress within the particular company.

In their early years, some Silicon Valley startups like Intel, Oracle, Sun Microsystems, and Cisco Systems granted stock options to substantial proportions of

their employees. Many New Economy companies located outside Silicon Valley – for example, Microsoft based in Washington State and Dell based in Texas – did so as well. During the 1980s and 1990s New Economy companies maintained, and in some cases enlarged, their broad-based stock-option programs even as they grew to employ tens of thousands of people.

At the beginning of the 1990s, IBM, like most Old Economy companies, reserved stock options for top executives. In making the transition to NEBM, however, the company increasingly and substantially broadened the base of recipients. HP awarded stock options only to upper-level employees in the early 1980s, but then began to extend stock options to a larger proportion of the labor force from the mid-1980s. At the end of fiscal 2007, the proportion of HP employees holding options was 58 percent, or 99,000 employees.

For NEBM employees, stock options are not only a potential form of remuneration for work but also, hopefully, a source of retirement savings. As already mentioned, almost all New Economy companies have DC rather than DB pension plans, often with a low level of contribution by the company. The expectation has been that the accumulation of wealth through the exercise of stock options will form a much more significant financial foundation for retirement than the 401(k) savings plan.

During the Internet boom, income from broad-based stock options soared with speculative stock prices, especially in those high-tech regions in which employee options were in most widespread use. For example, from 1996 to 2000, average real wages (in 2000 dollars) in semiconductor employment in Silicon Valley almost doubled from $79,600 to $156,300. Even more dramatically, average real wages of software publishing employees in Washington State more than tripled from $112,600 in 1996 (already almost double 1994 real wages) to $380,038 in 2000. The reason: At the peak of the Internet boom, employees at companies such as Intel and Microsoft were cashing in on stock options at inflated stock market prices. In computer programming as well as computer system design employment, Silicon Valley wages were also higher than in other districts, and average real wages also moved up sharply in the boom.

In their proxy statements, companies provide data on the gains from the exercise of stock options of the CEO and four other highest paid executives (the “top-5”). Table 2 shows the average annual income per top-5 executive from the exercise of stock options from 1995 to 2008 at 12 major ICT companies. In addition to the information on top-5 compensation, the notes to company 10-K financial statements provide data that permit an estimate of the average gains per company employee (including those who may not have received options) from the exercise of stock options. Table 3 shows estimates of the average gains per employee (excluding the top-5) from exercising options for the same 12 companies listed in Table 2. Especially at Cisco, Dell, Intel, Microsoft, Oracle, and Sun, all of which awarded options to virtually all of their employees in the second half of the 1990s, employees made very significant average gains from the exercise of stock options at the peak of the Internet boom.

Table 2: Average Gains (thousand US dollars) per Top-5 Executive from the Exercise of Stock Options, Selected US ICT Companies, 1995-2008

	AMD	CSCO	DELL	HPQ	INTC	IBM
1995	546	4,065	387	534	4,892	152
1996	2,011	15,790	820	1,074	24,585	5,383
1997	4,549	3,124	1,977	2,161	12,516	3,764
1998	190	5,972	14,417	1,114	40,137	10,239
1999	139	60,586	36,937	8,732	4,796	24,457
2000	20,080	51,302	98,791	4,360	32,063	13,293
2001	3,517	11,884	75,151	0	4,117	29,296
2002	16	805	28,612	127	3,514	943
2003	81	1,291	2,103	502	6,298	2,139
2004	115	14,207	14,019	182	6,338	2,876
2005	1,649	15,804	9,364	2,319	4,208	3,550
2006	4,746	17,614	31,466	4,903	2,929	3,210
2007	1	22,517	6,692	8,837	4,339	2,454
2008	0	3,918	0	2,341	59	4,091

	LU	MSFT	MOT	ORCL	JAVA	TXN
1995		2,505	3,190	4,301	727	4,066
1996	na	0	1,038	8,302	2,786	0
1997	248	4,127	180	3,620	4,425	1,265
1998	15,597	3,271	0	3,752	11,515	1,492
1999	165	30,178	2,297	6,754	5,619	5,037
2000	6,100	50,653	607	83,504	25,180	15,048
2001	0	31,531	546	169,674	18,441	992
2002	1	1,405	114	0	5,406	0
2003	0	6,870	0	13,001	1,323	9,178
2004	0	8,564	808	8,633	1,432	493
2005	183	5	2,913	21,953	2,397	2,220
2006	na	0	8,178	12,998	564	7,286
2007		0	554	46,865	666	1,302
2008		0	0	126,278	48	4

NOTES:

1) Stock ticker abbreviations: AMD, Advanced Micro Devices; CSCO, Cisco Systems; DELL, Dell; HPQ, Hewlett-Packard; INTC, Intel; IBM, International Business Machines; LU, Lucent Technologies; MSFT, Microsoft; MOT, Motorola; ORCL, Oracle; JAVA, Sun Microsystems; TXN, Texas Instruments.
2) na, not available.

SOURCE: Company proxy statements

Table 3: Average Gains (US dollars) per Employee (excluding the top-5) from the Exercise of Stock Options, Selected ICT Companies, 1995-2008

	AMD	CSCO	DELL	HPQ	INTC	IBM
1995	1,086	60,894	3,833	2,362	18,746	671
1996	1,490	93,399	7,194	2,213	16,010	1,823
1997	5,075	85,159	11,219	3,156	25,295	3,615
1998	1,435	92,947	40,547	2,676	75,890	4,066
1999	1,687	193,476	126,639	6,613	56,589	5,790
2000	20,113	290,870	84,818	17,987	112,018	4,200
2001	2,115	105,865	76,122	1,498	18,235	4,011
2002	537	13596	33,167	838	10,413	1,195
2003	1,163	8,917	10,739	936	10,406	1,553
2004	5,103	32,804	12,216	638	8,405	1,842
2005	12,786	24,432	11,297	1,739	8,347	1,256
2006	18,197	25,487	8,724	6,809	3,396	1,857
2007	1,149	73,004	221	9,982	6,915	3,524
2008	11	12,533	223	2985	1,471	2,073

	LU	MSFT	MOT	ORCL	JAVA	TXN
1995		51,829	na	na	2,468	2,136
1996	na	79,022	471	7,367	7,992	892
1997	1,019	154,196	1,058	6,588	7,626	2,932
1998	5,449	238,377	361	5,019	10,799	4,473
1999	7,505	369,693	4,055	5,650	27,477	47,880
2000	23,281	449,142	3,218	37,214	60,431	22,881
2001	828	143,772	415	88,723	46,763	6,767
2002	955	95,310	334	6,950	4,550	4,650
2003	11	80,283	42	6,193	1,182	4,803
2004	486	50,690	1,381	7,908	1,960	6,144
2005	615	14,500	8,688	6,926	1,187	12,512
2006	558	6,208	7,804	9,514	1,249	11,142
2007		14,991	2,695	14,927	2,740	19,209
2008		7,766	139	9,453	1,996	2,921

NOTES:

1) See Table 2 for company stock ticker abbreviations.
2) Since 1995 companies have reported the number of options exercised in any given year and the weighted average exercise price (WAEP) of the options exercised. To generate estimates of employee gains from the exercise of options, I assume that employees exercise options evenly over the course of the fiscal year in all months in which the highest market price of the stock is greater than WAEP for the year. I then use the difference between the mean market price and WAEP during each such month to derive the gains over the course of the fiscal year.
3) na, not available.

SOURCE: Company 10-K filings

Since the downturn of 2001-2002, these gains have returned to "normal", although, as in the case of the average gains of $73,000 at Cisco in 2007, in certain years at certain companies they can still be extraordinarily high.[8] More generally, during the 2000s a new reality for US high-tech workers has set in that includes lower levels of high-tech employment and much diminished stock-option compensation compared with the Internet boom of the late 1990s. In the 2000s, moreover, NEBM's flexible employment relations have left members of the US high-tech labor force vulnerable to the cost-cutting and offshoring strategies of companies that are driven by what I call "the quest for shareholder value".

iv) The bias toward younger employees under NEBM

It was inherent in the transition from OEBM to NEBM in the 1990s that older members of the ICT labor force faced much greater insecurity than they had in the past. The adoption of open systems in place of proprietary systems – a key characteristic of the transition from OEBM to NEBM – reduced the value of the accumulated experience with one company that older workers possessed. Moreover, career employment with one company typically meant that one's salary rose with the length of tenure while the accrual of the value of traditional DB pensions was much greater toward the end of one's career. Unleashed from a commitment to career employment, companies had an incentive to terminate older employees and substitute lower-wage workers in their stead.

Given its size, reputation, and central position in the ICT industries, IBM's transformation from OEBM to NEBM in the early 1990s marked a fundamental juncture in the transition from employment security to employment insecurity in the US corporate economy. This dramatic change in IBM's employment relations was at the expense of older workers. For example, in 1994 about 3,500 IBM employees filed a class action lawsuit against the US Internal Revenue Service, claiming that IBM should not have withheld taxes on their severance pay since these awards represented a legal settlement obtained in return for signing an agreement in which they waived their right to sue IBM for age discrimination.

A study of "turbulence" in employment from the early 1990s to the early 2000s found that the most common career path in semiconductors was the "job switcher" who worked for two different companies, and the most common career path in software was the "job hopper" who worked for more than two companies (Brown et al 2006, 84-86). For personnel at all levels of education in these industries, workers who changed jobs more earned less. Based on intensive research on the US semiconductor industry, Clair Brown and Greg Linden (2008, 22) concluded that "[t]he labor market situation is especially difficult for older engineers, who face rapid skill obsolescence….When companies claim they face a shortage of engineers, they usually mean that they face a shortage of young, relatively inexpensive engineers with the latest skills, even when they have a queue of experienced engineers who want retraining."

Statistical studies of large-scale datasets for the US labor force more generally confirm the vulnerability of the job tenure of older workers in the 1990s and 2000s. One study of firm-level data for the period of 1992 to 1997 found a general shift in US employment from older experienced workers to younger skilled workers related to the

[8] In fiscal 2007, Cisco's stock price averaged $25.56 compared with an average of $14.07 in fiscal 2003, the lowest annual average in the 2000s.

adoption of computer technologies (Abowd et al. 2007). A study of the 1980s and 1990s using Current Population Survey (CPS) data revealed that in the 1990s middle-aged and older men were not staying as long with their employers as in the 1980s, and went on to show that the job displacement rate for white-collar workers relative to blue-collar workers rose substantially in the 1980s and 1990s, starting at 33 percent in 1981-1982 and increasing to about 80 percent in the 1990s (Schultze 1999).

In a recent survey of changes in job security, Henry Farber (2008, 1) stated that "[t]here is ample evidence that long-term employment [with one company] is on the decline in the United States." Using CPS data for 1973–2006, he showed that in the 1990s and 2000s members of the US labor force experienced shortened job tenure, with the impact being most pronounced for males. Moreover, education and experience are no longer the guarantors of employment security that they once were. Using Displaced Worker Survey data to analyze rates of job loss, Farber (2008, 35) found that those with college educations had job loss rates 22 percent lower than those with high-school educations in the 1980s, but only 12 percent lower in the 2000s. He also found that workers aged 45-54 had job-loss rates 19 percent higher than workers aged 20-24 in the 1980s, whereas the job-loss rates of the older age group were 58 percent higher than those of the younger age group in the 2000s.

In ICT, companies prefer younger workers not only because they tend to cost less than older workers but also because they are generally more willing to work longer hours, thus effectively reducing their hourly pay rates. Labor productivity depends on effort as well as skill, and tight labor markets reduce the power of employers to demand that their employees deliver high levels of work effort. The key labor issue for ICT employers operating in the United States is not the level of remuneration per se but lack of control over the work effort of a highly mobile labor force. Well aware that changes in corporate strategy could bring a career within a particular company to an end, and supported by a labor market that encourages interfirm mobility, employees at these companies are on the lookout for employment opportunities with other companies that might be beneficial to their personal careers. All other things equal, the larger the available high-tech labor supply, the more dependent the high-tech worker on employment with his or her current company, and the greater the power of the employer to demand that the employee work long and hard.

Hence the interest of high-tech employers in the United States in unlimited H-1B visas for nonimmigrant high-tech workers. Besides increasing the labor supply, the holders of H-1B visas are much more dependent on their current employer for continuing employment in the United States. Moreover, they also tend to be much younger than citizen or immigrant members of the US ICT labor force. The combination of youth and dependence makes H-1B personnel able and willing to work long and hard.

Moreover, these up-and-coming H-1B visa holders are ideal recruits for a company operating in the United States that may want its employees to pursue global career paths as it decides to offshore higher value-added activities. With years of experience in the United States, still young former H-1B holders from places like China and India can be very valuable to a company as, through the company's offshored operations, they follow their global career paths back to the countries from whence they came. The substitution of younger for older personnel for the purpose of cost reduction and not for the purpose

of skill acquisition is particularly likely when the change in the age-composition of employment is achieved through offshoring to lower wage regions of the world.

Globalization of the High-Tech Labor Force

Offshoring to Asia

In the first half of the 2000s Americans became aware of the globalization of the high-tech labor force. "Offshoring" entered the lexicon as US-based companies engaged in a large-scale movement of jobs overseas, with India and China as prime locations. Offshoring is, however, not a new phenomenon. For decades US ICT companies have been routinely offshoring production activities, initially through foreign direct investment (FDI), but increasingly over the past two decades by outsourcing both production and clerical work to other offshore firms. Previously the search for low-wage labor to perform relatively low-skill work drove offshoring, but now it is a search for low-wage labor to perform relatively high-skill work. In the 2000s US ICT companies have been able to access an abundance of such labor in developing countries, and especially in India and China.

