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Dennis C. Mueller

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Corporate Governance and Neoclassical Economics

DENNIS C. MUELLER

ABSTRACT *Although the term "corporate governance" is relatively new in the economist's lexicon, the issues with which it is concerned are as old as the profession itself. In this article, first I try to illustrate this, and then I trace the development of the literature, including discussions of the so-called managerial discretion literature and the principal–agent literature. Following a discussion of asset bubbles, I illustrate the tension between concerns about corporate governance and neoclassical economics by examining the literature on managerial compensation and mergers. This literature reveals a wide gap between traditional neoclassical economics and more recent developments in behavioral economics.*

Key Words: Behavioral; Bubbles; Compensation; Mergers; Neoclassical.

JEL Classifications: D21; G01; G34; G41.

1. Introduction

When I was a graduate student in economics, I never encountered the term "corporate governance." Its popular use seems to have emerged over the past couple of decades. One now sees the term used not only in the scholarly literature of economics and business, but also in the popular press. Despite its widespread acceptance as an important topic, much of the literature on corporate governance fits rather uncomfortably into mainstream neoclassical economics, as I will attempt to show.

One can think of corporate governance in two contexts. The first of these is as describing the set of institutions that determine how a corporation is governed – shareholder rights, the rules determining how members of the board of directors are selected, their powers, and so on. A major concern of this strand of the literature is how corporate governance institutions can be

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Dennis C. Mueller, University of Vienna, Oskar Morgenstern-Platz 1, A-1090, Vienna, Austria; e-mail: dennis.mueller@univie.ac.at

designed to align management's incentives with those of the owners of the firm, and the consequences when they are misaligned. Second, one can think of the state's role in governing the corporation – regulations regarding the information corporations must reveal, laws forbidding insider trading, self-dealing and the like, laws concerning mergers and hostile takeovers, and most recently regulations in some countries with regard to managerial compensation. Here, the concern is often to ensure that corporations contribute to the advancement of social welfare, broadly defined. This article will deal mostly with the first category, but mention will also be made of the second.

Although the term "corporate governance" is relatively new in the economist's lexicon, the issues with which it is concerned are as old as the profession itself. I shall try to illustrate this in the next section. I then trace the development of the literature, briefly discussing the so-called managerial discretion literature (Section 3), and the principal–agent literature (Section 4). The tension between concerns about corporate governance and neoclassical economics are illustrated by discussions of the literatures on managerial compensation (Section 6) and mergers (Section 7). Because the issues raised in these sections are closely tied to one's views on the efficiency of the stock market, this issue is discussed in Section 5. Some conclusions are drawn in the final section.

2. Antecedents

2.1. Adam Smith

Adam Smith can rightfully be called the father of economics for it was only after the publication of *The Wealth of Nations* that economics became recognized as a distinct academic inquiry. Smith is celebrated by neoclassical economists today mostly for his championing of free trade and the famous invisible hand theorem illustrating the social gains from market competition. Smith might also be said to have raised the first questions about the governance of corporations or, as they were commonly called at the end of the 18th century, joint stock companies.

> …of such companies … being the managers rather of other people's money than of their own, it cannot well be expected, that they should watch over it with the same anxious vigilance with which the partners in private copartnery frequently watch over their own. Like the stewards of a rich man, they are apt to consider attention to small matters as not for their master's honour, and very easily give themselves a dispensation from having it. Negligence and profusion, therefore, must always prevail, more or less, in the management of the affairs of such a company … It is upon this account that joint stock companies for foreign trade have … very seldom succeeded without an exclusive privilege; and frequently have not succeeded with one. Without an exclusive privilege they have commonly mismanaged the trade. With an exclusive privilege they have both mismanaged and confined it. (Smith (1776) 1937, p. 700)

2.2. *John Stuart Mill*

John Stuart Mill regarded this conclusion as "one of those overstatements of a true principle, often met with in Adam Smith" (1885, 140). Nevertheless, he also thought the principle to be true. After discussing the advantages of joint stock companies, Mill took up "the other side of the question."

