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Fligstein, Neil

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Myths of the Market*

Neil Fligstein

Department of Sociology

University of California

Berkeley, Ca. 94720

U.S.A.

* The arguments in this paper are elaborated at greater length in "The Architecture of Markets" (Princeton University Press, 2001).

Introduction

The U.S. economy is often held up as the model of the "free enterprise" system where competition produces firm efficiency and dynamism. The American federal and state governments are pictured as uninvolved or unimportant in these processes. They stay out of the way of market actors, do not try and pick firms or technologies as winners and losers, and if they intervene, it is only to make sure that competition is maintained. In reality, understanding this dynamism is more complex. The American government has been intimately involved in the functioning of its economy in ways that would be quite familiar to Europeans. Moreover, the growth and nurturing of new markets are not left entirely to the devices of entrepreneurs. They are helped by a whole array of institutions that are both public and private. My purpose here is not to deny that entrepreneurship and competition matter for the creation of new markets and industry. Instead, it is to supplement our understanding of those activities by demonstrating that they cannot occur without governments and stable social structures to support them.

Two primary forces shape firms' strategic actions: the behavior of their competitors and the actions of the government to define what is competitive and anti-competitive behavior between firms. My key argument is that

managers and owners in firms search for stable patterns of interactions with their largest competitors. If firms are able to set up stable patterns of interaction that prove to be both legal and profitable, they work to reproduce those patterns. These stable patterns of interaction are based on a set of strategies about what works to make money. Managers and owners across firms develop expectations of one another's behavior and that increases the reproducibility of their positions in the market. So, for example, in the American market for soft drinks, two firms, Pepsi Cola and Coca Cola dominate. Their basic strategy of competition is to compete over market share through advertising and discounting their products. Their domination of that market has remained stable for the past 40 years.

There are three main ways that the U.S. government has directly affected market activities in particular markets.[1] First, the government makes laws and rules that determine tax policies, rules governing the use of equity and debt by corporations, employment relations, the enforcement of patents and property rights, and competition policy. They also make rules that directly can favor certain firms in particular industries often at the behest of the most powerful actors in those industries.[2] Second, the government can act as a buyer of products and a provider of research and development funds to firms. In the U.S., the Defense Department has always played an important role in this regard. Third, governments fund research in universities and provide support for developing technologies. They also encourage the commercialization of useful products. The main kind of market intervention that the U.S. government has shied away from in the past 30 years is the direct ownership of firms. Although even here, there has been and continues to be government ownership of utilities. It is useful to show how these types of market interventions by the U.S. government helped provide the backdrop for change. Governments helped build up public and private infrastructure that gave the impetus for the possibility for new firms and industries to emerge.

In this paper, I consider two major developments in the American economy that have been typically hailed as emblematic of the working out of free markets: the emergence of the “shareholder value” conception of the firm and the rise and growth of Silicon Valley, the home to successive waves of innovation in the computer industry. My purpose is to show how these phenomena were not just caused by entrepreneurial activity. Instead, both were embedded in preexisting social relations and in both cases, the government played a pivotal role in pushing forward the conditions for “entrepreneurial activity”.

The Case of Shareholder Value

In order to apply this general understanding about the link between governments and markets to the case of shareholder value, it is important to understand what shareholder value is, the nature of the market order that it implies, what existed before "shareholder value", why the idea of "shareholder value" emerged, and the role of government in aiding the reorganization of firms under the rubric of "maximizing shareholder value". The shareholder value conception of the firm refers to a set of understandings about the relationships between the top managers of publicly held corporations, boards of directors, and the equities markets, where the owners of firms buy and sell shares (Jensen, 1989; Fama and Jensen, 1983). The main idea is that the job of top managers is to insure the highest possible profits for their shareholders. The relationships between managers, boards of directors and equities markets involve monitoring, rewarding, and sanctioning managers in order to get them to maximize profits. Boards of directors are supposed to monitor managers by tying their pay to performance and if performance based incentives fail to produce high profits, to change management teams. If boards of directors fail to monitor managers closely enough, then the equity markets will punish firms when owners begin to sell stock and the share price of the firm drops. If managers and boards of directors continue to ignore taking actions to increase profits, the final source of discipline for recalcitrant firms is the hostile takeover. Here, a new team of owners and managers will take over the assets by buying them at the depressed price and use them more fruitfully in the pursuit of maximizing shareholder value.