Many of the engineering and programming jobs offshored in the 2000s are ones that observers of US high-tech industry thought could not be done abroad. The development of sophisticated products and processes generally requires interactive learning that is both collective and cumulative. Workers engaged in interactive learning have to be in close communication with one another. With the United States at the center of the ICT revolution, the assumption was that these jobs could not be relocated to a low-wage developing economy.

Indeed, precisely because the United States dominates ICT, it is the place to which people come from around the world for ICT-related higher education and work experience. Why would many of the best ICT jobs be migrating to India and China if Indian and Chinese people are migrating to the United States to study and work in ICT? The short answer is that the West-East flow of high-tech jobs seeking educated labor and the East-West flow of educated labor seeking high-tech jobs are highly complementary in the process of upgrading the capabilities of the global ICT labor force. By the mid-2000s, that process had reached a point at which Intel CEO Craig Barrett could proclaim, without too much hyperbole, that people in China "are capable of doing any engineering job, any software job, and managerial job that people in the US are capable of doing" (quoted in Heim 2004), and that "[c]ompanies like Intel can do perfectly well in the global marketplace without hiring a single US employee" (Barrett 2006).

The globalization of the high-tech labor force in the microelectronics industry began in the 1960s when semiconductor companies in the United States set up offshore assembly facilities in Asia. Fairchild Semiconductor was the first company to make this move when it launched an assembly plant in Hong Kong in 1963. By 1971 a United Nations research report could state: "Every established United States semiconductor firm appears to be engaged in some offshore assembly without exception" (Chang 1971, 17). The report listed 33 offshore facilities started during 1963-1971 by 22 different US semiconductor companies, of which eight, with 16 offshore plants among them, were based in Silicon Valley.

At the beginning of the 1970s Mexico was still the most important offshore location for chip assembly. But with Asian wages much lower than Mexican wages, and with

transportation costs of semiconductor wafers and assembled chips small relative to their value, a number of Asian nations outcompeted Mexico as offshoring sites for chip assembly during the 1970s. From 1972 Malaysia became the favored location, with HP and Intel being among the first to open assembly plants in the new Free Trade Zone in Penang. By 1983 Malaysia had 31 percent of the value of semiconductor exports back to the United States, followed by the Philippines with 18 percent, South Korea with 14 percent, and Singapore with 11 percent (Flamm 1985).

The nations to which semiconductor assembly gravitated did not have the lowest wages in the world or even in Asia, but they had good mass schooling systems and relatively stable labor relations, and they welcomed foreign direct investment. India, for example, was not chosen as an offshoring site for chip assembly. In addition, US multinationals went to places where they could hire indigenous college-educated managers and engineers to run the semiconductor plants. In doing so, these companies created some of the first high-tech employment opportunities in nations in which over the ensuing decades the ICT sector would be central to rapid economic growth.

Meanwhile, however, having made major investments to provide nationals with college educations, nations such as South Korea and Taiwan found that large proportions of their best science and engineering graduates were going abroad for post-graduate education and/or work. From the late 1960s an integral objective of their national development strategies was to reverse this "brain drain". Besides encouraging FDI, their governments established and supported science and technology research institutes that could absorb advanced technology transferred from abroad, in part through the repatriation of scientists and engineers who had accumulated education and experience in the United States.

Increasingly, as a result, talented college graduates could remain in South Korea or Taiwan to obtain higher degrees and embark on their careers. They found jobs, moreover, not only with the national subsidiaries of multinational corporations and at government-funded research institutes but also with indigenous companies such as Korea's Samsung Electronics and the Taiwan Semiconductor Manufacturing Company. Building on the capabilities developed by multinational companies and national institutes, a number of these indigenous companies emerged as world-class competitors. In the process the national economies in which these companies were based transformed themselves from relatively poverty to relatively affluence.

US Temporary Work Visas

During the 1980s a growing number of Asian high-tech workers had entered the United States on temporary H-1 visas. This nonimmigrant visa category was created in 1952 to permit people of "distinguished merit and ability" to work in the United States for several years at a time. In 1989 a special category of H-1 visa – the H-1A – was created to deal with a shortage of nurses. All others who worked in the United States under the H-1 program henceforth were categorized as H-1B.

At the time, there was no specific cap on the number of H-1 visas that could be issued, and it reached 49,000 per year in the late 1980s. Labor interests then sought to have the H-1B capped at 25,000 visas per year, but, arguing that US competitiveness was at stake, the high-tech business lobby, supported by the immigration lawyers lobby, secured a very different outcome. The Immigration Act of 1990 set the cap at 65,000. The

American Competitiveness and Workforce Improvement Act raised the cap to 115,000 for fiscal years 1999 and 2000, and the American Competitiveness for the 21st Century Act of 2000 raised it to 195,000 for fiscal years 2001 through 2003. As of October 1, 2003 the annual cap of 65,000 was restored, but with an extra 20,000 visas available to foreign-born professionals who have an advanced degree from a US institution of higher education.

The H-1B visa is a prime way by which college graduates from abroad get work experience in the United States. According to data released in the early 2000s, 98 percent of those admitted under the program had at least a bachelor's degree and 48 percent at least a master's degree, while 39 percent had qualifications in computer-related fields. The average age of H-1B workers admitted in 2003 was 32, with 65 percent between the ages of 25 and 34 (US Department of Homeland Security 2002-2004). Companies apply for the visas, and then can hire the temporary immigrants for an initial period of up to three years, with a renewal for another three years. The employer may opt to sponsor the H-1B employee to become a permanent resident of the United States, and the employee can remain with the company until the permanent residency process is completed.

Indians dominate the H-1B visas. Over the decade 1999-2008, Indians received 46.2 percent of the H-1B visas issued, followed by the Chinese with 6.0 percent and the British with 5.6 percent. In 2008 Indians accounted for 55.7 percent of the visas, Chinese 7.0 percent, and Filipinos 3.1 percent (US Department of State 1997-2008).

Indians have also come to dominate as recipients of L-1 visas, which permit a company to bring a foreign employee who has worked for the company for at least one year to the United States for a period of five to seven years. There is no cap on the number of L-1 visas granted; the number issued rose from 36,589 in 1997 to 54,963 in 2000 to 84,532 in 2007 and 84,078 in 2008. In 1997 Japanese received 19.5 percent of the L-1 visas, British 16.0 percent, Chinese 8.3 percent, Germans 6.7 percent, Mexicans 6.4 percent, and Indians 4.4 percent. By 2000, however, Indians had become the leading group with 16.9 percent, followed by the British with 15.6 percent and the Japanese with 13.0 percent. The Indian proportion of the total kept rising to 48.5 percent in 2007. In 2008 Indians received 40,139 L-1 visas, or 47.7 percent of the total, followed by the British with 7.5 percent and the Japanese with 6.4 percent. The Chinese were in 7th place with 2.8 percent (US Department of State 1997-2008). In 1997 Indians were the beneficiaries of only 1,628 L-1 visas; in 2007, 41,001. Many of the largest corporate users of H-1B and L-1 visas are Indian IT services companies such as TCS, Infosys, Wipro, and Satyam doing business in the United States.

There has been considerable debate concerning the impact of the H-1B visa program on the employment opportunities available to permanent members of the US labor force (see Wikipedia 2009). Companies often hire H-1B workers instead of members of the US labor force with the same skills; indeed, there are many stories of US workers who are about to be laid off who have to train workers on H-1B visas to be their replacements. Companies are supposed to pay H-1B workers the same wages and benefits as comparable US workers, but compliance has not been enforced. Besides increasing the labor supply, the holders of H-1B visas are, as has already been mentioned, highly dependent on their current employer for continuing employment that will allow them to remain in the United States.

Worldwide Employment Trends of Major ICT Companies

The employment of nonimmigrant workers in the United States and the offshoring of work to low-wage areas of the world complement each other in the globalization of the high-tech labor force. In the debate over the cap on H-1B visas, many employers say that if they cannot find qualified workers in the United States, they will go abroad to find these employees. In the 2000s the offshoring alternative is not an empty threat.

Most US ICT companies provide little if any information on the global composition of their workforces. In their global citizenship/responsibility reports, however, a few companies, most notably IBM, HP, and Intel as shown in Table 4, have published data on the diversity (gender, race, and ethnicity) of their US labor forces, from which (with the exception of HP's most recent report) it is possible to track the relative proportions of employees located in the United States and abroad.

After downsizing from 374,000 employees in 1990 to 220,000 in 1994, IBM increased worldwide employment (WWE) to 316,000 in 2000, the final year of the Internet boom. During this period IBM increased US employment (USE) by almost 28,000, but USE as a proportion of WWE fell from 52 percent to 49 percent. From 2000 to 2008 IBM employment outside the United States rose by 116,000 people while USE fell by 33,000. In 2005-2008, IBM had an increase in employment outside the United States of 83,000 people, while the decrease in USE was 14,000, with the share of USE of WWE total dropping from 41 percent to 30 percent. In 2007 98,000, or 25 percent, of IBM's worldwide employees were in Brazil, Russia, India, and China (BRIC), with 74,000, or 19 percent, of all IBM employees, in India alone (IBM 2007, 50). In 2008 BRIC employees increased to 113,000, or 28 percent, of IBM employees worldwide (IBM 2008, 53).

In 2008 IBM was highly profitable, with net income of $12.3 billion (up 18 percent from 2007) on revenues of $103.6 billion (up 5 percent from 2007). The company was particularly profitable in the fourth quarter of 2008 (ending December 31), with net income of $4.4 billion on revenues of $27.0 billion. Yet in January 2009, as part of a process of the transfer of jobs to lower wage countries, IBM terminated the employment of about 4,600 people in the United States and Canada.

At the beginning of February IBM presented these displaced workers with "Project Match". As described in an internal document, the purpose of Project Match is to "help you locate potential job opportunities in growth markets where your skills are in demand." The document goes on to say: "Should you accept a position in one of these countries, IBM offers financial assistance to offset moving costs, provides immigration support, such as visa assistance, and other support to help ease the transition of an international move." Eligible for Project Match are "satisfactory performers who have been notified of separation from IBM U.S. or Canada and are willing to work on local terms and conditions" (quoted in McDougall 2009). That is, an eligible laid-off worker could apply to IBM for a job in, for example, India, and, if rehired by IBM, would be paid the wages prevailing there.

Table 4: Worldwide Employees and US Employees, IBM (1996-2008), HP (2002-2007), and Intel (2001-2008)

	IBM			HP			INTEL		
	WWE	**USE**	**% USE**	**WWE**	**USE**	**% USE**	**WWE**	**USE**	**% USE**
1996	240,615	125,618	52	112,000	na	na	48,500	na	na
1997	269,465	136,487	51	121,900	na	na	63,700	na	na
1998	291,067	147,491	51	124,600	na	na	64,500	na	na
1999	307,401	150,600	49	84,400	na	na	70,200	na	na
2000	316,303	153,587	49	88,500	na	na	86,100	na	na
2001	319,876	152,195	48	86,200	na	na	83,400	54,219	65
2002	315,889	145,705	46	141,000	67,350	48	78,700	50,036	64
2003	319,273	141,022	44	142,000	63,708	45	79,379	48,181	61
2004	329,001	139,899	43	151,000	64,038	42	84,629	48,655	58
2005	329,373	133,967	41	150,000	60,374	40	98,020	53,961	55
2006	355,766	133,973 (127,000)	38 (36)	156,000	54,085	35	92,573	50,348	54
2007	386,558	126,804 (121,000)	33 (31)	172,000	53,519	31	85,187	46,186	54
2008	398,445	120,227 (115,000)	30 (29)	321,000	na	na	83,580	44,755	54

NOTES:

1) WWE, worldwide employees; USE, US employees; %USE, US employees as a percent of worldwide employees (note that WWE and USE data were not necessarily collected on the same dates for any given year).
2) For IBM, USE data for 1996-2008 are from its annual diversity reports, except for the 2006, 2007, and 2008 data in parentheses, which are year-end employment levels taken from the company's annual reports, thus suggesting that the diversity data are not year-end figures.
3) na, not available

SOURCES: Company 10-K filings; IBM diversity data at http://www-03.ibm.com/employment/us/diverse/employment_data.shtml; HP, *Global Citizenship Reports*, 2002-2008; Intel, *Corporate Responsibility Reports*, 2001-2008.

In late March 2009 IBM announced a further 5,000 layoffs in the United States and Canada (Robertson 2009). At about the same time it was revealed that IBM had filed a patent application with the US Patent Office for a "method and system for strategic global resource sourcing" that it had developed. The submission stated: "An important challenge in shifting to globally integrated enterprises is planning the location and capacity of the global workforce." The patent application went on: "This invention allows decision makers to quantitatively explore trade-offs between one or more qualitative factors, or between qualitative and quantitative factors. Therefore, this invention provides a more effective method for making resource sourcing decisions." When confronted by the coincidence of the mass layoffs and the offshoring patent application, an IBM spokesperson said that the latter had been filed in error, and would be withdrawn (localtechwire.com, 2009). In April a story in *The Observer* reported that, as part of IBM's offshoring strategy, similar layoffs could be expected in Britain, Germany, and Ireland (Doran 2009).

The available data on USE as a proportion of WWE for HP begin in 2002, subsequent to its merger with Compaq. USE declined from 48 percent in 2002 to 31 percent in 2007. In its 2008 *Global Citizenship Report*, in contrast to previous years, HP declined to provide data from which one could derive a figure for USE as a percent of WWE. HP's employment strategy has included substantial offshoring of production to China. Toward the end of 2006, HP employed 5,000 people in China, up from 3,000 in 2003. In October 2008, HP announced plans to build a plant in Chongqing to manufacture PCs for the Chinese market. The company also planned to launch its third Chinese call center in Chongqing, to go along with existing centers in Shanghai and Dalian. Since 2004 HP also has been building a major R&D center in Dalian.