> Individual management has also very great advantage over joint stock. The chief of these is the much keener interest of the managers in the success of the undertaking.
>
> The administration of a joint stock association is, in the main, administration by hired servants. Even … the board of directors, who are supposed to superintend the management … have no pecuniary interest in the good working of the concern beyond the shares they individually hold, which are always a very small part of the capital of the association, and in general but a small part of the fortunes of the directors themselves; and the part they take in the management usually divides their time with many other occupations, of as great or greater importance to their own interest; the business being the principal concern of no one except those who are hired to carry it on. But experience shows, and proverbs, the expression of popular experience, attest, how inferior is the quality of hired servants, compared with the ministration of those personally interested in the work, and how indispensable, when hired service must be employed, is "the master's eye" to watch over it. (Mill 1885, 138–139)

2.3. *Berle and Means*

As with many of the arguments contained in *The Wealth of Nations*, much that Berle and Means wrote about the corporation was known at the time they wrote it. But they combined their thesis with an exhaustive history of the evolution of the corporate legal form, and amassed data demonstrating the extent of the separation of ownership from control, and the rise in aggregate concentration that had occurred in the first third of the 20th century. If the dangers of dispersed share ownership forewarned by Smith and Mill were real, the book of Berle and Means suggested that the United States had much to fear.

The bulk of *The Modern Corporation and Private Property* (1932) must have been written in the late 1920s, and thus the book cannot be construed as an account of the collapse of 1929. But the timing of the book's publication could not have been better. The arguments put forward by Berle and Means about the potential for managerial abuse of discretion created by the separation of ownership and control resonated with the thunder of falling stock prices and profits. The handful of examples of abuse of managerial power in the book were duplicated and dwarfed by the accounts appearing daily in the business press. Although the term "corporate governance" had yet to appear, Berle and Means had certainly highlighted some of the issues that would later fall under this heading.

3. The Managerial Discretion Literature

In the late 1960s, the stock market in the United States was soaring, and as always, this stock market boom was accompanied by a merger wave. Unlike previous waves, however, this one was not dominated by acquisitions of rivals in the same industry, so neither increases in market power nor economies of scale could be claimed as a rationale for the mergers. Although when announcing a new acquisition, the managers of the conglomerates, as they came to be called, would mention various unspecified "synergies" that the mergers would create, the rationales behind the mergers remained a bit of a puzzle. I had been impressed by Robin Marris (1964) theory of the corporation in which managers pursued growth rather than profits or shareholder value, and thought that the conglomerate mergers taking place at that time fit his model. I wrote a paper developing this idea, which included a figure showing firms using their cash flows to make acquisitions that were not profitable. (Unfortunately, I failed to label this the use of "free cash flow.") I submitted the paper to the *American Economic Review*. Those were the days when one got one referee report, and it came rather quickly. Mine was a seven-page, single-spaced critique, which ended with something like "Mueller is a bright, upcoming economist. He should cool it." In the late 1960s, to posit that managers maximized something other than profits or shareholder value was to risk being labeled a hot head, on the fringe of the profession.

Nevertheless, change was afoot. In addition to Marris, William Baumol ([1959] 1966) had hypothesized that managers maximized sales, and Oliver Williamson (1963) that they maximized staff and emoluments. Eventual Nobel Prize winner, Herbert Simon (1959), claimed that managers did not maximize any objective function at all, they *satisficed*.

As always happens when such challenges to neoclassical orthodoxy arise, a counter-attack is provoked. Fritz Machlup (1946, 1947) had earlier established himself as a staunch defender of neoclassical economics when he beat down claims by scholars, who had examined how managers actually set prices and argued that they did not do so by equating marginal revenue and marginal cost. Machlup (1967) used the occasion of his presidential address to the American Economic Association to dismiss the work of the managerialists.[1] Marris had gotten his idea about managerial motivation by observing his family firm; Baumol by asking managers how their business was doing; Williamson by observing output and employment swings in corporations. Thus, as in the case of the earlier marginalist controversy about price setting, a critique of neoclassical theory based on observing how firms actually behave was met not with empirical or other hard evidence to the contrary but with a logical argument. Competition would force managers to maximize profits.

4. The Principal–Agent Revolution

In 1973, Stephen Ross published "The Economic Theory of Agency: The Principal's Problem." Principal–agent relationships are ubiquitous (Ross 1973). A traveler gets into a taxi at the airport of an unfamiliar city and hopes to be driven to the hotel over the most direct and cheapest route. But the taxi driver can earn a larger fare by choosing a more circuitous route. An ailing person visiting a doctor hopes that the doctor correctly diagnoses and treats the cause

of his or her illness. The doctor, however, can earn a higher fee by recommending an unnecessary surgical procedure. Each time we entrust our welfare and money to someone we believe to be more knowledgeable than we are, we enter a principal–agent relationship and risk being exploited by the more knowledgeable agent we have chosen.