The market that the shareholder value conception of the firm describes is the market for corporate control. The market for corporate control concerns how teams of owners and managers seek out opportunities to use assets to make profits. The shareholder value conception of the firm is an idealized version of how this market is supposed to work. Owners and managers who are effective at making profits retain the rights over assets. Other owners will want to purchase the stock of such a firm (which are claims over the profit produced by the assets). The current share price reflects the current and future prospects of the management team in exploiting those assets to produce profits. When managers fail to produce sufficient profit, their share price begins to fall as owners sell stock. If the price falls sufficiently, a new group of owners and managers will appear to take control over those assets and try and raise the profits of the firm.

The shareholder value conception of the firm requires several institutional features. First, of course, there have to be in place the "right" kinds of laws and rules to allow boards of directors and equity markets to function in this way. This includes rules about protecting shareholder rights, rules governing accounting practices, and rules allowing hostile takeovers. Second, stock ownership has to be sufficiently defused so that it is possible for teams of owners and managers to be able to make bids for all of the shares of firms. If firms are tightly controlled by a family,

a bank, a government, or cross holding of various corporations, it will be difficult if not impossible to make a takeover bid without cooperation from those groups. The U.S. is unlike most industrialized societies in that ownership of the stock of the largest corporations is highly diffused (Roe, 1994; Roe and Blair, 2000). Huge amounts of stock are publicly bought and sold on the equities markets and it is possible, if you have enough money to buy majority stakes in almost all of the largest corporations.

Societies that might be interested in creating a market for corporate control in order to force firms to maximize shareholder value would have to undertake a series of political reforms for such a market to emerge. This market would not emerge "naturally", but would require active interventions by the state. Existing systems of property rights tend to favor currently existing economic elites who certainly would try and prevent governments from undermining their economic power. Given a lack of pressure from these elites, it is easy to see why most European governments have not put these kinds of reforms into place. Not surprisingly, only Great Britain fully followed the U.S. lead in this regard in the past 20 years. It is useful to ask how and why the shareholder value conception of the firm came to dominate the market for corporate control in the U.S. Obviously, the managerial elite of large corporations is an entrenched economic interest who would appeal to the state to protect their position. In order to understand the vulnerability of those managers and the rise of shareholder value, one must understand what existed before shareholder value.

The finance conception of the firm emerged during the merger movement of the 1960s to govern the market for corporate control (Fligstein, 1990: ch. 7). At this time, the firm was first conceived of as a bundle of assets that managers would deploy and re-deploy by the buying and selling of firms in order to maximize profits. During the 1960s, diversified portfolios of product lines would be manipulated to maximize profits. The idea had three parts. First, firms could smooth out business cycles by investing in businesses that performed differently as the economy expanded and contracted. Second, financial oriented managers would have closer control over assets and thus, be able to use them to make more money than either passive investors in stock portfolios, or as they might make as free standing firms. Finally, financially oriented executives would be able to make investments in firms and evaluate the likelihood that their investments would succeed.

There were two conditions that produced the finance conception. First, large firms in the postwar era were already fairly diversified in their product lines. The problem of internally controlling a large number of products opened an opportunity for executives who could claim to evaluate the profit potential of each product line. Finance executives reduced the information problem to the rate of return earned by product lines and thereby made the large diversified corporation manageable. Second, the federal government was strictly enforcing the antitrust laws in the early postwar era and had passed an anti-merger law that made it difficult to merge with direct competitors or suppliers. This had the unintended consequence of encouraging firms to engage in mergers with firms who produced radically different products to produce growth and avoid government intervention. This gave financial executives more legitimacy because they could claim to have the expertise to evaluate the prospects for products outside of a firm's main lines by making those evaluations in financial terms (Fligstein, 1990, ch. 6).