HP set up its first Indian research lab in 2002, and employed 2,200 people in India just before its merger with Compaq. At the end of 2003, after making an Indian affiliate, Digital Globalsoft, a wholly-owned subsidiary, HP found itself with more than 10,000 employees in India, making it the nation's largest foreign employer, temporarily surpassing IBM. By the end of 2006 HP had doubled that Indian employment to about 20,000 employees, or about 13 percent of its global labor force. In May 2008 HP announced the acquisition of EDS, which included its Bangalore-based subsidiary, MphasiS, with 28,000 employees in India. The EDS acquisition was followed with the inevitable integration layoffs. In September 2008 HP announced that it would cut 24,600 jobs worldwide – 7.7 percent of the HP/EDS global labor force – with about half of the workforce reductions in the United States. By the beginning of 2009 HP's Indian headcount was around 60,000.

Intel reduced USE as a proportion of WWE from 65 percent in 2001 to 54 percent in 2008, representing a net decline of about 9,500 employees in the United States. Of Intel's 83,580 WWE in 2008, the largest foreign concentration – 11.7 percent of the total – was in Malaysia, where Intel had set up its first offshore assembly plant in 1972. Intel's next largest employment location was in China, with 8.5 percent of Intel WWE (up from 2.9 percent in 2003), followed by Israel with 6.2 percent, Ireland 4.2 percent, Costa Rica 3.5 percent, the Philippines 3.3 percent, and India 2.9 percent (up from 1.9 percent in 2003).

What are the implications of these global employment strategies of major US ICT companies for the future of high-tech employment in the United States? In 2003, when offshoring had become a hot news topic, *Business Week* published a debate between two

of its economics editors about the impact of "outsourcing"[9] on ICT employment in the United States. The key question: As workers from India and China move up the value-added ladder, will even better jobs be created in the United States?

Kathleen Madigan took the pessimistic view, highlighting her position with the statement: "*This is no longer about a few low-wage or manufacturing jobs. Now, one out of three jobs is at risk.*" As she went on: "Optimists argue that the U.S. will keep its innovation lead because it has invented new products before. But that underestimates the risk of being overtaken as skill and education levels rise elsewhere. Unless we focus on maintaining a better-educated workforce, that risk will only rise."

Her colleague, Michael Mandel, took the optimistic view: "*America's strongest suit is innovation, which will always create new high-paying positions.*" Yet Mandel recognized that the generation of new high-tech opportunities for the US labor force was not automatic. "The biggest danger to U.S. workers isn't overseas competition. It's that we worry too much about other countries climbing up the ladder and not enough about finding the next higher rung for ourselves." The evidence on high-tech employment in the United States in the 2000s strongly suggests that "we" – or more precisely, the top executives of major US high-tech companies – have not been worrying enough about putting that "higher rung" in place. Rather, they have been worrying about their companies' stock prices and their own remuneration.

The Quest for Shareholder Value

The Buyback Phenomenon

Apart from the current financial crisis, why have major US ICT companies not been creating more new jobs for educated and experienced members of the US labor force during the 2000s? The answer is clear. Driven by the overwhelmingly dominant ideology that the purpose of a publicly listed company is to "maximize shareholder value", these companies have been allocating massive amounts of resources to shareholders in the forms of not only dividend payments but also repurchases of their own stock (Lazonick 2009a and 2009b, ch. 6).

The two forms of distributing corporate cash to shareholders differ fundamentally in terms of the relation of the shareholder to the company. Dividend payments provide a return to shareholders who continue to *hold* stock in the company. Stock repurchases provide a return to shareholders who *sell* their stock in the company. Stock repurchases, therefore, contribute to the volatility of stock prices.

Stock repurchase programs represent attempts to manipulate stock prices. These programs are orchestrated by the top executives of these companies whose own stock-based compensation, typically in the form of stock options, depends on stock-price increases. High stock-price yields and high levels of executive stock-based compensation, therefore, go hand in hand.

During the decade of the 1970s, the stock market had languished, and inflation had eroded dividend yields. In the 1980s and 1990s, however, as shown in Table 5, high real stock yields characterized the US corporate economy. These high yields came mainly from stock-price appreciation as distinct from dividends yields, which were low in the 1990s despite high dividend payout ratios.

[9] The correct term in this context is "offshoring", since not all work that is offshored is outsourced, and not all work that is outsourced is offshored.

US corporations were not skimping on dividends in the 1980s and 1990s. It is simply that when a company's stock price increases, its dividend yield – the amount of dividends paid out as a percentage of the stock price – will fall unless the amount of dividends increases at least proportionately. In the 1980s dividends paid out by US corporations increased by an annual average of 10.8 percent while after-tax corporate profits increased by an annual average of 8.7 percent. In the 1990s these figures were 8.0 percent for dividends (including an absolute decline in dividends of 4.0 percent in 1999, the first decline since 1975) and 8.1 percent for profits. The dividend payout ratio – the amount of dividends as a proportion of after-tax corporate profits (with inventory evaluation and capital consumption adjustments) – averaged 48.4 percent in the 1980s and 56.5 percent in the 1990s compared with 38.8 percent in the 1960s and 41.3 percent in the 1970s. From 2000 to 2007, the dividend payout ratio was 60.5 percent, including a then record 66.2 percent in 2007. During the first three quarters of 2008, the payout ratio shot up even higher to 73.3 percent (US Congress 2009, Table B-90).

Table 5: Average Annual US Corporate Stock and Bond Yields (percent), 1960-2007

	1960-1969	1970-1979	1980-1989	1990-1999	2000-2007
Real stock yield	**6.63**	**-1.66**	**11.67**	**15.01**	**0.96**
Price yield	5.80	1.35	12.91	15.54	2.09
Dividend yield	3.19	4.08	4.32	2.47	1.64
Change in CPI	2.36	7.09	5.55	3.00	2.78
Real bond yield	**2.65**	**1.14**	**5.79**	**4.72**	**3.34**

NOTE: Stock yields are for Standard and Poor's composite index of 500 US corporate stocks. Bond yields are for Moody's Aaa-rated US corporate bonds.

SOURCE: Updated from Lazonick and O'Sullivan 2000, 27, using US Congress 2009, Tables B-62, B-73, B-95, B-96.

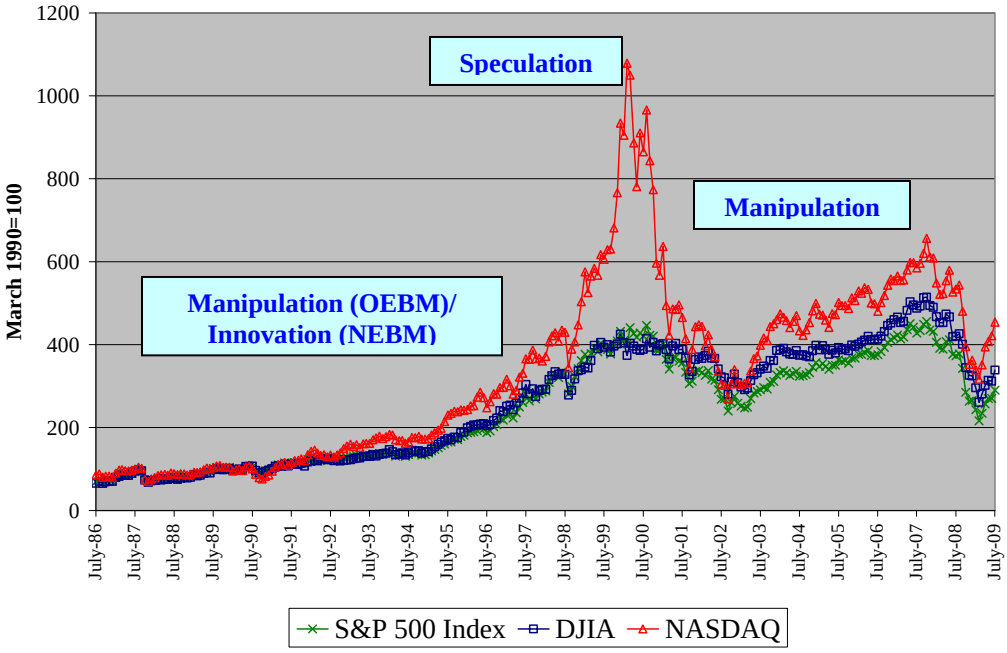
High stock yields reflected a combination of three distinct forces at work in the US corporate economy: 1) *manipulation* of the distribution of income in favor of shareholders, especially by older corporations, through a combination of downsizing of the labor force and increased distributions to shareholders in the forms of cash dividends and stock repurchases; 2) *innovation*, especially by newer technology companies, that, as a result of generating higher-quality, lower-cost products, boosted earnings per share; and 3) *speculation* by stock market investors, encouraged, initially at least, by stock-price increases due to the combination of manipulation and innovation.

In the late 1990s the US stock market became highly speculative as the public discovered the existence of innovative New Economy firms, and then began making bets on many dot.com startups that had little in the way of innovative capability. The extent of the speculative bubble is displayed in Figure 1. The rise and fall of the NASDAQ Composite Index between 1998 and 2001 make the movements of the Dow Jones Industrial Average (DJIA), which at the time included Intel and Microsoft as the NASDAQ representatives among its 30 stocks, and the S&P 500 Index look like mere blips. Between March 1998 and March 2000, the NASDAQ Composite Index of over 3,000 stocks rose by 149 percent compared with 21 percent for the DJIA and 36 percent for the S&P 500.

Figure 1 charts the roles of manipulation, innovation, and speculation as *primary* drivers of US stock-price movements from the mid-1980s to the late 2000s. In the last

half of the 1980s Old Economy companies sought to manipulate stock prices through a "downsize-and-distribute" resource-allocation strategy. This redistribution of corporate revenues from labor incomes to capital incomes often occurred through debt-financed hostile takeovers, with post-takeover downsizing enabling the servicing and retirement of the massive debt that a company had taken on. From the mid-1980s, many Old Economy companies also engaged for the first time in large-scale stock repurchases in an attempt to boost their stock prices.

Figure 1: DJIA, S&P 500, and NASDAQ Composite Indices, July 1986-July 2009 (Monthly Data, standardized for all three indices to 100 in March 1990)



NOTE: As of August 2009, the Dow Jones Industrial Average (DJIA) consisted of 30 stocks, of which 27 were listed on the New York Stock Exchange (NYSE) and 3 on NASDAQ; the S&P 500 Index consisted of 500 stocks, of which 410 were NYSE and 90 NASDAQ; and the NASDAQ Composite Index consisted of 2,809 stocks.

SOURCE: Yahoo! Finance at http://finance.yahoo.com/, Historical Prices, Monthly Data.

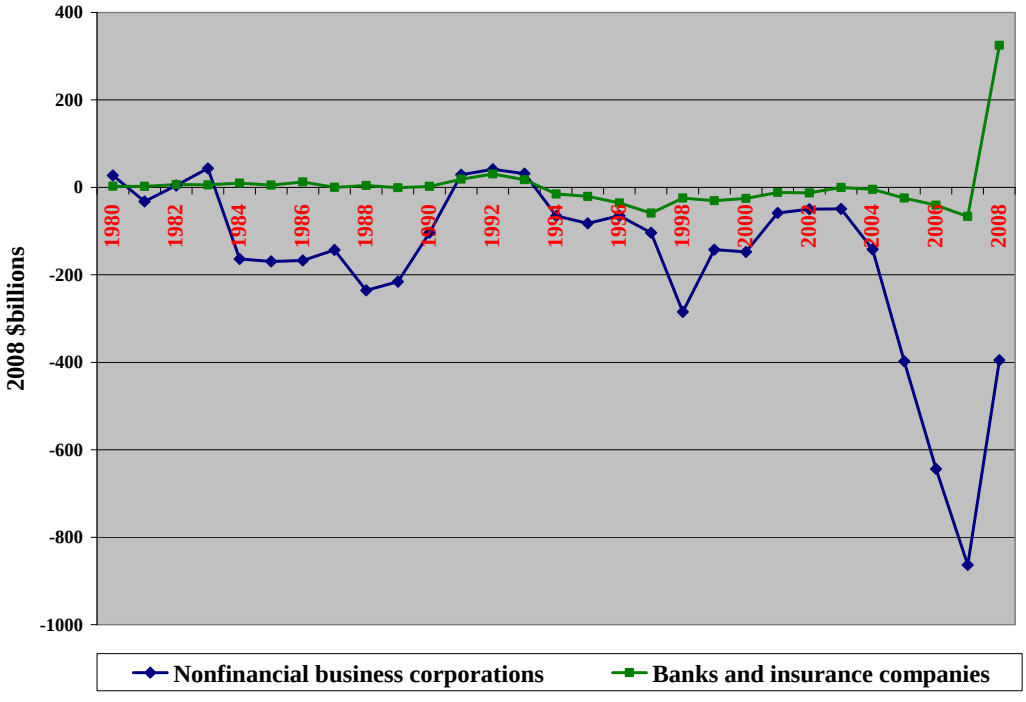
At the same time, however, New Economy companies such as Intel, AMD, Microsoft, Apple, Oracle, Solectron, EMC, Sun Microsystems, Cisco Systems, Dell, and Qualcomm were reinvesting virtually all of their incomes to finance the growth of their companies, neither (with the exception of Apple from 1987) paying dividends nor (once they had gone public) repurchasing stock. It was innovation by New Economy companies, most of them traded on NASDAQ, that culminated in the Internet revolution that provided a real foundation for the rising stock market in the 1980s and first half of the 1990s. Then, however, speculation took over, driving the stock market to unsustainable heights.