If we think of a shareholder as being a principal and a manager as his or her agent, then shareholders, because of their lack of knowledge about the detailed operations of the firms they invest in, are vulnerable to the same kinds of exploitation as passengers in a taxi in an unfamiliar city or visitors to a doctor's office. Ross formalized the conjecture of Adam Smith about managers of joint stock companies, and gave a theoretical justification for the hypotheses put forward by Baumol, Marris, and the other managerialists. While much of the profession had treated these latter contributions with skepticism or benign neglect, it embraced Ross's formulation of the principal–agent problem with enthusiasm. The literature it spawned exploded. In their masterful survey of the principal–agent literature, Morck and Yeung (2012) cite 231 books and articles related to the principal–agent problem as it pertains to corporations. The concern of Berle and Means about the consequences of a separation of ownership and control in the large corporation, long dismissed by much of the profession as an outsiders' attack on neoclassical economics,[2] would appear to have now become mainstream. But appearances can be deceiving. I give examples below of parts of the literature that still claim that market competition mitigates agency problems.

Much of the literature on principal–agent problems involving corporations deals with issues of corporate governance – the rights of shareholders, the identities of the shareholders, the size of the board of directors, the independence of members of the board, and so on (Morck and Yeung 2012, 334–348). The nature of corporate governance or principal–agent problems also differs across countries. While large corporations in the United States tend to have widely dispersed share ownership, so control by the board of directors is important for protecting shareholders' interests. In Continental Europe and Asia, large companies are often controlled by a single person or family, and corporate governance issues revolve around the treatment of minority shareholders. The regulatory and legal constraints on managers also differ greatly across countries (see again Morck and Yeung 2012). While hostile takeovers have on occasion been an effective constraint on managers in the United States and United Kingdom, they are relatively rare elsewhere in the world.

I shall illustrate the disagreements about the importance of principal–agent problems in the literature by examining two topics: managerial compensation and mergers. But before that, I discuss the literature on capital market efficiency, since it is relevant for both of the other topics.

5. The Behavior of Stock Prices

5.1. The Behavioral View

Bubbles in asset prices have been around, it would seem, as long as there have been markets for buying and selling assets. One of the earliest and most famous was the tulip bulb bubble in the Netherlands at the beginning of the

17th century. The most recent bubbles have been in US stocks at the end of the 20th century and in housing prices in the United States in the early part of the 21st century. First, I shall review some of the highlights of these bubbles, drawing on Burton Malkiel's (2012) survey, and then I will discuss their causes.

Holland has long been the tulip capital of the world, and in the early part of the 17th century, the Dutch took a fancy for tulip bulbs with a mild virus, which led to flowers with exotic stripes and colors. The price of such bulbs began to rise, and rise, and rise. Tulip bulbs turned from being a source of beauty into an investment, which could make one rich. "At the height of the bubble, in early 1637, a single rare bulb sold for an amount equivalent to the price of a nobleman's castle" (Malkiel 2012, 410). As with all expanding bubbles, it eventually burst, wiping out fortunes and bringing the prices of many varieties down to parity with the price of onions.

Almost a century later, the South Sea Company was founded in the United Kingdom and granted a monopoly over all British trade in the South Seas. It was the kind of joint-stock company about which Adam Smith wrote. From 1717 until 1720, its share price hovered around £100. But then speculation began to build about the profits to be earned in the South Seas and the New World. During the year 1720, the South Sea Company's share price soared to nearly £1,000. By year's end, it was almost already back to £100.

The astounding increase in the South Sea Company's share price gave rise to a phenomenon, which was to repeat itself during the dot-com bubble at the end of the 20th century. Seeing the enormous increases in wealth enjoyed by South Sea's shareholders, entrepreneurs rushed to found new companies and issue shares in the hopes of duplicating South Sea's success. One such company promised to build machine guns that would shoot round bullets for killing Christians and square bullets for infidels (Malkiel 2012, 411).