The most spectacular organizational examples of the new finance conception came from firms outside the mainstream of American corporate life. The men who pioneered the acquisitive conglomerate (Tex Thornton at Textron, Jim Ling at L-T-V, and Harold Geneen at ITT) showed how financial machinations involving debt could be used to produce rapid growth with little investment of capital. All of the financial forms of reorganization, including hostile takeovers, divestitures, leveraged buyouts, the accumulation of debt, and stock repurchasing, were invented or perfected in this period. The 1960s witnessed a large- scale merger movement whereby many of the largest corporations substantially increased their size and diversification. As a result of this success, finance executives increasingly became CEOs of large corporations. By 1969, the finance conception of control had come to dominate the market for corporate control and by implication, the strategies and structures of the largest American firms.

The finance conception of control, which dominated the market for corporate control during the 1960s, therefore already viewed the firm in primarily financial terms. The shareholder value conception of control is also a financial set of strategies, but it had a particular critique of the finance conception of the firms as it had evolved during the 1960s and 1970s. It viewed the principal failure of the finance conception of control as the failure to maximize shareholder value by its failure to raise share prices. What caused this critique to evolve?

The large American corporation in the early 1980s was under siege from two exogenous forces: the high inflation and slow economic growth of the 1970s, and increased foreign competition. Foreign competition, particularly with the Japanese, heated up and American firms lost market shares and, in some cases, entire markets, like in consumer electronics. The inflation of the 1970s had a set of negative effects on large corporations. Their real assets (i.e. land, buildings, machines) were increasing in value. High interest rates pushed investors towards fixed income securities like government bonds and stock prices drifted downward over the decade. The main reaction for managers during this crisis was to leave assets undervalued on their books. Because of the high inflation and poor economic conditions, profit margins were squeezed. If firms revalued assets, then their financial performance would even look worse as standard measures of performance (like return on assets) would make poor profits stand out even more. Firms avoided borrowing money because of high interest rates. This meant that firms kept large amounts of cash on hand. With low stock prices, undervalued assets, and lots of cash, by the late 1970s, many large American firms had stock prices that valued them as being worth less than their assets and cash (Friedman, 1985). There was a crisis of profitability during the 1970s for managers of large firms. The conditions were right for some form of change in the conception of control governing large corporations. There were three problems: what would that analysis of problems look like, who would spearhead it, and what role would government play in sparking the new conception of the firm?

During the late 1970s in America, the discourse of deregulation was already taking shape in the political arena. The Carter Administration embraced the view that one way out of the economic crisis known as “stagflation” (high inflation, low economic growth) was to deregulate product and labor markets. The theory suggested that

deregulation would stimulate competition, force down wages, and end inflation. Lower prices would result and this would stimulate consumption and economic growth. The Carter Administration began to experiment by deregulating the airlines and trucking industries. The presidential election of 1980 brought Ronald Reagan into power. Reagan embraced a pro-business, anti-government agenda to combat economic hard times. One of his first acts in power was to break the air traffic controllers union. This sent a chill throughout organized labor in the U.S. and accelerated the decline in unions that was already taking place.

Reagan's Administration did several things that directly encouraged the merger movement of the 1980s. William Baxter, Reagan's attorney general in charge of antitrust, had been an active opponent of the antitrust laws while a lawyer and academician. In 1981, he announced new merger guidelines. These guidelines committed the government to approving almost all mergers except those that lead to concentration ratios within particular markets of greater than 80%. This gave the green light to all forms of mergers, large and small, vertical and horizontal. The Reagan Administration also substantially reduced corporate income taxes at the same time. Reagan encouraged firms to use this largesse to make new investments in the economy. The kind of investments that most of them made, were mergers. From this perspective, the 1980s market for corporate control was driven by the crisis in the already existing finance conception of the firm and the changes in the regulatory environment, which encouraged firms to use the market for corporate control to reorganize their assets.

The interesting question is, who came up with the shareholder value conception of the firm and how did they relate to those who were working with the finance conception of control? Given what is now known about the merger movement, the main actors were institutional investors that include investment banks, insurance companies, and mutual funds provided some of the stimulus to pushing forward the shareholder value conception of the firm. The idea of maximizing shareholder value can be traced back to agency theory and financial economics. Institutional investors began to realize that some firms had market values that were less than the value of their saleable assets. This kind of financial analysis implied that the managers were not maximizing shareholder value because buyers of equity were evaluating the prospects of the firm in such negative terms, that the value of the firm was less than its assets.