Meanwhile in the last half of the 1990s, in order to keep up with the booming stock market, Old Economy companies increased their stock repurchases significantly

compared with the first half of the decade. Data on 373 companies in the S&P 500 Index in January 2008 that were publicly listed in 1990 show that they expended an annual average of $106.3 billion (or $285 million per company) on stock repurchases in 1995-1999, representing 44.0 percent of their combined net income, compared with $25.9 billion (or $69 million per company) in 1990-1994, representing 23.2 percent of their combined net income. In the late 1990s the stage was being set for an even more massive manipulation of the market through stock repurchases by Old Economy and New Economy companies alike, especially from 2003.

As shown in Figure 2, using US Federal Reserve Flow of Funds data, in every year from 1994 through 2008 net equity issues of nonfinancial business corporations were negative, while net equity issues of commercial banks, savings institutions, and insurance companies taken as a group were negative from 1994 through 2007 before turning sharply positive in 2008. On net, that is, publicly-listed US corporations have been providing funds to the stock market, not receiving funds from it. In the Internet boom years of 1997 to 2000, the extent of this "negative cash function" of the stock market increased markedly as many companies sought to use repurchases to augment the positive impact of stock-market speculation on stock prices. Measured in 2008 dollars, net equity issues for nonfinancial corporations, banks, and insurers combined bottomed at -$285 billion in 1998 before rising to -$49 billion in 2003, the highest level in real terms since 1993. After 2003, however, net equity issues plunged to unprecedented negative levels, reaching -$863 billion in 2007.

Figure 2: Net Corporate Equity Issues (billions of 2008 dollars) in the United States by Nonfinancial Corporate Business and by Selected Financial Sectors, 1980-2008

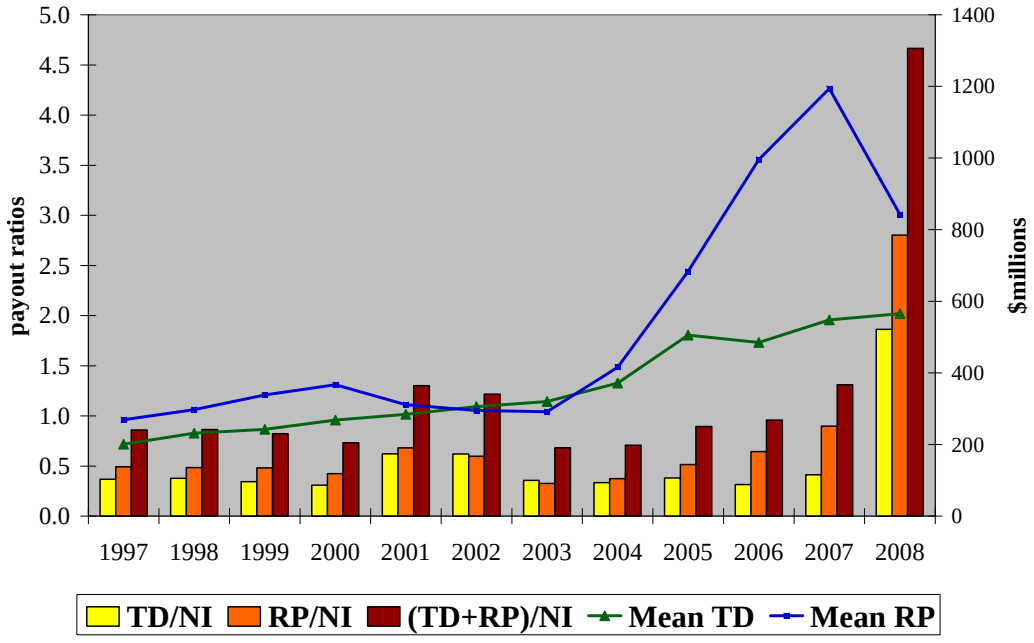


SOURCE: Board of Governors of the Federal Reserve System 2009, Table F.213.

In 2008 the financial crisis changed these figures dramatically. In current dollars, net equity issues for nonfinancial corporate business corporations went from -$831 billion in 2007 to -$395 billion in 2008, while those for financial institutions went from -$64 billion to $325 billion. The move by financial institutions to positive equity issues in 2008 was almost entirely the result of the change in net equity issues of commercial banks from -$24 billion in 2007 to $335 billion in 2008; many banks that in 2007 were large repurchasers of their own stock were, in the financial crisis of 2008, compelled to issue their stock at cut-rate prices in order to stay afloat.

We can observe the same trends in stock repurchases directly by examining the financial behavior of the 500 corporations included in the S&P 500 stock market index.[10] Combined, the 500 companies in the S&P 500 Index in January 2008 repurchased $486 billion of their own stock in 2006, representing 64 percent of their net income, and $592 billion in 2007, representing 91 percent of their net income. Figure 3 shows the payout ratios and mean payout levels for 438 companies in the S&P 500 Index in January 2008 that were publicly listed from 1997 through 2008.[11]

Figure 3: Ratios of Cash Dividends and Stock Repurchases to Net Income, and Mean Dividend Payments and Stock Repurchases among S&P 500 (438 companies), 1997-2008



NOTES:
1) Data for 438 corporations in the S&P 500 Index in January 2008 that were publicly listed 1997 through 2008.
2) RP, stock repurchases; TD, total dividends (common and preferred); NI, net income (after tax with inventory evaluation and capital consumption adjustments).

SOURCE: S&P Compustat database, 1997-2008; company 10-K filings for missing or erroneous data from the Compustat database.

[10] In presenting these data, I use the 500 companies in the S&P 500 Index on January 8, 2008.
[11] For each company, I treat the fiscal year as the calendar year in which its fiscal year ends.

Over the 12-year period, these 438 companies expended $2.4 trillion on stock repurchases, an average of $5.4 billion per company, and distributed a total of $1.6 trillion in cash dividends, an average of $3.8 billion per company. In 2007, as shown in Figure 3, these companies averaged $1,194 million in repurchases and $548 million in dividends, both record amounts.

As can be seen in Figure 3, in 2008 repurchases fell substantially for these 438 companies, constrained by a dramatic decline in combined net income from $583 billion in 2007 to $132 billion in 2008. Nevertheless, their combined repurchases only declined from $523 billion to $369 billion. As a result the repurchase payout ratio more than tripled from 0.90 to 2.80. In addition, these companies paid out $5 billion more in dividends in 2008 than in 2007, with the result that the dividend payout ratio leapt from 0.41 to 1.86. Allocated differently, the billions spent on buybacks could have helped stabilize the economy. Instead, collectively, these companies not only spent all their profits on repurchases but also ate into their capital.

Tables 6 and 7 provide data on the top 50 repurchasers among US corporations in the 2000s through 2008. From 2000 through 2008 these 50 companies expended a combined $1,454 billion on stock repurchases and distributed $876 billion in cash dividends. For this period, the combined repurchases of these top 50 repurchasers were 65 percent of their combined net income and their combined dividends 39 percent. In total, these companies spent an amount equivalent to almost 105 percent of their net income on distributions to shareholders.

In line with the time trend for buybacks in the 2000s for the 438 companies displayed in Figure 3, the 50 top repurchasers averaged $1.7 billion to $1.8 billion in buybacks per year from 2000 through 2003, but then jacked up this expenditure to $2.4 billion in 2004, $3.8 billion in 2005, $5.4 billion in 2006, and $6.1 billion in 2007, before falling back to $4.2 billion in 2008. With the US economy in financial meltdown in 2008, these fifty companies distributed cash equivalent to 104 percent of their net income to shareholders through buybacks and another 69 percent as dividends.

As shown in Table 6, these 50 companies were distributed across a range of industries, with 12 companies in financial services, including life and property insurance (italicized type);[12] 11 companies in ICT (bold type); and four companies each in pharmaceuticals and petroleum refining.

[12] Of the top 50 repurchasers for the period 2000-2007, there were 15 financial services companies on the list, including the 12 in Table 6, along with Lehman Brothers and Washington Mutual, both of which went bankrupt in 2008, as well as Wachovia, which was taken over by Wells Fargo. The acquisition of Merrill Lynch by Bank of America occurred on January 1, 2009. Merrill Lynch, which lost $27.6 billion in 2008 following losses of $7.8 billion the previous year, did not do any repurchases in 2008. It remained on the Top 50 list for 2000-2008, however because of the $21.0 billion it had repurchased in 2004-2007, including $9.1 billion in 2006 and $5.3 billion in 2007.

Table 6: Top 50 Repurchasers of Stock, 2000-2008, among Corporations in the S&P 500 Index in January 2008

RP Rank 2000-2008	Company	*Fortune* classi-fication	*Fortune* rank, 2008	RP ($m) 2007	RP ($m) 2008	RP ($m) 2000-2008
1	EXXON MOBIL	PR	1	31,822	35,734	144,038
2	**MICROSOFT**	CS	35	27,575	12,533	94,280
3	**IBM**	IT	14	18,828	10,563	72,881
4	*BANK OF AMERICA*	CB	11	3,790	0	55,674
5	**CISCO SYSTEMS**	NC	57	7,681	10,441	53,570
6	*GENERAL ELECTRIC*	DF	5	14,913	3,222	51,771
7	PFIZER	PH	46	9,994	500	50,632
8	**INTEL**	SC	61	2,788	7,195	48,770
9	PROCTER & GAMBLE	HP	20	5,578	10,047	46,371
10	**HEWLETT-PACKARD**	CO	9	10,887	9,620	43,341
11	*CITIGROUP*	CB	12	663	7	37,148
12	JOHNSON & JOHNSON	PH	29	5,607	6,651	33,345
13	*GOLDMAN SACHS*	CB	40	8,956	2,034	32,220
14	**DELL**	CO	33	3,026	4,004	29,549
15	**AT&T**	TE	8	10,390	6,077	27,705
16	WAL-MART STORES	GM	2	1,718	7,691	27,324
17	HOME DEPOT	SR	25	6,684	10,815	27,203
18	CHEVRON	PR	3	7,036	8,011	26,868
19	**ORACLE**	CS	113	3,937	2,023	25,962
20	TIME WARNER	EN	48	6,231	332	25,497
21	PEPSICO	FC	52	4,312	4,726	25,430
22	*WELLS FARGO*	CB	41	7.418	1,623	24,866
23	UNITEDHEALTH GROUP	HI	21	6,599	2,684	23,362
24	AMGEN	PH	168	5,100	2,268	22,629
25	WALT DISNEY	EN	60	6,923	4,453	22,268
26	*JPMORGAN CHASE*	CB	16	8,178	0	21,248
27	*MERRILL LYNCH*	SE	150	5,272	0	21,028
28	UPS	MP	43	2,639	3,570	20,944
29	*MORGAN STANLEY*	CB	30	3,753	711	19,761
30	ALTRIA GROUP	TO	160	0	1,166	19,379
31	MERCK	PH	103	1,430	2,725	18,709
32	**TEXAS INSTRUMENTS**	SC	215	4,886	2,122	18,418
33	CONOCOPHILLIPS	PR	4	7,001	8,249	18,099
34	*AMERICAN EXPRESS*	CB	74	3,572	218	17,861
35	MCDONALD'S	FS	107	3,943	3,919	16,797
36	CBS	EN	186	3,351	46	16,565
37	BOEING	AD	34	2,775	2,937	15,813
38	3M	MI	95	3,239	1,631	15,152
39	WELLPOINT	HC	32	6,151	3,276	14,867
40	*ALLSTATE*	IP	81	3,606	1,323	13,657
41	*PRUDENTIAL FINANCIAL*	IL	84	3,000	2,161	13,050
42	*U. S. BANCORP*	CB	129	1,983	0	12,313
43	**COMCAST**	TE	68	3,102	2,800	12,289
44	UNITED TECHNOLOGIES	AD	37	2,001	3,160	11,902
45	COCA-COLA	BE	73	1,838	1,079	11,668
46	KIMBERLY-CLARK	HP	128	2,813	653	10,655
47	CATERPILLAR	CF	44	2,405	1,800	10,496
48	CARDINAL HEALTH	WH	18	3,662	1,182	10,315
49	**APPLIED MATERIALS**	SC	315	1,332	1,500	10,241
50	VALERO ENERGY	PR	10	5,788	955	9,991

NOTES:
1) RP, repurchases of common and preferred stock; TD, common and preferred cash dividends; NI, net after-tax income. Bold indicates ICT companies, and italics indicate financial services companies.
2) Fortune industry classifications: AD, aerospace and defense; BE, beverages; CB, commercial banks; CF, construction and farm machinery; CO, computers, office equipment; CS, computer software; DF, diversified financials; EN, entertainment; FC, food, consumer products; FS, food services; GM, general merchandisers; HI, health: insurance and managed care; HP, household and personal products; IL, insurance: life, health; IP, insurance, property and casualty; IT, information technology services; MI, miscellaneous; MP, mail, package, freight delivery; NC, network/communications equipment; PH, pharmaceuticals; PR, petroleum refining; SC, semiconductors/electronic components; SE, securities; SR, specialty retailers; TE, telecommunications; TO, tobacco; WH, wholesalers, health care.

SOURCES: S&P Compustat database, 2000-2006; company 10-K filings, 2007; Fortune 2008

As is shown in Table 7, 13 of the top 50 distributed more cash to shareholders in the form of stock buybacks than they generated in net after-tax income from 2000 through 2008, while another eight companies repurchased stock equivalent to between 80 and 99 percent of their net income. Repurchase payouts were greater than net income at six of the 11 ICT companies on the list, while buybacks at Microsoft, IBM, and Intel ranged from 90 to 96 percent, with dividends thrown in to boot. The combined payouts for repurchases and dividends exceeded net income at 28 of the top 50 companies, and were between 80 and 99 percent of net income at another 16 companies.