The Great Crash in US stock prices beginning in 1929 was the mother of all stock market crashes. The Roaring Twenties led many Americans to expect perpetual economic growth and prosperity, and prices on the New York Stock Exchange begin to rise steeply in early 1928. Significant tremors were observed in September 1929. But the sustained collapse began in October of that year.

Malkiel (2012, 413) illustrates the "irrational exuberance" that gripped the market during the late 1920s bubble with the example of closed-end investment company's shares. One might expect their share prices roughly to equal the sum of the values of the shares in their portfolio. In normal times, however, they tend to sell at a discount of around 20%. "From January to August 1929, however, the typical closed-end fund sold at a premium over net asset value of 50 percent" (Malkiel 2012, 413). One such fund run by Goldman Sachs sold at 250% of the underlying value of its assets.

Following its defeat in World War II, Japan became one of the world's great economic success stories. During the 1980s, books and Hollywood movies appeared predicting Japanese economic dominance over the United States and the rest of the world. As occurred in the United States in the 1920s, investors in Japanese stocks appeared to believe that rapid economic growth and prosperity would go on forever. The Nikkei stock market index climbed to 40,000 during the 1980s. Its precipitous decline began in 1990. On May 2, 2017, it was less than half of that value. A similar bubble occurred in the Japanese real-estate market. At its peak, the value of the land upon which the Imperial

Palace stood and its surrounding grounds would suffice for purchasing all of California (Malkiel 2012, 414).

As an example of the pure irrationality that gripped the stock market during the Internet bubble at the end of the 20th century, Malkiel (2012, 409) cites the example of Palm, Inc., maker of PalmPilot. It was 95% owned by 3Com, yet Palm's share price rose sufficiently high to make its total capitalization exceed that of its parent 3Com. The Internet bubble burst in March 2000. By the end of 2002, the market had lost $7 trillion from its peak.

Much has been written about the psychology of traders and the extreme optimism that seems to grip them during stock market booms. John Kenneth Galbraith ([1961] 1972, 8) writing about the crash in stock prices at the end of the 1920s stated that an "indispensable element of fact" during stock market bubbles is that individuals "build a world of speculative make-believe. This is a world inhabited not by people who have to be persuaded to believe but by people who want an excuse to believe."

Just as the US stock market began to crash at the end of the Internet bubble, Robert Shiller published his book, *Irrational Exuberance*, an account of why booms and busts occur in stock and other asset markets. If we think of stock buyers as rational actors, we might expect them to learn from previous stock market booms and busts and not be carried along by a rising tide of emotions and share prices. Shiller explains why this kind of rationality does not win out. Each new wave is accompanied by "theories" as to why share prices should rise to unprecedented levels, why the economy has entered a "new era" (Shiller 2000, ch. 5). In Japan, it was the theory that Japanese managers were superior to managers in other countries, and thus that rapid economic growth would go on forever. At the end of the 20th century in the United States, it was the theory (speculation) that the Internet, and the technological innovations that came with it, would generate tremendous profits in all dot-com companies. Later in this article, I discuss how new "theories" about the economic benefits from mergers contribute to merger waves.

Neuroscience has now provided scientific evidence to account for the irrationality that sometimes grips traders in asset markets. When an individual is given a financial reward, the same part of the brain is activated as when this person consumes cocaine or morphine. During a stock market boom, the financial rewards reaped by buying stocks lead to a kind of addiction, which leads traders to continue buying, even after stock prices reach precarious levels. Conversely, when stocks begin to fall precipitously, a different part of the brain is activated – one associated with fear and pain. Sharp declines in share prices are sometimes referred to as "panics." This is an apt term, since traders' brains are shifted into panic mode as they see their wealth disappearing (Lo 2017, ch. 3).

5.2. The Neoclassical View

For much of the second half of the 20th century, part of the ruling paradigm in the finance literature, as it pertained to stock prices, was the capital asset pricing model (CAPM). It elegantly predicted that the return on an individual company's shares was a linear function of the return on the market portfolio of

all stocks less the risk-free rate of return. The coefficient on the latter variable, β, measured the systematic risk associated with a given company's shares. Knowing this β, movements in a company's share price could be predicted from movements in the value of the market portfolio. The second major part of the ruling paradigm in the finance literature was the Efficient Market Hypothesis. Capital markets were assumed to be *efficient*, in the sense that they used all of the commonly available information about companies to determine share prices. No one without inside information could "beat" the market.[3]

Despite its elegance and widespread use, there was one difficulty with the CAPM, a difficulty that remains today: the model exhibited poor explanatory power when tested empirically. Contrary to the Efficient Market Hypothesis, variables other than the returns on the market portfolio were found to have significant explanatory power.[4] Equally damaging to this hypothesis is that one of its most important implications – the Random Walk Hypothesis – has been resoundingly rejected in empirical tests (Lo 2017, 47–51, 71–74, 167–168).