Savvy financial analysts began to realize that by breaking firms up, they could make money. Part of the problem for investment bankers and other institutional investors was raising the cash to engage in hostile takeovers. The most important financial invention of the period was the creation of high yield or junk bonds to aid these purchases. These bonds could be used to buy up the shares of the firm, and then the new owners could engage in internal reorganization of the firm to pay the debt down. These reorganizations would involve layoffs and the sale of

assets. The shareholder value rhetoric argued that these reorganizations should not worry about workers, consumers, or suppliers, but instead, their aim was to make more money for the owners of the assets.

The shareholder value conception of the firm is touted as the main corporate governance solution to the problem of making corporations more competitive (Jensen, 1989). Did these reorganizations result in firms that would make higher profits and restore American firms to leadership positions in industries where they lost out in the 1970s? The empirical literature shows that the answer to both of these questions is "no". People who benefited the most from the 1980s merger movement were those who sold the shares of stock to firms engaging in mergers. But, the new owners of the assets made no higher profits on average than either the firm made previously or firms in their industry were making (Jensen and Ruback, 1994). This result will come as a surprise for readers not familiar with this literature. There is an assumption that shareholder value style governance will result in the best allocation of a firm's assets and increase profits. But because many of the takeovers involved the use of debt, firms had a hard time showing higher levels of profit given their high levels of debt and their elevated equity prices.

The link between maximizing shareholder value and competitiveness is even more tenuous. The literature on competitiveness shows that the main factors that determine whether or not a firm is competitive have to do with its competencies at organizing production and creating new and useful technologies (Piore and Sabel, 1984; Porter, 1991; Womack, Jones, and Roos, 1991). Having these competencies is strongly related to treating employees fairly or making investments in the future. A narrow focus on shareholders to the exclusion of other constituencies in the firm may result in the exodus of the best people in the firm. It may also result in under investment in the future of the firm. This can undermine the competitiveness of the firm. It should not be surprising that American corporations never regained ground in industries where they lost competitive advantage to the Japanese and the Europeans (i.e. consumer electronics, automobiles, luxury goods, and high end precision machines) by attempting to maximize "shareholder value". Instead, American managers would exit product lines where they could not dominate. Instead of trying to make better products, they would divest themselves of the assets.

By touting deregulation as the solution to all economic problems, the American government began the discourse that allowed the "shareholder value conception of the firm" to blossom. Deregulation of product and labor markets was thought to be the tonic to restore the American economy to its former growth. But deregulation did not mean that the government was going to entirely get out of the business of regulating markets, contracts, taxes, labor, and capital. The government also provided the institutional infrastructure for the maximization of shareholder value by producing regulation of equity and bond markets. It provided tax incentives and capital for mergers and told corporations that it would not disapprove of any mergers. It refused to consider passing laws to protect anyone's

rights but shareholders. It also encouraged firms to re-write the labor contract to make workers grow more insecure. While the government did not invent the idea of "maximizing shareholder value", it continuously worked to advantage the owners of capital in order to increase their profitability.

The Case of Silicon Valley and the Computer Industry

The explosion of information technology that occurred at the end of the 20th century has created a whole new set of markets. Let me tell the story of these markets from the perspective of those who favor the view that this has occurred as a result of the spontaneous actions of entrepreneurs. Many believe that these new technologies are transforming the world we live in (Castells, 1996). This story has captured the attention of journalists, policymakers, and scholars. These markets are supposed to be creating new kinds of firms that are flatter, more networked, and thus, quicker to take advantage of opportunities (Castells, 1996; Saxenian, 1994). The new firms learn and change constantly, because if they stop, they die. In doing so, they are creating wealth beyond what anyone has ever imagined. They are also transforming work for the people who run them. People leave and exit firms rapidly, and stock options are a huge part of what attracts work teams to put in extremely high hours to push a new product innovation to market. Silicon Valley and its imitators in Austin, Seattle, Washington, D.C., Boston, New York City (Silicon Alley), and Ann Arbor are living proof that the future belongs to quick, constantly learning, small firms that maintain alliances and networks to keep them alive.