Table 7: Payout Ratios and R&D Intensity Compared with Repurchases Intensity for the Top 50 Repurchasers of Stock, 2000-2008, among Corporations in the S&P 500 Index in January 2008

RP Rank 2000-2008	Company	RP/ NI%	TD/ NI%	(TD+RP)/ NI%	R&D/ SALES %	RP/ SALES %
1	EXXON MOBIL	58	25	83	0.2	5.7
2	**MICROSOFT**	95	51	146	**15.5**	27.6
3	IBM	96	17	113	5.6	8.9
4	BANK OF AMERICA	53	58	111	0.0	7.9
5	**CISCO SYSTEMS**	138	0	138	**15.7**	23.4
6	GENERAL ELECTRIC	34	52	86	1.7	3.9
7	**PFIZER**	73	71	144	**17.7**	13.1
8	**INTEL**	90	24	114	**14.5**	16.2
9	PROCTER & GAMBLE	76	43	119	3.4	9.3
10	HEWLETT-PACKARD	129	22	152	4.4	6.2
11	CITIGROUP	40	65	105	0.0	3.5
12	**JOHNSON & JOHNSON**	43	38	81	**12.6**	8.0
13	GOLDMAN SACHS	73	10	83	0.0	8.2
14	DELL	134	0	134	1.0	7.6
15	AT&T	39	68	108	0.5	4.8

RP Rank 2000-2008	Company	RP/ NI%	TD/ NI%	(TD+RP)/ NI%	R&D/ SALES %	RP/ SALES %
16	WAL-MART STORES	34	21	55	0.0	1.1
17	HOME DEPOT	71	18	89	0.0	4.7
18	CHEVRON	26	31	56	0.2	2.0
19	**ORACLE**	81	0	81	**12.1**	22.2
20	TIME WARNER	-59	-7	-67	0.3	7.3
21	PEPSICO	70	38	108	0.9	9.1
22	WELLS FARGO	47	49	96	0.0	7.1
23	UNITEDHEALTH GROUP	104	1	105	0.0	5.8
24	**AMGEN**	116	0	116	**27.0**	25.6
25	WALT DISNEY	106	21	127	0.0	8.1
26	JPMORGAN CHASE	34	56	90	0.0	3.3
27	MERRILL LYNCH	-281	-119	-401	0.0	5.7
28	UPS	80	45	125	0.0	5.9
29	MORGAN STANLEY	52	26	78	0.0	4.3
31	**MERCK**	35	54	89	**11.9**	6.7
32	**TEXAS INSTRUMENTS**	122	14	135	**16.2**	17.6
33	CONOCOPHILLIPS	44	32	76	0.1	1.7
34	AMERICAN EXPRESS	66	19	85	0.0	7.2
35	MCDONALD'S	82	37	119	0.0	9.9
36	CBS	-56	-10	-67	0.0	9.5
37	BOEING	74	33	107	4.3	3.1
38	3M	60	41	101	6.1	8.4
39	WELLPOINT	104	0	104	0.0	5.0
40	ALLSTATE	66	32	98	0.0	4.7
41	PRUDENTIAL FINANCIAL	83	17	100	0.0	4.9
42	U S BANCORP	40	58	98	0.0	8.5
43	COMCAST	109	5	114	0.0	6.8
44	UNITED TECHNOLOGIES	44	25	69	3.7	3.5
45	COCA-COLA	28	54	83	0.0	5.5
46	KIMBERLY-CLARK	70	46	116	1.8	7.5
47	CATERPILLAR	54	29	84	3.2	3.6
48	CARDINAL HEALTH	93	6	99	0.1	1.8
49	**APPLIED MATERIALS**	105	9	114	**14.1**	15.0
50	VALERO ENERGY	60	7	67	0.0	1.9

NOTES:

1) RP, repurchases of common and preferred stock; TD, common and preferred cash dividends; NI, net after-tax income; R&D, research and development expenditure.
2) Bold indicates companies with R&D expenditures that exceeded 10 percent of sales.
SOURCES: S&P Compustat database, company 10-K filings, 2000-2008.

Why Do Companies Repurchase Their Own Stock?

Companies often state explicitly in their financial statements that they are doing stock repurchases to offset dilution from their stock-option programs. The economic rationale for this argument is not clear. If a company deems it worthwhile to remunerate employees partially with stock options, it should see that remuneration as adding to rather than subtracting from earnings per share. True, these additions to earnings per share may be expected to accrue in years to come; but then the issue is simply one of whether remuneration in the form of stock options (or any other mode of compensation) is expected to yield positive net present value of future earnings at the appropriate discount rate. In any case, for many leading ICT companies, the number of shares repurchased

over the period 2000-2008 was well in excess of the number of stock options exercised, and hence the number needed to offset dilution. For example, at IBM this ratio was 3.97, Texas Instruments 3.53, Intel 3.15, HP 3.02, Dell 2.30, Oracle 2.24, Cisco Systems 2.19, Motorola 1.69, Microsoft 1.92, and Sun Microsystems 1.19.

Executives often claim that buybacks are financial investments that signal confidence in the future of the company and its stock-price performance (Louis and White 2007; Vermaelen 2005, ch. 3). In fact, however, companies that do buybacks never sell the shares at higher prices to cash in on these investments. To do so would be to signal to the market that its stock price had peaked.

According to the "signaling" argument, we should have seen massive sales of corporate stock in the speculative boom of the late 1990s, as was in fact the case of US industrial corporations in the speculative boom of the late 1920s when corporations took advantage of the speculative stock market to pay off corporate debt or bolster their corporate treasuries (O'Sullivan 2004). Instead, in the boom of the late 1990s corporate executives as *personal investors* sold their own stock to reap speculative gains (often to the tune of tens of millions). Yet, if anything, these same corporate executives as *corporate decision-makers* used corporate funds to repurchase their companies' shares, thus attempting to push speculative stock prices even higher – to their own personal gain. Given the extent to which stock repurchases have become a systematic mode of corporate resource allocation, and given the extent to which through this manipulation of their corporations' stock prices top executives have enriched themselves personally in the process, there is every reason to believe that, in the absence of legislation that restricts both stock repurchases and gains from stock options, executive behavior that places personal interests ahead of corporate interests will continue in the future.[13]

The reason why companies seek to manipulate the stock market with stock repurchases is not, therefore, a mystery. The very corporate executives who make these resource allocation decisions benefit immensely from the process. Stock repurchases are central to a massive redistribution process that in the United States has made the rich even richer at the expense of stable and equitable economic growth. It is a process that received ample encouragement from the inaptly-named Jobs and Growth Tax Relief Reconciliation Act of 2003 that reduced tax rates on dividends from 38.6 percent (the top tax on ordinary income) to 15 percent and on capital gains from 20 percent to 15 percent. Despite the fact that the 2003 Act reduced the tax on dividends even more than the tax on capital gains, since 2002, as we have seen, US corporations have increased stock repurchases even more than they have increased dividends.[14]

[13] Many countries do not permit stock repurchases, while others place restrictions on them. Prior to the 1980s the US Securities and Exchange Commission (SEC) had at times viewed stock repurchases as a manipulation of a company's stock price. In 1982, however, with the promulgation of Rule 10b-18, the SEC assured companies that manipulation charges would not be filed if each day's open-market repurchases were not greater than 25 percent of the stock's average daily trading volume. See Grullon and Michaely 2002.

[14] Also slowing the growth of dividends relative to repurchases is the fact that insofar as a company that pays dividends reduces its shares outstanding through repurchases, it automatically reduces the total amount of dividends that it pays out.

How Do Buybacks Affect Innovation and Employment?

How does the allocation of resources to stock repurchases affect the allocation of resources to other corporate objectives, including to innovative investments that could result in higher-quality, lower-cost products? Given their technological, market, and competitive characteristics, the different industries represented in Table 6 raise different issues for business and government policy.

As shown in Table 7, of the top 50 repurchasers, ten companies were R&D-intensive,[15] with six companies (Microsoft, Cisco Systems, Intel, Oracle, Texas Instruments, and Applied Materials) in ICT and four companies (Pfizer, Johnson & Johnson, Amgen, and Merck) in pharmaceuticals. While the four pharmaceutical companies spent less (albeit substantial sums) on repurchases than on R&D, the six ICT companies spent more. So too did IBM and HP, companies that, as we have seen, became much less research-intensive in making the transition from OEBM to NEBM.

There is no inherent relation between spending on R&D and distributions to shareholders. It is possible, however, that the financial resources that high-tech companies allocate to buybacks reduce the amount of resources that they allocate to R&D. For example, US pharmaceutical companies charge higher drug prices in the United States than in other rich nations such as Japan, Canada, and France because, their executives argue, they need the higher earnings to fund their R&D efforts in the United States. Yet the very same companies do massive stock buybacks for the sole purpose of manipulating their stock prices. Meanwhile, the United States is the world leader in biopharmaceuticals in large part because of $29 billion per annum that the National Institutes of Health spend in support of the life sciences knowledge base, as well as numerous government subsidies to the pharmaceutical industry, including those under the Orphan Drug Act of 1983 (see Lazonick and Tulum 2009). Instead of doing stock buybacks, the pharmaceutical companies could be contributing to the national life sciences effort, or lowering their drug prices to make their products more affordable to the American public.

As another example, Intel along with the Semiconductor Industry Association (SIA) lobbies the US Congress for more spending on the National Nanotechnology Initiative (NNI). At a press conference that the SIA organized in Washington DC in March 2005, Intel CEO Craig Barrett warned: "U.S. leadership in the nanoelectronics era is not guaranteed. It will take a massive, coordinated U.S. research effort involving academia, industry, and state and federal governments to ensure that America continues to be the world leader in information technology" (Electronic News 2005). In 2005 the annual NNI budget was $1.2 billion, just 11 percent of the $10.6 billion that Intel spent on stock repurchases in that year. Indeed, Intel's 2005 expenditures on stock buybacks exceed the total of $10.1 billion that has been spent on NNI since its inception in 2001 through 2009.[16] Given the extent to which the ICT industry in general, and a company like Intel in particular, has benefited from decades of government investments in the high-tech knowledge base, one might ask whether a portion of the massive funds that a company like Intel allocates to buying back its own stock could not be more productively allocated "to ensure that America continues to be the world leader in information technology."

[15] "R&D-intensive" is defined as R&D as a proportion of sales equal to or greater than 10 percent.

[16] In 2008 the NNI budget was $1,554 million with an estimated budget for 2009 of $1,657 million, and a proposed $1,640 million for 2010 (www.nano.gov/html/about/funding.html).

While high-tech companies spend money on buybacks to boost their stock prices, they boost their profits by terminating the employment of educated and experienced members of the US labor force in favor of employees in low-wage areas of the world – which in turn provides the "earnings" to sustain their buyback activity. As we have seen, in the late 2000s IBM, HP, and Intel all employ more people worldwide and fewer people in the United States than they did in the early 2000s. We have also seen that in the period 2000-2008 these three companies were among the largest repurchasers of their own stock in the United States. Over this period, the $72.9 billion that IBM spent on buybacks represented 97 percent of net income, with dividend payments adding another 17 percent. The $46.4 billion that HP allocated to buybacks amounted to 129 percent of net income, with dividend payments adding another 22 percent. The $48.8 billion that Intel disgorged on buybacks absorbed 90 percent of net income, with dividend payments adding another 24 percent. These corporate resources could have been used to sustain and create high-quality employment opportunities in the United States.

In the last quarter of 2008 and first quarter of 2009, repurchases among S&P 500 companies declined, as the buyback spending spree of the 2000s confronted the cash constraints of an economy in recession (Standard and Poor's 2009). Some companies that had been among the largest repurchasers fell into financial distress. Meanwhile, a number of companies that, despite the recession, remained profitable in late 2008 and early 2009 kept up the buyback habit, in some cases eating into their capital or borrowing money to do so.

During the first half of 2009 IBM bought back $3.5 billion in stock, even as it announced 9,600 layoffs of employees in the United States and Canada. Microsoft did $2.8 billion in buybacks in the fourth quarter of 2008, but then did none in the first and second quarters of 2009. But in September 2008 Microsoft's board authorized up to $6 billion in debt issues, some or all of which could be used for buybacks (PR Newswire 2008). In May 2009 Microsoft did a $3.75 billion bond issue – its first long-term debt offering – with a view to doing buybacks (PR Newswire 2009). In the same month, as part of the process, also unprecedented in its history, to reduce its payroll by 5,000, Microsoft was doing its second round of layoffs in 2009 (eWeek 2009). Similarly, Intel did $2.1 billion in buybacks in the third quarter of 2008, but none for the following three quarters. In January 2009 the company announced that it would do 5,000-6,000 layoffs over the course of the year (Deffree 2009). Then in July 2009 Intel announced a $1.75 billion convertible debt issue, of which $1.5 billion would be used to buy back shares (Associated Press Newswires 2009).

There has been virtually no public policy debate in the United States over the practice of buybacks, its acceleration in recent years, or the implications for innovation, employment, income distribution, and economic growth. Exceptionally, in the summer of 2008 US Senators Charles Schumer (D-NY) and Robert Menendez (D-NJ) and Representatives Rahm Emanuel (D-IL) and Ed Markey (D-MA) took aim at stock repurchases by the big oil companies, after Exxon Mobil, by far the largest repurchaser of stock, had announced record second quarter profits of $11.7 billion, of which $8.8 billion went to stock buybacks (US Congress 2008). Sen. Schumer was quoted as saying: "[The big oil companies] tell us they want to do more domestic production. They tell us they need to drill offshore. They tell us that they can find oil on the mainland. And what do

they do with their profits? They buy back stock, simply to increase their share price" (quoted in Hays and Ivanovich 2008).

In a letter to oil industry executives, the Congressmen asked them to "pledge to greatly increase the ratio of investments in production and alternatives to the amount of stock buybacks this year and next by investing much more of your profits into exploration and production on the leases you have been awarded in the U.S., and in the research and development of promising alternative energy sources" (US Congress 2008). Exxon Mobil did not pay much attention to this plea; in the last half of 2008 it repurchased another $17.5 billion for a total of $35.7 billion, or 79 percent of its net income, on the year. In the first half of 2009 Exxon Mobil did another $12.9 billion in buybacks, equivalent to 152 percent of its net income.