A few years ago, a leading proponent of the Efficient Market Hypothesis gave a talk at the University of Vienna in which he heavily criticized the growing literature in behavioral finance and economics. At the end of the talk, I pointed out that the average price/earnings ratios of the Standard & Poors 500 (S&P 500) at the end of the Internet stock boom implied that shareholders believed that the profits of an average S&P 500 company would grow at 9.5% *indefinitely*. That, I said, struck me as rather optimistic, given that their average growth rate over the previous century had been around 2%. Nevertheless, our guest's faith in the efficiency of the stock market remained unshaken.

In 2013, Eugene Fama won a Nobel Prize in economics for his work developing and applying the CAPM. In the same year, Robert Shiller, a—if not *the*—leading critic of the Efficient Market Hypothesis, also won a Nobel Prize. You pay your money, and you take your pick. Whether one accepts this hypothesis will turn out to be important in the evaluation of the market for managers and the market for corporate control in the next two sections.

6. Managerial Compensation

The literature on managerial compensation can also be broken down into two broad segments, which we shall again label as the neoclassical and behavioral views.[5] The neoclassical view sees the often astronomically high compensation packages received by CEOs and other top managers as the outcome of a competition for their talents by boards of directors of large corporations. The market for top managers is efficient and operates like any labor market. The alternative view postulates the existence of considerable managerial power over boards of directors when it comes to designing compensation contracts. CEOs nominate people to serve on their boards, often serve on other boards, and have considerable control over their own boards. To a large extent, top managers write their own compensation tickets.

Most studies of managerial compensation focus on rather recent time periods. An important exception is that of Frydman and Saks (2010) who examined managerial compensation in 50 large companies going back to 1936. They found that managerial compensation was "remarkably flat" from the end of World War II until the mid-1970s. Much of this period might be called the

"Golden Age of American Capitalism." Companies grew large, as did their profits. The Dow Jones went from 152.58 on January 2, 1945, to 947.73 on January 3, 1969. Why did competition for talented managers during these prosperous times not drive up managerial compensation proportionally? Even more puzzling to some extent is why managerial compensation began to rise during the "lost decade" of the 1970s, when the Dow Jones fell from 947.73 to 824.57 on January 2, 1980.[6] Managers began enjoying higher pay at a time when their shareholders were experiencing wealth losses.

In 1992, average CEO pay for firms in the S&P 500 was about $2.5 million. By the year 2000, it had soared to roughly $12 million (Conyon 2012, 378). This dramatic increase suggests a remarkable increase in competition for managers during the 1990s, if the neoclassical view is valid.

Gabaix and Landier (2008) explain increases in managerial pay by increases in the size of corporations. Today, a CEO of an S&P 500 firm must manage far more assets than 40 years ago. With more wealth at stake, competition for talent to manage this wealth drives up compensation. This explanation for the growth in managerial compensation treats firm size as exogenous. In developing his theory of managerial pursuit of growth, Marris (1964, ch. 2) stressed the relationship between firm size and managerial compensation. Managers have an incentive to expand their firms, even when it destroys shareholder wealth, because of the private benefits – among them higher compensation – that they receive. Mergers are the fastest way for a firm to grow, and as we shall see in the next section, there is considerable evidence that this form of expansion – however beneficial to the managers – does not always benefit their shareholders. Indeed, managers are often rewarded for consummating big mergers. For example, in 2016, Charter Communications acquired Time Warner for $65 billion. Charter's board of directors rewarded its CEO, Thomas M. Rutledge, with a stock option that raised his total compensation from $16.4 million to $98 million (Goldstein 2017).