In this new world, firms do not form monopolies because technology will not let it happen. Firms that try to create proprietary processes or products will find others inventing new things in order to go around them. So, Apple (with its proprietary computer operating system) and Sony (with its beta VCR system) found themselves on the losing end of markets as consumers preferred open systems that produced more standard products that were cheaper. Intel and Microsoft with the "open" architecture of their products spawned whole industries of suppliers of hardware and software built on the openness of their systems. The lesson of these firms was that fortunes were not to be made by trying to be proprietary, but instead, by being "open". The way to win was to get there first and have your product adopted as the standard because it was the best. To prevent being blown away by the next generation of the technology, one needed to keep one's product developing, and organizational learning was the only answer. Keeping in touch with competitors and customers, and using networks to evolve products was the only way to stay in the game. This closed the virtuous circle by which the best technology won out, and the firm that produced the technology only stayed in place if it continued to evolve as other technologies evolved.

In the "old" industrial economics, the bigger a firm got, the less product the market could absorb, the lower the price for the product, and the marginal profit on selling an additional unit of the product would eventually drop to zero. A whole new branch of economics claims that this "law" has been repealed. Information technologies produce "increasing returns to scale" (Arthur, 1994). The cost of making a product like software is high at the beginning. But if the product becomes a standard, the market locks -in around the product. This lock-in occurs because consumers get used to a particular product and because other related producers build their products around it. The marginal cost of producing additional products is very low because the cost of the floppy disk, in the case of software, is so small. If the product becomes an industry standard, the profits go up as each additional unit of output is sold because the cost of producing an additional amount of the product is near zero.

Moreover, all of this change in the “new economy” is being done without any input from governments. Governments are not actively regulating these markets, choosing winning and losing technologies, or making investments that promote one set of firms over another. It is the knowledge-based industries, invented in universities, driven by entrepreneurs that learn from each other, that are creating this new community of firms. By and large, Silicon Valley (and its imitators) has not relied on the government in any important way for its development. Indeed, the decentralized nature of the markets and the open standards of products are often characterized as antithetical to the slow moving, unimportant bureaucracies of governments.

It turns out that there a great many problems with this story. First and most important, it fails to recognize the pivotal role that the government has played as producer of rules that concern issues relevant to hardware and software manufacturers, as funders of research and development, as buyers of products, and as funders of basic and applied research in and around universities. Moreover, these are the early days of many of these new markets. At the beginning of markets, there is always a social movement-like flow of firms to start out. New entrants proliferate and many conceptions of action seem possible. The small, “networked, learning” firm is a strategy for new firms to follow as these markets emerge. Firms face an uncertain market and no one knows which products will be hits. The “networked, learning firm” is a model to deal with these problems. In essence, it makes a virtue out of a vice. If one cannot engage in controlling the competition, one can try and be connected enough to other firms to know what is happening and to try and anticipate where the market is going.

In this section, I want to consider two issues. First, what has been the role of government in the waves of inventions that have created the computer, software, telecommunications, and internet industries in general and how did the government help nurture Silicon Valley? Second, I am interested in considering the degree to which the image we have of the industry as small and nimble meshes with the ways in which firms appear to have organized

themselves to make money. The question is, will these markets settle on these forms because it will be impossible for bigger firms pursuing more stability-oriented tactics to emerge because of the rapid shifts in technology? Or will some grow large by stabilizing technologies and having control whereby their products lock in a particular market?

There have been four waves of innovation in these industries. World War II and the Cold War stimulated the first by providing backing for innovations in products that were related to radio, microwaves, radar, and guided missile systems. The second came in the late 1950s with the invention and commercial production of the integrated circuit, which became the basis of the semiconductor industry. The first and most important use of these circuits was for guided missile systems. The third wave was personal computers beginning in the 1970s. Finally, in the 1990s, the Internet was invented and experienced explosive growth. The government played a part in all of these periods of invention. In some it played a more direct role and in others, more indirect. I will review some of the literature here in order to make this role more explicit.

Before World War II, there was a small electronics industry in Silicon Valley (Sturgeon, 2000). Most of the electronics firms in the U.S. were operated by large corporations and were located in the east. The first real stimulus to the growth of the modern electronics industry in Silicon Valley was World War II. During World War II, the electronics industry in Silicon Valley expanded dramatically. For example, Hewlett Packard, the original Silicon Valley firm, expanded from 9 employees and $70,000 in sales in 1939 to over 100 employees and over $1 million in sales by 1943 due entirely to sales to the U.S. military. During the 1950s, the fastest growing firm in Silicon Valley was Varian Associates, which sold over 90% of its production to the Defense Department. By the late 1950s, Hewlett Packard, Varian, Lockheed, and other firms were selling the bulk of their computer, electronics, and guided missiles/space vehicles to the government (Henton, 2000).