Resources have been misallocated to buybacks in other industries as well. For example, if bailed-out General Motors had banked the $20.4 billion distributed to shareholders as buybacks from 1986 through 2002 with a 2.5 percent after-tax annual return, it would have had $35 billion of its own cash in 2009 to stave off bankruptcy and respond to global competition. Among the biggest stock repurchasers in the years prior to the financial crisis were many of banks that were responsible for the meltdown and were bailed out under the Troubled Asset Relief Program. They included Citigroup ($41.8 billion repurchased in 2000-2007), Goldman Sachs ($30.1 billion), Wells Fargo ($23.2 billion), JP Morgan Chase ($21.2 billion), Merrill Lynch ($21.0 billion) Morgan Stanley ($19.1 billion), American Express ($17.6 billion), and US Bancorp ($12.3 billion). In the eight years before it went bankrupt in 2008, Lehman Brothers repurchased $16.8 billion, including $5.3 billion in 2006-2007. Washington Mutual, which also went bankrupt in 2008, expended $13.3 billion on buybacks in 2000-2007, including $6.5 billion in 2006-2007. Wachovia, ranked 38th among the Fortune 500 in 2007, did $15.7 billion in buybacks in 2000-2007, including $5.7 billion in 2006-2007, before its fire sale to Wells Fargo at the end of 2008. Other financial institutions that did substantial repurchases in the 2000s before running into financial distress in 2008 were AIG ($10.2 billion), Fannie Mae ($8.4 billion), Bear Stearns ($7.2 billion), and Freddie Mac ($4.7 billion). By spending money on buybacks during boom years, these financial corporations reduced their ability to withstand the crash of the derivatives market in 2008, thus exacerbating the jeopardy that they created for the economy as a whole.

Are top executives who spend much of their time and energy thinking about how to manipulate the stock market through stock repurchases devoting sufficient time and energy to thinking about how to confront the technological, market, and competitive uncertainties with which, in a globalized economy, even the most powerful companies must be concerned? From a public policy perspective, should the people who exercise strategic control over the allocation of corporate resources have such overwhelming personal incentives to allocate those resources to manipulate their companies' stock prices? To ask these questions about corporate governance is to raise the larger public policy issues of whether the stock market should be so central to the operation of the economy. A vital first step in addressing these questions is to jettison the ideology that maximizing shareholder value leads to the highest common good.

The Transformation of Corporate Governance

The Ideology of Shareholder Value: A Critique

In all of the richest economies, business corporations are repositories of large, and in many cases vast, quantities of resources over which corporate managers, rather than markets, exercise allocative control. Indeed, it can be argued that corporate control, as distinct from market control, of resource allocation represented the defining institutional characteristic of 20th-century capitalist economies. Whereas the conventional theory of the market economy maintains that markets should allocate resources to achieve superior economic performance, the actual pervasiveness of corporate control over resource allocation demands a theory of the ways in which corporate governance affects economic performance.

During the 1980s and 1990s, the argument that maximizing shareholder value results in superior economic performance came to dominate the corporate governance debates. This shareholder-value perspective represents an attempt to construct a theory of corporate governance that is consistent with the neoclassical theory of the market economy. Like the theory of the market economy, however, the shareholder-value perspective lacks a theory of innovative enterprise. As a result, the shareholder-value perspective on corporate governance fails to comprehend how and under what conditions the corporate allocation of resources supports investment in innovation at the level of the business enterprise and contributes to the achievement of stable and equitable growth at the level of the economy as a whole (Lazonick and O'Sullivan 2000: Lazonick 2004b).

For adherents of the theory of the market economy, "market imperfections" necessitate managerial control over the allocation of resources, thus creating an "agency problem" for those "principals" who have made investments in the firm. The agency problem derives from two limitations, one cognitive and the other behavioral, on the human ability to make allocative decisions. The cognitive limitation is "hidden information" (also known as "adverse selection" or "bounded rationality") that prevents investors from knowing a priori whether the managers whom they have employed as their agents are good or bad resource allocators. The behavioral limitation is "hidden action" (also known as "moral hazard" or "opportunism") that reflects the proclivity, inherent in an individualistic society, of managers as agents to use their positions as resource allocators to pursue their own self-interests and not necessarily the interests of the firm's principals.

These managers may allocate corporate resources to build their own personal empires regardless of whether the investments that they make and the people whom they employ generate sufficient profits for the firm. They may hoard surplus cash or near-liquid assets within the corporation, thus maintaining control over uninvested resources, rather than distributing these extra revenues to shareholders. Or they may simply use their control over resource allocation to line their own pockets. According to agency theory, in the absence of corporate governance institutions that promote the maximization of shareholder value, one should expect managerial control to result in the inefficient allocation of resources.

The manifestation of a movement toward the more efficient allocation of resources, it is argued, is a higher return to shareholders. But why is it shareholders for whom value should be maximized? Why not create more value for creditors by making their financial investments more secure, or for employees by paying them higher wages and benefits, or

for communities in which the corporations operate by generating more corporate tax revenues? Neoclassical financial theorists argue that among all the stakeholders in the business corporation only shareholders are "residual claimants". The amount of returns that shareholders receive depends on what is left over after other stakeholders, all of whom it is argued have guaranteed contractual claims, have been paid for their productive contributions to the firm. If the firm incurs a loss, the return to shareholders is negative, and vice versa.

By this argument, shareholders are the only stakeholders who have an incentive to bear the risk of investing in productive resources that may result in superior economic performance. As residual claimants, moreover, shareholders are the only stakeholders who have an interest in monitoring managers to ensure that they allocate resources efficiently. Furthermore, by selling and buying corporate shares on the stock market, public shareholders, it is argued, are the participants in the economy who are best situated to reallocate resources to more efficient uses. The agency problem – the fact that public shareholders as the (purported) principals who bear risk are obliged to leave the corporate allocation of resources under the control of managers as their "agents" – poses a constant threat to the efficient allocation of resources.

Within the shareholder-value paradigm, the stock market represents the corporate governance institution through which the agency problem can be resolved and the efficient allocation of the economy's resources can be achieved. Specifically, the stock market can function as a "market for corporate control" that enables shareholders to "disgorge" – to use Michael Jensen's evocative term – the "free cash flow". As Jensen (1986, 323), a leading academic proponent of maximizing shareholder value, put it in a seminal 1986 article:

> Free cash flow is cash flow in excess of that required to fund all projects that have positive net present values when discounted at the relevant cost of capital. Conflicts of interest between share-holders and managers over payout policies are especially severe when the organization generates substantial free cash flow. The problem is how to motivate managers to disgorge the cash rather than investing it at below cost or wasting it on organization inefficiencies.

How can those managers who control the allocation of corporate resources be motivated, or coerced, to distribute cash to shareholders? If a company does not maximize shareholder value, shareholders can sell their shares and reallocate the proceeds to what they deem to be more efficient uses. The sale of shares depresses that company's stock price, which in turn facilitates a takeover by shareholders who can put in place managers who are willing to distribute the free cash flow to shareholders in the forms of higher dividends and/or stock repurchases. Better yet, as Jensen argued in the midst of the 1980s corporate takeover movement, let corporate raiders use the market for corporate control for debt-financed takeovers, thus enabling shareholders to transform their corporate equities into corporate bonds. Corporate managers would then be "bonded" to distribute the "free cash flow" in the form of interest rather than dividends (Jensen 1986, 324).

Additionally, as Jensen and Murphy (1990), among others, contended, the maximization of shareholder value could be achieved by giving corporate managers stock-based compensation, such as stock options, to align their own self-interests with

those of shareholders. Then, even without the threat of a takeover, these managers would have a personal incentive to maximize shareholder value by investing corporate revenues only in those "projects that have positive net present values when discounted at the relevant cost of capital" and distributing the remainder of corporate revenues to shareholders in the forms of dividends and/or stock repurchases.

During the 1980s and 1990s, maximizing shareholder value became the dominant ideology for corporate governance in the United States. Top executives of US industrial corporations became ardent advocates of this perspective; quite apart from their ideological predispositions, the reality of their stock-based compensation inured them to maximizing shareholder value. During the decade of the 1970s, the stock market had languished, and inflation had eroded dividend yields. In the 1980s and 1990s, however, as shown in Table 5 above, high real stock yields characterized the US corporate economy. The long stock market boom of the 1980s and 1990s combined with the remuneration decisions of corporate boards to create this pay bonanza for corporate executives.

To some extent, as I have argued, the stock market boom of the 1980s and 1990s was driven by New Economy innovation. By the late 1990s, however, innovation had given way to speculation as a prime mover of stock prices. Then, after the collapse of the Internet bubble at the beginning of the 2000s, corporate resource allocation sought to restore stock prices through manipulation in the form of stock buybacks. This massive "disgorging" of the corporate cash flow manifests a decisive triumph of agency theory and its shareholder-value ideology in the determination of corporate resource allocation.

Did this financial behavior lead to a more efficient allocation of resources in the economy, as the proponents of maximizing shareholder-value claim? The evidence on the impact of stock buybacks on innovation and employment that I presented above should lead one to question this hypothesis. Indeed, there are a number of flaws in agency theory's analysis of the relation between corporate governance and economic performance. These flaws have to do with 1) a failure to explain how, historically, corporations came to control the allocation of significant amounts of the economy's resources; 2) the measure of "free cash flow"; and 3) the claim that only shareholders have "residual claimant" status. These flaws stem from the fact that agency theory, like the neoclassical theory of the market economy in which it is rooted, lacks a theory of innovative enterprise. These flaws are, moreover, amply exposed by the history of the industrial corporation in the United States, the national context in which agency theory evolved and in which it is thought to be most applicable.

Agency theory makes an argument for taking resources out of the control of inefficient managers without explaining how, historically, corporations came to possess the vast amounts of resources over which these managers could exercise allocative control (see Lazonick 1992). From the first decades of the 20th century, the separation of share ownership from managerial control characterized US industrial corporations. This separation occurred because the growth of innovative companies demanded that control over the strategic allocation of resources to transform technologies and access new markets be placed in the hands of salaried professionals who understood the investment requirements of the particular lines of business in which the enterprise competed. At the same time, the listing of a company on a public stock exchange enabled the original owner-entrepreneurs to sell their stock to the shareholding public. Thereby enriched, they

were able to retire from their positions as top executives. The departing owner-entrepreneurs left control in the hands of senior salaried professionals, most of whom had been recruited decades earlier to help to build the enterprises. The resultant disappearance of family owners in positions of strategic control enabled the younger generation of salaried professionals to view the particular corporations that employed them as ones in which, through dedicated work effort over the course of a career, they could potentially rise to the ranks of top management.

With salaried managers exercising strategic control, innovative managerial corporations emerged as dominant in their industries during the first decades of the century. During the post-World War II decades, and especially during the 1960s conglomerate movement, however, many of these industrial corporations grew to be too big to be managed effectively. Top managers responsible for corporate resource allocation became segmented, behaviorally and cognitively, from the organizations that would have to implement these strategies. Behaviorally, they came to see themselves as occupants of the corporate throne rather than as members of the corporate organization, and became obsessed by the size of their own remuneration. Cognitively, the expansion of the corporation into a multitude of businesses made it increasingly difficult for top management to understand the particular investment requirements of any of them (Lazonick 2004a).

In the 1970s and 1980s, moreover, many of these US corporations faced intense foreign competition, especially from innovative Japanese corporations (also, it should be noted, characterized by a separation of share ownership from managerial control). An innovative response required governance institutions that would reintegrate US strategic decision makers with the business organizations over which they exercised allocative control. Instead, guided by the ideology of maximizing shareholder value and rewarded with stock options, what these established corporations got were managers who had a strong personal interest in boosting their companies' stock prices, even if the stock-price increase was accomplished by a redistribution of corporate revenues from labor incomes to capital incomes and even if the quest for stock-price increases undermined the productive capabilities that these companies had accumulated from the past.

Agency theory also does not address how, at the time when innovative investments are made, one can judge whether managers are allocating resources inefficiently. Any strategic manager who allocates resources to an innovative strategy faces technological, market, and competitive uncertainty. Technological uncertainty exists because the firm may be incapable of developing the higher-quality processes and products envisaged in its innovative investment strategy. Market uncertainty exists because, even if the firm succeeds in its development effort, future reductions in product prices and increases in factor prices may lower the returns that can be generated by the investments. Finally, even if a firm overcomes technological and market uncertainty, it still faces competitive uncertainty: the possibility that an innovative competitor will have invested in a strategy that generates an even higher-quality, lower-cost product that enables it to win market share.

One can state, as Jensen did, that the firm should only invest in "projects that have positive net present values when discounted at the relevant cost of capital." But, quite apart from the problem of defining the "relevant cost of capital," anyone who contends that, when committing resources to an innovative investment strategy, one can foresee the

stream of future earnings that are required for the calculation of net present value knows nothing about the innovation process. It is far more plausible to argue that if corporate managers really sought to maximize shareholder value according to this formula, they would never contemplate investing in innovative projects with their highly uncertain returns (see Baldwin and Clark 1992).

Addressing the third point, it is simply not the case, as agency theory assumes, that all the firm's participants other than shareholders receive contractually guaranteed returns according to their productive contributions. The argument that shareholders are the sole residual claimants is a deduction from the theory of the market economy. It does not, however, accord with the reality of the innovative enterprise. The argument that a party to a transaction receives contractually guaranteed returns may hold when, in an open, competitive market, one firm purchases a physical commodity as a productive input from another firm. But, as I elaborate below, one cannot assume contractually guaranteed returns when the inputs are made available to business enterprises by the state. Nor can one make the assumption when the inputs are made available to the business enterprise in the form of the labor services of employees. Finally, once one recognizes that the innovative enterprise cannot be understood as a "nexus of contracts", one can ask whether public shareholders actually perform the risk-bearing function that the proponents of agency theory claim.