Murphy and Zabojnik (2004) make a somewhat different argument for why the market for managers has driven up their pay. In the first years after World War II, top managers typically rose up through the company they would eventually lead. The CEO of a steel company knew the steel business and the inner workings of his or her own company. Their knowledge was largely firm-specific, and thus other companies were unlikely to bid for their services, thereby driving up their pay. Murphy and Zabojnik argue that more general managerial talents such as knowledge of finance and accounting are now in greater demand, and they present evidence that appointments of CEOs from outside the company have increased in recent years. One reason why managers with more general knowledge may now be in greater demand is that firms are considerably more diversified than they were immediately after World War II. Here, the argument encounters a similar difficulty as the previous one. Diversification typically is achieved through mergers, and diversification mergers are the least likely to be profitable. Indeed, several studies have estimated "diversification discounts." The market value of a diversified company is less than the sum of what its divisions would be if they were stand-alone companies. One often-cited study found the diversification discount to be 13–15% (Berger and Ofek 1995). Hoechle et al. (2012) link the size of the discount directly to poor corporate governance.

As with the CAPM, the explanatory power of models to explain executive compensation is often very weak. Estimates of models using data from before the 1990s predominately found the size of a company to be the most significant variable explaining managerial compensation. The link between compensation and shareholder wealth was weak or nonexistent. In one famous study, a $1,000 increase in shareholder wealth led to a $3.25 increase in the CEO's compensation (Jensen and Murphy 1990). This changed in the 1990s, however, as pay packages shifted toward stock options and other devices linking managers' and shareholders' wealth. This shift explains much of the fivefold increase in average managerial pay from 1992 to 2000, as managers benefitted greatly from the booming stock market during that period. Did the change in incentives facing managers lead them to emphasize shareholder wealth to a greater extent? Did this *cause* the stock market boom? Alternatively, did managers recognize that a stock market boom was afoot and convince their boards of directors to change their pay packages so that they could ride the stock market on its way up?

This section has raised enough questions to cast some doubt about the market-for-managers view explaining all of the recent history of executive compensation. We turn next to another literature, which is composed of divergent views of the world.

7. Mergers

Every stock market boom in the United States, since stock markets there have existed, has been accompanied by a wave of mergers. If one accepts the view of the behavioralists—that stock market rallies are fueled by overoptimism—then it is reasonable to assume that some of this overoptimism spills over into the concurrent merger wave and precipitates ill-conceived mergers. Jesse Markham, in an early survey of the merger literature, made this observation about the first great merger wave in the United States.

> The literature provides convincing evidence that the abnormally large volume of mergers formed in 1897–1900 stemmed from a wave of frenzied speculation in asset values. Several students of the early merger movement agree that the excessive demand for securities was an impelling force in the mass promotion of mergers after 1896 (Markham 1955, 162).

Robert Shiller, writing about the same period, describes one of the "theories" that underpinned the stock market rally:

> The most prominent business news in the papers in recent years had been about the formation of numerous combinations, trusts, and mergers in a wide variety of businesses, stories such as the formation of U.S. Steel out of a number of smaller steel companies. Many stock market forecasters in 1901 saw these developments as momentous, and the term *community of interest* was commonly used to describe the new economy dominated by them. (Shiller 2000, 101, italics in original)

Shiller quotes an editorial in *The New York Times* from April 1901, which prophesizes that the U.S. Steel merger will avoid "much economic waste" and effect "various economies coincident to consolidation." It predicts similar benefits from mergers in railroads. Such optimism explains why U.S. Steel's share price soon soared to $55 from the $38 it was floated at in 1901. By 1903, it had plunged to $9 (*Economist* 1991, 11).

Overoptimism was apparent in the merger wave of the late 1960s. During this wave, the so-called conglomerates undertook a series of diversification mergers. Each new merger announcement was greeted by an increase in the conglomerate's share price. One explanation for this given in both the popular and academic literatures, and yet another example of one of the spurious new "theories" that accompany stock market booms, was that the conglomerates were engaging in "P/E magic."[7] Because of the market's optimism, conglomerates traded at P/Es as high as 30, roughly double the long-run average at that time. A conglomerate would announce that it was acquiring, say, a food company, with a P/E of 10. The food company's low P/E obviously suggests that the market anticipated slower future earnings growth than for the conglomerate. Upon the merger announcement, however, the market would reevaluate the earnings of the food company using the conglomerate's P/E. Thus, if the food company had earnings of $15 million and a market value of $150 million, these earnings would create $450 million in value for the conglomerate, easily allowing it to profit from the purchase of the food company, even after paying a handsome premium for its shares. The conglomerates' P/E magic of the 1960s resembles the kind of Ponzi scheme that Shiller (2000, 64–66) claims characterizes all stock market bubbles.