The Defense Department was not just a customer for the region during this period. Leslie (2000) argues that the war effort had pushed along a number of related inventions, in particular advances in tube technology, but also in opening up parts of the electromagnetic spectrum. During the early years of the Cold War, the Defense Department became the most important supplier of money for research and development and the purchaser of many early versions of different technologies. Much of this money poured into firms. But, the government also underwrote research and education at many universities. Bresnahan (1999) estimates that over 70% of the research support in engineering, computer science and related fields came from the federal government. At least half of the graduate students in these fields were supported by federal funds as well. More than half of the papers published in computer science journals cite federal funding as pivotal to their research.

One of the biggest recipients of this largesse was Stanford University. The Dean of the Stanford Business School during this period, Frederick Terman, was instrumental in making the Stanford Engineering School the leading research site on the west coast. Terman recognized that the growth of industry in Silicon Valley depended on building research infrastructure in the region. To do this, the Engineering School would need to develop close intimate ties to the government (Leslie, 2000). He was extremely successful in his efforts. Stanford University set up many programs to exploit the potential linkage between business, government, and students and professors. Terman pioneered the strategy of encouraging professors and students with good ideas to set up shop in the Silicon Valley as private firms. His most successful case was Hewlett-Packard. He often worked his connections in government and business to help in these efforts. Stanford University also provided engineers trained in various fields for firms to employ. One of the other features of the Valley that Terman helped promote was the origin of the venture capital industry. He acted as a financial backer of Hewlett-Packard and helped them find funding to expand their activities. During the 1950s, venture capitalists came to Silicon Valley to underwrite both Varian and Associates and Fairchild Semiconductor. All were encouraged to do so because these firms had a natural market for their products in government.

The transistor, semi-conductor, and computer industries were all underwritten by the federal government, and in particular by the Defense Department in the years 1945-65 (Lecuyer, 2000). The first of the semiconductor firms was Fairchild Semiconductor. It was the first company to produce transistors for semiconductors. The major innovations by the firm during the 1950s allowed the company to gain a large share of military production. By 1960, it was the leading manufacturer of silicon based components in the U.S and its main customer was the U.S. Defense Department. Ultimately, many of the leaders of Fairchild Semiconductor left the firm and went out on their own. They founded many companies in the Valley including Intel. It was these products, which caused the area to become known as Silicon Valley.

The government continued to support research and development and accounted for a substantial amount of the market for high technology goods until the end of the Cold War. They also continued to underwrite most research and development at Universities. During the 1970s and 1980s, the product mix of the Valley began to change. The personal computer, and later the internet meant that consumer markets for goods produced in the Valley were growing very quickly while the market for goods for the Defense Department were either growing less quickly or even contracting.

Most of the stories told about Silicon Valley refer to this period when the government was less in the foreground of development, and more in the background. But, it should be noted that the main product innovations

that went into these new industries had their origins in the postwar Cold War era. Moreover, the reason that Silicon Valley was poised to be such an important player in these new industries during the 1970s was that thousands of engineers were already working there, mainly for firms supplying goods to the defense industry. There has been an explosion of entrepreneurial activity in the Silicon Valley over the past 20 years and an equally explosive growth of venture capital to support this activity. But both of these activities have their roots in the government-funded activities of the postwar era.

But in spite of the important roles that entrepreneurs have played in the past 20 years, the government has played a part. The last of these new innovations, the Internet, owes many of its key features to the Defense Department. An agency in the Defense Department called the Advanced Research Project Agency (ARPA) was founded in the 1960s. It funded the "Arpanet" which was a computer network whose purpose was to create a decentralized network of communication to insure communication in event of a nuclear war. Scientists and university scholars were given access to the “Arpanet” and they used it to send messages and files. In order to make it work better, a series of innovations were necessary to allow for the handling of large amounts of data. This brought forth a number of important software innovations. Most of the basic innovations for these information technologies came from research done in universities where government paid to support the research.