Given its investments in productive resources, the state has residual-claimant status. Any realistic account of economic development must take into account the role of the state in 1) making infrastructural investments that, given the required levels of financial commitment and inherent uncertainty of economic outcomes, business enterprises would not have made on their own; and 2) providing business enterprises with subsidies that encourage investment in innovation. In terms of investment in new knowledge with applications to industry, the United States was the world's foremost developmental state over the course of the 20th century (see Lazonick 2008). As a prime example, it is impossible to explain US dominance in computers, microelectronics, software, and data communications without recognizing the role of government in making seminal investments that developed new knowledge and infrastructural investments that facilitated the diffusion of that knowledge (see, for example, National Research Council 1999).

The US government has made investments to augment the productive power of the nation through federal, corporate, and university research labs that have generated new knowledge as well as through educational institutions that have developed the capabilities of the future labor force. Business enterprises have made ample use of this knowledge and capability. Although these business enterprises may pay fees for these services – for example, the salary of an engineer whose education was supported in whole or in part by state funds – one would be hard put to show that there exists a nexus of contracts that guarantees the state a return on these investments for the productive contributions that the outputs of these investments make to the enterprises that use them. In effect, in funding these investments, the state (or more correctly, its body of taxpayers) has borne the risk that the nation's business enterprises would further develop and utilize these productive capabilities in ways that would ultimately redound to the benefit of the nation, but with the return to the nation in no way contractually guaranteed.

In addition, the US government has often provided cash subsidies to business enterprises to develop new products and processes, or even to start new firms. Sometimes these subsidies have been built into the rates that firms in particular industries could charge as regulated monopolies. For selected industries, tariff protection has provided firms with the time to develop higher-quality, lower-cost products. The public has funded these subsidies through current taxes, borrowing against the future, or by making consumers pay higher product prices for current goods and services than would have otherwise prevailed. By definition, a "subsidy" lies beyond the realm of a market-mediated contract; one dictionary definition is "monetary assistance granted by a government to a person or group in support of an enterprise regarded as being in the public interest" (Dictionary.com 2009). Multitudes of business enterprises have benefited from subsidies without having to enter into contracts with the public bodies that have granted them to remit a guaranteed return from the productive investments that the subsidies help to finance.

Similar to the government, workers can also find themselves in the position of having made investments in their own productive capabilities that they supply to firms without a guaranteed contractual return. In an important contribution to the corporate governance debate, Margaret Blair (1995) argued that, alongside a firm's shareholders, workers should be accorded residual-claimant status because they make investments in "firm-specific" human capital at one point in time with the expectation – but without a contractual guarantee – of reaping returns on those investments over the course of their careers. Moreover, insofar as their human capital is indeed firm-specific, these workers are dependent on their current employer for generating returns on their investments. A lack of interfirm labor mobility means that the worker bears some of the risk of the return on the firm's productive investments, and hence can be considered a residual claimant. Blair goes on to argue that if one assumes, as shareholder-value proponents do, that only shareholders bear risk and residual-claimant status, there will be an underinvestment in human capital to the detriment of not only workers but the economy as a whole.

For those concerned about the propensity of US corporations to downsize-and-distribute, Blair's focus on investments in firm-specific human capital provides a stakeholder theory of the firm in which workers as well as shareholders should be viewed as principals for whose benefit the firm should be run. However, a corporate executive intent on downsizing his labor force could logically argue that the productive capabilities of workers in, say, their 50s who had made investments in firm-specific human capital earlier in their careers have now become *old* because of competition from equally adept but more energetic younger workers or, alternatively, *obsolete* because of technological change. The executive could then argue that, in making investments in firm-specific human capital in the past, these (now) older workers had taken on the risk-bearing function, and like any risk-bearing investor, must accept the possibility that their investments would at some point lose their market value.

The workers could respond by arguing that the corporate executive is wrong; their accumulated capabilities are not old or obsolete, but rather, given a correct understanding of technological, market, and competitive conditions in the industry, remain critical to the innovation process. They might even, as principals, accuse the executive (as their agent) of acting opportunistically, perhaps because he has stock options that align his interests with shareholders. They might claim that what the proposed downsizing actually entails

is a redistribution of income from labor to capital rather than a restructuring of the workforce for the purpose of innovation. Clearly, even from the workers' point of view, agency theory's concerns with hidden information and hidden action on the part of managers are relevant. The problem is that agency theory provides no guide to analyzing whether or not the executive is in fact acting innovatively or opportunistically because agency theory, like the neoclassical theory of the market economy more generally, has no theory of innovative enterprise.

Investments that can result in innovation require the strategic allocation of productive resources to particular processes to transform particular productive inputs into higher-quality, lower-cost products than those goods or services that were previously available at prevailing factor prices. Investment in innovation is a direct investment that involves, first and foremost, a strategic confrontation with technological, market, and competitive uncertainty. Those who have the abilities and incentives to allocate resources to innovation must decide, in the face of uncertainty, what types of investments have the potential to generate higher-quality, lower-cost products. Then they must mobilize committed finance to sustain the innovation process until it generates the higher-quality, lower-cost products that permit financial returns.

What role do public shareholders play in this innovation process? Do they confront uncertainty by strategically allocating resources to innovative investments? No. As portfolio investors, they diversify their financial holdings across the outstanding shares of existing firms to minimize risk. They do so, moreover, with limited liability, which means that they are under no legal obligation to make further investments of "good" money to support previous investments that have gone bad. Indeed, even for these previous investments, the existence of a highly liquid stock market enables public shareholders to cut their losses instantaneously by selling their shares – what has long been called the "Wall Street walk".

Without this ability to exit an investment easily, public shareholders would not be willing to hold shares of companies over the assets of which they exercise no direct allocative control. It is the liquidity of a public shareholder's portfolio investment that differentiates it from a direct investment, and indeed distinguishes the public shareholder from a private shareholder who, for lack of liquidity of his or her shares, must remain committed to his or her direct investment until it generates financial returns. The modern corporation entails a fundamental transformation in the character of private property, as Adolf Berle and Gardiner Means (1932) recognized. As property owners, public shareholders own tradable shares in a company that has invested in real assets; they do not own the assets themselves.

Indeed, the fundamental role of the stock market in the United States in the 20th century was to transform illiquid claims into liquid claims on *the basis of investments that had already been made*, and thereby separate share ownership from managerial control. Business corporations sometimes do use the stock market as a source of finance for new investments, although the cash function has been most common in periods of stock market speculation when the lure for public shareholders to allocate resources to new issues has been the prospect of quickly "flipping" their shares to make a rapid speculative return. Public shareholders want financial liquidity; investments in innovation require financial commitment. It is only by ignoring the role of innovation in the economy, and the necessary role of insider control in the strategic allocation of corporate resources to

innovation, that agency theory can argue that superior economic performance can be achieved by maximizing the value of those actors in the corporate economy who are the ultimate outsiders to the innovation process.

Corporate Governance for Sustainable Prosperity

In March 2009, with the US economy, and indeed the world economy, in the throes of a deep recession brought on by financial speculation, John F. Welch, Jr., ex-CEO of General Electric, and a man who according to his 2001 autobiography speaks "straight from the gut" (Welch 2001), told a *Financial Times* reporter (Guerrera 2009): "On the face of it, shareholder value is the dumbest idea in the world. Shareholder value is a result, not a strategy…your main constituencies are your employees, your customers and your products." Welch went on to reiterate: "It is a dumb idea. The idea that shareholder value is a strategy is insane. It is the product of your combined efforts – from the management to the employees."

So much for the most dominant ideology of the purpose for which a corporation should be run. In the 2000s, even Michael Jensen, chief academic cheerleader for maximizing shareholder value in the 1980s and 1990s, appears to have had second thoughts about the applicability of the theory (Jensen 2001 and 2004). Yet the damage that has been inflicted on the US economy by this ideology has been enormous. It has legitimized the norm that all the matters to superior economic performance is making money, and the policy stance that government's role is to deregulate any activity that stands in the way of making money. "Maximizing shareholder value" is, in short, the dominant ideology – or, as Welch put it, "the dumb idea" – behind the current crisis of US capitalism.

To extricate the economy from the crisis, the critical area for strategic policy intervention – yet one that even in the midst of the current crisis continues to be virtually absent from the US policy debate – is corporate governance, by which I mean the institutions and mechanisms that determine and regulate the ways in which business corporations allocate resources. More specifically, for the sake of generating stable and equitable growth, government policy must focus on the role of the stock market in the corporate allocation of resources. I have argued that stock-price movements can be driven by innovation, speculation, and manipulation. The general objective of government policy in the area of stock-market regulation should be to control the forces of speculation and manipulation in the determination of stock-price movements so that the stock market can function to support, and stock-price movements reflect, innovation.

A prelude to such policy intervention is a rejection of the overwhelmingly dominant ideology that maximizing shareholder value results in superior economic performance. A rejection of this ideology will not be easy. Shareholder-value ideology derives its credibility from the theory of the market economy that dominates the thinking of academic economists. It is, however, a theory that cannot come to grips with the role of the developmental state and the innovative enterprise in the process of economic growth (Lazonick 2008).

In practice, the financial affairs of US households, businesses, and governments have become tied up with the stock market. Powerful financial interests, including the top executives of major US corporations, who profit enormously from the willingness of

households and money managers to speculate on the stock market, will vigorously oppose any significant policies that threaten to bring their party to an end.

One might argue that, given that they are so invested in the stock market, US households also benefit from the boosts to stock prices that stock buybacks generate. There are problems with this argument. Insiders who know when buybacks are actually to occur (as distinct from when the authorization of a repurchase amount is announced) will be best positioned to take advantage of subsequent stock-price increases. More generally, households as "outsiders" lack the sophistication and knowledge of corporate executives and money managers as "insiders" to gain from stock-price volatility. Moreover, even before the financial turmoil of 2008, the evidence on the expected retirement earnings from pension assets suggests that working households were not well-served by corporate securities markets in the 2000s (Munnell and Sundén 2006; Sorokina et al. 2008). The best way to ensure income security in retirement is to have well-paid employment as long as one can be productive. Yet with the rise to dominance of the New Economy business model, even the best educated and most experienced middle-aged workers have faced insecure employment conditions, not only in recessions but also in booms.

Corporate stock repurchases and executive stock options must be brought under control if stable and equitable economic growth is to become a possibility over the next generation. The US government needs to enact legislation that restricts, and indeed even forbids, the practice of corporate stock repurchases. It is a practice that only serves to manipulate the stock market in the interests of those with the power to allocate corporate resources. If economics is about the "optimal" allocation of resources to achieve superior economic performance, stock buybacks on the scale to which corporate executives and Wall Street have become accustomed represent a gargantuan misallocation of resources in the US economy.

The government also needs to enact legislation that drastically reins in top executive pay, which means placing restrictions on stock-based remuneration, especially stock options. The greatest gains from stock options come in periods of stock-market speculation, when holders of options benefit from the fact that in the United States there is virtually never any requirement that option gains can only be reaped if, for example, a company's stock performs better than that of comparable companies in its industry. And when the market is less speculative, corporate executives can allocate resources to stock buybacks to give a boost to the company's stock price. Presto, the "performance" of the company improves, and it is time once again for executives to sell the shares acquired from exercising their abundant options. Is it a surprise, as investigations into the current financial crisis have revealed, that top corporate executives are prone to speculate with other people's money and to manipulate earnings per share when they are remunerated in ways that encourage them to speculate with other people's money and manipulate earnings per share?

The problem of exploding executive pay has been around for a long time, and virtually nothing has been done about it. The last serious challenge to the legitimacy of executive stock options in the US Congress was in the 1960s when Senator Albert Gore (1965) was engaged in a battle with corporate tax-dodgers. Congress did not go as far as Gore would have liked, but over the next decade, through the Tax Reform Act of 1976, there was a legislative movement toward restricting the tax advantages of stock options. All that changed in the last half of the 1970s as the newly organized high-tech lobby

swung into action and got the capital-gains tax reduced, accounting rules changed, and ensured that stock repurchases would be freely permitted to enhance the benefits of employee stock options.

The one attempt in the 1990s by Democrats to control the rise of executive pay ended up doing just the opposite. In 1993, after Bill Clinton became President of the United States, his administration implemented a campaign promise to legislate a cap of $1 million on the amount of nonperformance-related, top-executive compensation that could be claimed as a corporate tax deduction. One perverse result of this law was that companies that were paying their CEOs less than $1 million in salary and bonus *raised* these components of CEO pay toward $1 million, which was now taken as the government-approved "CEO minimum wage". The other perverse result was that companies increased CEO stock-option awards, for which tax deductions were not in any case being claimed, as an alternative to exceeding the $1 million salary-and-bonus cap (Byrne 1994 and 1995).

A further irony of the Clinton legislation was that the high-tech lobby at the time was fighting against an attempt by the Financial Accounting Standards Board (FASB) to require companies to expense stock options. Especially for companies with broad-based stock option plans, this prospective regulatory change would have resulted in lower reported earnings that, it was thought, would result in lower stock prices. Hence, even though the proposed FASB regulation (which was ultimately decreed in 2004) would have reduced the corporate tax bill, corporate executives were against it. Why would these same executives have given much thought to the fact that there would be no *corporate* tax deductions for personal pay that exceeded the million-dollar cap?

Then as now, it is futile to talk about placing restrictions on executive compensation without limiting the extent to which executives can reap gains from stock options that result from either speculation or manipulation. Besides making manipulative stock repurchases illegal, legislation is needed to place limits on stock-option grants to individuals and to make the gains from the exercise of stock options dependent on achieving a variety of performance goals, including first and foremost ongoing contributions to job creation in the United States.