Numerous studies have attempted to measure the effects of mergers on the profitability of the merging firms. The methodology employed typically compares the changes in profitability of the merging firms from before and after the mergers to the changes for some control group of non-merging companies. In a recent survey, I identified three studies for the United States that reported significant increases in profitability for the merging firms, one with some changes positive and others insignificantly different from zero, and five with profit changes either significantly negative or insignificantly different from zero. Two studies for the United kingdom reported profit changes equal to or above zero, two insignificantly different from zero, and two more significantly less than zero. Four studies of mergers in Japan all reported no changes or declines in profits for the merging firms. Nine other studies for countries ranging from Australia to Sweden also tend to find modest changes in profits at best, with declines outnumbering increases (Mueller 2012, 428–433).

While studies of the effects of mergers on profitability paint a mixed picture, their effects on the sales and market shares of the merging firms are unambiguous and striking. Of the 18 studies of the effects of mergers on sales or market shares that I identified, *none* reported a significant increase; 12 reported significant declines (Mueller 2012, 434–437).

Declines in sales could be expected for mergers that increased market power, since the merging companies would take advantage of their gain in market power by raising prices. But such mergers should also lead to increases in profits. In a large multinational study, my colleagues and I found that only around 30% of the mergers were accompanied by profit increases and sales

declines. Another 30% exhibited increases in both sales and profits, suggesting increases in efficiency due to the mergers, while a roughly equal number had declines in both sales and profits, implying decreases in efficiency (Gugler et al. 2003). Thus, a majority of mergers in our sample showed (often insignificant) increases in profits following mergers. If market power increases are judged to be welfare reducing, a majority of the mergers were also welfare reducing.

By far the largest literature on the effects of mergers consists of event studies in which changes in share prices for merging firms are compared in various ways to changes in the value of a portfolio of other companies' shares. Early contributions to this literature often reported large positive abnormal returns for acquirers for long periods leading up to the merger announcement, and subsequent declines beginning immediately or with a short lag. An obvious interpretation of this pattern would be that the relative rise in the acquirer's share price before the announcement led to the merger, and the merger itself caused the subsequent decline. A behavioral theory consistent with the first half of this conjecture is discussed below. The interpretation just given was not generally the one provided by the authors of the early studies, however. One even dismissed the relative decline in the acquirers' share prices after the mergers as "puzzling" (Asquith 1983).

Perhaps to avoid reporting such puzzling results, many later event studies of mergers only reported abnormal returns for short "windows" around the merger announcements, for example two days before and after the announcements (Maquieira, Megginson, and Nail 1998). These studies generally found small and insignificant abnormal returns for the acquirers. Because large premiums had to be paid to the acquired companies' shareholders to consummate the deals, event studies using short windows typically concluded that the mergers were wealth creating – acquired firms' shareholders gained, the acquirers' shareholders did not lose.

There are two difficulties with this interpretation of these findings. First, although one can justify ignoring the post-announcement losses to acquirers' shareholders over long time intervals by invoking a strong form of the Efficient Market Hypothesis, ignoring them does not make them go away. In an important article, Agrawal, Jaffe, and Mandelker (1992) investigated what seemed to be an anomaly from the perspective of the Efficient Market Hypothesis – the losses to acquiring firms' shareholders over long time periods following the mergers. They estimated the abnormal returns to acquirers' shareholders over the five years after the mergers. For the entire sample period, 1955–1987, they were a significant –10%. Interestingly, the only sub-period exhibiting positive returns was the lost decade of the 1970s (4.1%, statistically insignificant), a time period over which investors did not appear to be overly optimistic.

Some scholars discount the findings of Agrawal, Jaffe, and Mandelker and other studies estimating returns over long post-announcement windows on the grounds that other events occurring after the announcements introduce "white noise" into the estimates. This is certainly true, but if the white noise is randomly distributed, its effect will be to reduce the standard errors of the estimates, making it less likely to find significant estimates. The large and *significant* estimates found by Agrawal, Jaffe, and Mandelker are thus even more impressive when one allows for the appearance of white noise.