Government support for the computer and electronics industry extends beyond the role of the government as customer and the main organization funding basic research. The Congress has written laws that serve the interests of firms. Patent law and property rights issues have favored the holders of patents. The state of California, for example, has very well developed intellectual property rights laws which, not surprisingly, favor programmers. The Telecommunications Act of 1996 produced rules of competition that is generally favorable to the current incumbent phone and cable firms. These laws have not forced competition between telecommunications and cable companies, but have reinforced the positions of incumbents. Silicon Valley firms have gotten the government to relax immigration laws to provide a stream of engineers, while these same firms simultaneously moved production offshore. As of 2001, commerce on the Internet is not subject to sales tax, giving electronic retailers a 5-7% price advantage over their bricks and mortar competitors. In sum, government is everywhere. It nurtures technologies, allows private exploitation of them, and provides legal and regulatory structures to make it easier for firms to raise and make money. It also allows firms to define the rules of competition.

. This brings me to my second question. Is Silicon Valley really dominated by the networks of actors who are in small firms and cooperate extensively with one another, and does this model produce a stable situation for producers? The main scholarly studies (Saxenian, 1997; Castells, 1998; Castillo, et. al., 2000) seem to think that it is

this feature of the Silicon Valley, which has produced its distinctive competitive advantage. This imagery seems to directly contradict the story I have told about the role of government in supporting innovation and buying products. It also would seem to undermine the idea that large corporations were the primary beneficiary of the government's actions.

I think there are two points of contention here. First, there are many factors that have made Silicon Valley so successful and it is clear that these have changed over time. Thus, it is important to study all of the possible factors and to do it over the whole history of Silicon Valley. So, if one has a 60 year perspective, one can easily see how the Cold War and active entrepreneurs in universities and firms who took advantage of this opportunity formed the core of the industry. It is also important for scholars who study these processes to not ignore all of the potential social factors in the formation of industrial agglomerations like Silicon Valley even if their interest is in what is going on right now. So, if scholars ignore government funding of research and training in universities and do not include it as a cause in Silicon Valley's success, they will not see the government as being important to what is going on. If scholars fixate narrowly on the networks of engineers or the venture capitalists as the engines of success, they will see them as the only social groups relevant to study. Second, having said this, I am not denying that entrepreneurs have had the vision to create new and innovative products that created entirely new industries. I am only denying that they did this on their own, without the aid of government or other institutions.

But I think that the "network approach ignores some of the most compelling industrial organization facts about Silicon Valley. There are already high levels of concentration in the main products produced in the information technology revolution. Microsoft (software), Sun (work stations that power the internet), Cisco Systems (the hardware and switches for the internet), Intel (computer chips), ATT (cable and long distance), and AOL-Time-Warner (internet service provider and cable) control over 60% of their relevant markets. While some of these firms are clear technological innovators, they are also using familiar tactics to control competition. Microsoft, Intel, and Cisco have all been targets of antitrust lawsuits based on forms of predatory competition. The Microsoft antitrust case provided ample evidence that Microsoft behaved like a predatory competitor. As each of these new markets has emerged, a single firm has come to dominate.

It is useful to speculate on what kinds of markets are really being built in these new technology industries. The incumbent firms observe the innovators of new technologies and either buy up or incorporate the insights of those technologies into their main products. They stay in the game by aggressively buying up winners in markets connected to their main products. Microsoft, for example, is well known for approaching small software firms and offering to buy them out. If smaller firms refused, then their products were often re-engineered and made part of the

next release of the operating system. If the incumbents in these industries use their market position to buy out or force out competitors, then what do the challengers do? Challenger firms have a potentially profitable niche strategy available to them. Challenger firms are the innovators who take risks. If they are successful, then they face three potential positive futures (at least from the perspective of their owners): they can go "public" and sell stock, sell out their firm to one of the industry giants, or try and become on of these giants themselves. This is a conception of control that defines the structure of incumbents and challengers. It means that investors have the ability to reap returns if their products are successful and it provides the largest firms with new innovations to keep their large firms in the center of new technology markets. Challenger and incumbents have a symbiotic relation to one another whereby they are competitors, but they also have created tacit rules that allow all to survive.