Finally, to pay for the many things that the United States needs, taxes on stock-based income, whether in the form of dividends or capital gains, need to be raised substantially. By lowering both the capital-gains and dividend tax rates to 15 percent, the Jobs and Growth Tax Relief Reconciliation Act of 2003 further lined the pockets of those who receive stock-based income, including income from the exercise of qualified stock options that can receive capital-gains tax treatment. The dubious rationale behind these tax cuts for the rich was that they would spawn real investment and economic growth. The result, however, has been to give corporate executives even greater incentives to do stock repurchases, a mode of resource allocation that reduces the number of productive jobs that US corporations could generate for the US labor force.

OEBM was hardly perfect, but it did provide employment security, health coverage, and retirement benefits to tens of millions of people whose work was at the heart of the economy. Under NEBM, the corporate economy no longer assumes these collective functions. In an era of open standards, rapid technological change, convergence of technologies, and intense global competition, business enterprises do need to be flexible in the deployment of capital and labor. One way of attaining this flexibility is by giving

the organized labor force a major role in enterprise governance, as for example the Japanese, Germans, and Swedes have done, each in their own particular ways. In such a system, there is the possibility of an interaction between business and government to provide widespread economic security in employment and retirement while permitting business enterprises to remain innovative and competitive on a global scale.

The other way is the American way in the era of NEBM, which, in an updated version of what I have called "the myth of the market economy" (Lazonick 1991), works under the pretense that the collective provision of economic security is not required. Just get enough education to be "employable" in a well-paid job, and individual initiative will provide one with the lifetime of security that one needs. From the NEBM perspective, the only legitimate function of the government is to invest in the knowledge base, and even then with no notion that, through taxation, a substantial proportion of the gains from innovative enterprise that this knowledge base makes possible should be returned to the government to support the ongoing development of the economy as a whole.

In the United States in the 2000s, the quest for economic security evades even a substantial portion of the better educated population. In its stead stands the quest for shareholder value; the worship of wealth in the 2000s has rewritten the 1980s' motto "greed is good" to read "greed is god." The small minority of the population that controls the allocation of corporate resources is reaping unprecedented wealth – even when some among them cause a financial meltdown – while demanding that the government spend more of the taxpayers' money on knowledge creation and warning that only lower taxes on their wealth can keep the spirit of innovation alive. With the aid of a compliant government, NEBM may continue to generate respectable US economic growth – although, given global competition and the US financial crisis, even that outcome is in doubt. What does seem certain is that for a growing majority of Americans, the stock-market oriented political economy that has NEBM as its foundation will continue to generate instability and inequity as a normal way of life.

References:

Abowd, John, John Haltiwanger, Julia Lane, Kevin L. McKinney, and Kristin Sandusky, 2007, "Technology and the Demand for Skill: An Analysis of Within and Between Firm Differences," NBER Working Paper no. 13043, National Bureau of Economic Research.

AFL-CIO, 2009, "Executive PayWatch," at http://www.aflcio.org/corporatewatch/paywatch/pay/index.cfm.

Associated Press Newswires, 2009, "Intel sells $1.75 billion of 3.25 percent notes, plans stock buyback," *Associated Press Newswires*, July 22.

Baldwin, Carliss, and Kim Clark, 1992, "Capabilities and Capital Investment: New Perspectives on Capital Budgeting," *Journal of Applied Corporate Finance*, 5, 2: 67-87.

Barrett, Craig, 2006, Interviewed by Tom Ashbrook, *On Point*, WBUR, February 11.

Berle, Adolf A., and Gardiner C. Means, 1932, *The Modern Corporation and Private Property*, Macmillan: New York.

Blair, Margaret, 1995, *Ownership and Control: Rethinking Corporate Governance for the Twenty-First Century*, Brookings Institution: Washington DC.

Board of Governors of the Federal Reserve System, 2009, "Flow of Funds Accounts of the United States," at http://www.federalreserve.gov/releases/z1/, June 11.

Brown, Clair, John Haltiwanger, and Julia Lane, 2006, *Economic Turbulence: Is a Volatile Economy Good for America?*, University of Chicago Press: Chicago.

Brown, Clair, and Greg Linden, 2008, "Is There a Shortage of Engineering Talent in the U.S.?," Center for Work, Technology, and Society Working Paper, University of California, Berkeley.

Business Week, 1981, "Intel's leap into computers," *Business Week*, November 16.

Byrne, John A., 1994, "That's some pay cap, Bill," *Business Week*, April 25.

Byrne, John A., 1995, "CEO pay: Ready for takeoff," *Business Week*, April 24.

Chandler, Jr., Alfred D., 2001, *Inventing the Electronic Century: The Epic Story of the Consumer Electronic and Computer Industries*, Free Press: New York.

Chang, Y. S., 1971, "The Transfer of Technology: Economics of Offshore Assembly, The Case of the Semiconductor Industry," UNITAR Research Report no. 11. Geneva: United Nations Institute for Training and Research.

Deffree, Suzanne, 2009, "Intel closes factories, slashes up to 6000 jobs," *Electronic News*, January 26.

Dictionary.com, 2009, "Subsidy," at dictionary.reference.com/search?q=subsidy.

Doran, James, 2009, "IBM set to axe thousands in move to cheap labour abroad," *The Observer*, April 12.

Electronic News, 2005, "US could lose race for nanotech leadership, SIA panel says," *Electronic News*, March 16.

eWeek, 2009, "Microsoft announces round two of layoffs," *eWeek*, May 5.

Farber, Henry, 2008, "Job Loss and the Decline of Job Security in the United States," Princeton University Industrial Relations Section Working Paper no. 520, Princeton University, June 4; at http://www.irs.princeton.edu/pubs/pdfs/520revised.pdf.

Flamm, Kenneth, 1985, "Internationalization in the Semiconductor Industry," in Joseph Grunwald and Kenneth Flamm eds., *The Global Factory: Foreign Assembly in International Trade*, Brookings Institution: Washington DC: 38-136.

Fortune, 2008, "Fortune 500 Largest U.S. Corporations," Fortune 157, 9, at http://money.cnn.com/magazines/fortune/fortune500/2008/index.html.
Gompers, Paul, and Josh Lerner, 2002, *The Venture Capital Cycle*, MIT Press: Cambridge, MA.
Gore, Albert, 1965, "How to be rich without paying taxes," *New York Times*, April 11.
Grullon, Gustavo, and Roni Michaely, 2002, "Dividends, Share Repurchases, and the Substitution Hypothesis," *Journal of Finance*, 57, 4: 1649–1684.
Guerrera, Francesco, 2009, "Welch rues short-term profit 'obsession'," *Financial Times*, March 12.
Hall, Brian J., and Jeffrey B. Leibman, 1998, "Are CEOs Really Paid Like Bureaucrats?" *Quarterly Journal of Economics*, 113, 3: 653-691.
Hays, Kristen, and David Ivanovich, 2008, "Politicians fume as Exxon profits," *Houston Chronicle*, August 1.
Heim, Kristi, 2004, "U.S. high-tech giants invest in future competitor," *San Jose Mercury News*, March 15.
Hewlett-Packard, 1984, *Annual Report*.
IBM, 2007, *Annual Report*.
IBM, 2008, *Annual Report*.
Jensen, Michael C., 1986, "Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers," *American Economic Review*, 76, 2: 323-329.
Jensen, Michael C., 2001, "Value Maximization, Stakeholder Theory, and the Corporate Objective Function," *European Financial Management*, 7, 3: 297-317.
Jensen, Michael C., 2004, "The Agency Costs of Overvalued Equity and the Current State of Corporate Finance," *European Financial Management*, 10, 4: 549-565.
Jensen, Michael C., and Kevin J. Murphy, 1990, "Performance Pay and Top Management Incentives," *Journal of Political Economy*, 98, 2: 225-264.
Jensen, Michael C., Kevin J. Murphy, and Eric G. Wruck, 2005, "CEO Pay…and How to Fix It," Harvard Business School NOM Working Paper no. 04-28, March, at http://www.nber.org/~confer/2005/si2005/cg/jensen.pdf.
Konrad, Rachel, 2005, "Hewlett-Packard ousts CEO Fiorina," *Seattle Times*, February 10.
Kotkin, Joel, 1985, "Is IBM good for America?" *Washington Post*, October 6.
Lazonick, William, 1991, *Business Organization and the Myth of the Market Economy*, Cambridge University Press: Cambridge.
Lazonick, William, 1992, "Controlling the Market for Corporate Control: The Historical Significance of Managerial Capitalism," *Industrial and Corporate Change*, 1, 3: 445-488.

Lazonick, William, 2004a, "Corporate Restructuring," in Stephen Ackroyd, Rose Batt, Paul Thompson, and Pamela Tolbert, eds., *The Oxford Handbook of Work and Organization*, Oxford University Press: Oxford: 577-601.

Lazonick, William, 2004b, "The Innovative Firm," in Jan Fagerberg, David Mowery, and Richard Nelson, eds., *The Oxford Handbook of Innovation*, Oxford University Press: Oxford: 29-55.

Lazonick, William, 2008, "Entrepreneurial Ventures and the Developmental State: Lessons from the Advanced Economies," World Institute of Development Economics Research Discussion Paper dp2008-01, at http://www.wider.unu.edu/publications/working-papers/discussion-papers/2008/en_GB/dp2008-01/_files/78805634425684379/default/dp2008-01.pdf.

Lazonick, William, 2009a, "The buyback boondoggle," *Business Week*, August 24 & 31.

Lazonick, William, 2009b, *Sustainable Prosperity in the New Economy?: Business Organization and High-Tech Employment in the United States*, Upjohn Institute for Employment Research, Kalamazoo MI.

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

Lazonick, William, and Öner Tulum, 2009, "US Biopharmaceutical Finance and the Sustainability of the Biotech Boom," University of Massachusetts Lowell Center for Industrial Competitiveness, paper presented at the Sloan Industry Studies Conference, Chicago, May 29 (revised July).

Lerner, Josh 2002, "Boom and Bust in the Venture Capital Industry and the Impact on Innovation," *Economic Review*, 87, 4: 25-39.

localtechwire.com, 2009, "No joke – IBM sought patent for offshoring method," *localtechwire.com*, April 1, at localtechwire.com/business/local_tech_wire/opinion/blogpost/4856832.

Louis, Henock, and Hal White, 2007, "Do Managers Intentionally Use Repurchase Tender Offers to Signal Private Information?: Evidence from Firm Financial Reporting Behavior," *Journal of Financial Economics*, 85, 1: 205-233.

McDougall, Paul, 2009, "IBM offers to move laid off workers to India," *Information Week*, February 2.

McNerney, Donald, 1996, "HR Practices: HR Adapts to Continuous Restructuring," *HR Focus*, 73, 1: 4-6.

Munnell, Alicia H., and Annika Sundén, 2006, "401(k) Plans Are Still Coming Up Short," Center for Retirement Research Issues in Brief no. 43, Center for Retirement Research at Boston College.

National Research Council, 1999, *Funding a Revolution: Government Support for Computing Research*, National Academies Press: Washington DC.

O'Sullivan, Mary, 2004, "What Drove the U.S. Stock Market in the Last Century?" INSEAD Working Paper, Fontainebleau, France.

Packard, David, 1995, *The HP Way: How Bill Hewlett and I Built Our Company*, HarperBusiness: New York.

PricewaterhouseCoopers, 2008, "MoneyTree Report," at https://www.pwcmoneytree.com/MTPublic/ns/index.jsp.

PR Newswire, 2008, "Microsoft announces share repurchase program and increases quarterly dividend," *PR Newswire*, September 22.

PR Newswire, 2009, "Microsoft announces debt offering," *PR Newswire*, May 11.
Robertson, Jordan, 2009, "NA US IBM layoffs," *Associated Press Newswires*, March 25.
Schultze, Charles L., 1999, "Downsized & Out: Job Security and American Workers," *Brookings Review*, 17, 4: 9-17.
Schuyten, Peter J., 1979, "To clone a computer: Neophyte National Semiconductor has jolted the industry," *New York Times*, February 4.
Sorokina, Olga, Anthony Webb, and Dan Muldoon, 2008, "Pension Wealth and Income: 1992, 1998, and 2004," Center for Retirement Research Issues in Brief no. 8-1, Center for Retirement Research and Boston College.
Standard and Poor's, 2009, "S&P 500 stock buybacks retreat 73% in the first quarter; Lowest since second quarter of 2003," *PR Newswire*, June 18.
US Congress, 2008, "Democrats tell big oil: Spend more on production and renewable energy, less on stock buybacks before making demands for new drilling leases," *US Congressional Documents and Publications*, July 31, at http://menendez.senate.gov/newsroom/record.cfm?id=301639.
US Congress, 2009, *Economic Report of the President*, US Government Printing Office: Washington DC.
US Department of Homeland Security, 2002–2004, "Characteristics of Specialty Occupation Workers (H-1B)," US Government Printing Office: Washington, DC, at http://www.uscis.gov/files/article/FY2002Charact.pdf, http://www.uscis.gov/files/article/FY03H1BFnlCharRprt.pdf, http://www.uscis.gov/files/nativedocuments/H1B_FY04_Characteristics.pdf.
US Department of State, 1997-2008, Tables on non-immigrant visa issuances by visa class and by nationality, at http://www.travel.state.gov/visa/frvi/statistics/statistics_4396.html.
Vermaelen, Theo, 2005, *Share Repurchases: Foundations and Trends in Finance*, now Publishers: Hanover, MA.
Welch, Jack, with John A. Byrne, 2001, *Jack: Straight from the Gut*, Warner Books: New York.
Whyte, William H., 1956, *The Organization Man*, Simon & Schuster: New York.
Wikipedia, 2009, "H-1B Visa," at http://en.wikipedia.org/wiki/H-1B_visa.