The issue of "openness" in computer systems and the related problem of creating technical standards for products are complex (Edstrom, 1999). The ability to attach a particular piece of hardware or software to an existing structure makes that structure more valuable. Thus, "openness" benefits the producers of new products and the owners of such standards. The large stable firms update their products and because of the technological lock-in around their standards, they attain stability. "Openness" is one way to get a stable market. I would argue that “openness” evolved when the attempt to create proprietary systems failed. If firms could not control technology markets through patents, then the second best solution was to get their product to be an open standard. It creates stability because it allows industry leader to form and markets to coalesce around stable standards. The core technologies that form the open standard benefit the incumbent firms that control them. Technical standards can operate in a similar way.

If I am correct, then, as the industry develops, we can expect, consolidation into large firms in many of the major products. We can also expect that firms will pursue one of two tactics in the construction of new markets: either be a small, challenger firm prepared to be bought out, or try and become one of the large diversified firms that offer standards for others to build on and buy up new technology to protect their franchise. This conception of control, if it emerges and stabilizes, is the deep structure by which firms will make money. The incumbents are the large firms. The challengers are the small firms where fortunes can still be made, but only as a means to ends. The owners of challenger firms are in the game to cash out.

Conclusions

This paper has taken the view that firms and markets are best viewed as deeply dependent on laws, institutions, and governments for their existence. It is unimaginable that firms could find stable solutions to their problems of competition without extensive social relationships. It is equally unimaginable that many of the products and markets that exist could have existed without the active intervention of governments.

The "shareholder value" conception of the firm was a solution to a particular problem of American firms. They were financially under performing circa 1980 due to the high inflation and slow economic growth of the 1970s. This underperformance was blamed on the managers of firms and financial tools were invented to analyze and transform this condition. The government helped this process along by suspending the antitrust laws and cutting corporate taxes. These actions had the effect of delivering the message that firms should be reorganized along any lines that owners saw fit. The government also deregulated industries and liberalized labor markets. The result was a huge increase in societal inequality. Ironically, the problem of competitiveness of American firms did not go away. American firms failed to recapture markets they had lost in the 1970s and early 1980s. Financially reorganized firms did not make higher profits than their counterparts, but instead aided in transferring wealth from workers to managers and owners. The shareholder value conception of the firm is not the fix for industrial competitiveness that some have argued it is (Jensen, 1989). Instead, it causes firms to focus more narrowly on financial criteria in their decision making and less on strategic matters. Because of the shareholder value conception of the firm, managers that are having problems with a particular product will not work to become more competitive in that product, but instead will divest themselves of that product.

The computer revolution led by Silicon Valley during the 1980s and 1990s appears to be emblematic of entrepreneurial American capitalism. Yet, close examination of the facts, shows that the American government has been intimately involved in funding research, education, and buying the products of the industry for the past 50 years. It has also provided for tax incentives and patent laws that favor producers and investors in risky ventures. But even this has not been enough to stabilize volatile markets for technology products. Firms have found their ways to oligopolies or monopolies whereby innovative firms are selectively absorbed by larger firms. This allows both sides to profit. The founders of small firms are able to take high risks with potentially high returns. The largest firms are able to stabilize their positions by absorbing new technologies.

The lessons typically drawn about the dynamism of the U.S. economy are simple: keep governments and firms apart, make firms compete, and deregulate labor markets. But, hopefully, my short presentation should make the reader question this view. Governments and firms are intimately linked. The relative success of capitalist economies to produce wealth, income, goods and services depends on these linkages. Any account of the success or

failure of the American economy (or any other economy for that matter) that does not take both into account is likely to incomplete at best, and misleading at worse.

Notes

1. Of course, governments do many other things that directly and indirectly help entrepreneurs. They provide for infrastructure like roads, other forms of transportation, utilities, and public safety (including national defense). They also provide for the enforcement of contracts more generally and insure the stability of the financial system. Finally, governments provide social welfare functions.

2. So, for example, the federal government has agreed not to charge sales tax on purchases over the Internet. This policy is supposed to allow the Internet to "mature" as a medium of exchange. But obviously giving electronic sellers a 5-7% price advantage over firms that are "bricks and mortar" is a policy that reflects the interests of one set of sellers over another.

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