The second difficulty with findings of insignificant returns to acquirers near to zero involves its implication regarding the motives of the acquirers' managers. Mark Sirower and I estimated a mean loss for acquirers' shareholders of –$50.7 million over the two years after the mergers, roughly 2% of the acquirers' pre-merger market values. The standard deviation around this mean was $1,892 million, however – 37 times the size of the loss (Mueller and Sirower 2003). Such large standard deviations of returns are common in event studies of mergers, and they raise the question of why managers, who are ostensibly maximizing the wealth of their shareholders, undertake such risky investments with negligible expected returns. An obvious answer is that most of the money at risk does not belong to the managers.

Before closing this section, I wish briefly to discuss two other behavioral theories of mergers. Richard Roll, a distinguished finance scholar, also was puzzled by the losses acquirers' shareholders suffered following mergers. Rather than assume them away by invoking the Efficient Market Hypothesis, he offered a theory of managerial behavior to explain the losses (Roll 1986). Roll's theory envisaged mergers occurring following a bidding war among potential acquirers. Such bidding wars often result in "the winner's curse," the price of the sought-after object rises above the object's intrinsic value, and the winner of the auction winds up losing. Given the long history of mergers, one might expect experienced managers to avoid entering into such bidding contests. Roll accounts for this behavior with the claim that many managers of acquiring companies suffer from *hubris*. They know the odds against a successful merger are high, but they believe that they can beat the odds because they are better than other managers at spotting value in other companies.

As discussed above, during a stock market boom, many firms' share prices rise to such levels that they appear to be overvalued. Moreover, the findings of Asquith (1983) and others indicate that the share prices of acquiring companies rise even faster than those of the market portfolio during the months leading up to an acquisition. Shleifer and Vishny (2003) explain this pattern of price movements with the hypothesis that managers of acquiring firms often recognize that their shares are overvalued and choose to trade them away for real assets. Thus, their theory also explains the post-merger losses to acquirers' shareholders: the market recognizes the overvaluation and corrects its mistake. If the theory of Shleifer and Vishny is correct, it not only offers an explanation for merger waves and their consequences, it also invalidates the use of invent studies to measure the effects of mergers. If some companies' shares can be overvalued, others can be undervalued. The share price increases enjoyed by the targets of mergers may not represent real synergies caused by the mergers, but merely price adjustments correcting the market's earlier mistakes. In a world of over- and undervalued shares, the meaning of "abnormal returns" is difficult to discern.

Without knowing what the managers of acquiring firms were thinking at the time of an acquisition, it is difficult to choose among the behavioral theories of mergers discussed here. Did the acquirers' managers anticipate the losses to their shareholders but went ahead anyway so that they could enjoy the pecuniary and non-pecuniary benefits from managing a larger firm? Did they out of hubris mistakenly expect the acquisitions to be a success, or did

they seek to benefit their shareholders by unloading some of their companies' overvalued shares?

What is not at question, however, is that shareholders of acquiring firms suffer substantial post-merger losses for mergers undertaken during stock market booms. Leeth and Borg (1994) estimated post-merger losses to acquirers for acquisitions during the 1920s stock market boom (1925–1930) of almost 24%. Langetieg (1978) estimates losses of >26% for mergers during a time period ending in the peak year of the 1960s boom (1969). Loderer and Martin (1992) estimated post-merger abnormal returns for acquirers over several different time periods. They reported only one significant estimate: –61.2% for mergers during the 1960s stock market boom (1966–1969).[8] Burcin Yurtoglu and I estimated wealth losses to acquirers for mergers during the 1990s stock market rally of –19% (Mueller and Yurtoglu 2007). Moeller, Schlingermann, and Stulz (2005) reported wealth losses of –12% for mergers taking place during this rally (1998–2001), a figure that destroyed $240 billion in acquiring firms' shareholders wealth. For mergers taking place outside of these years, the losses to acquirers were only 1.6%.

8. Conclusions

Competitive markets often seem to be guided by an invisible hand. Moreover, the economist's model of supply and demand, based on the assumption that buyers and sellers are rational actors, can be used to predict price movements. A bumper crop of apples leads to a decline in their price. A tariff on apples produces a price increase.

Apples come in many varieties, so too do tulip bulbs. The behavior of the Dutch tulip bulb market in the 17th century demonstrates that even a market for a seemingly mundane commodity such as tulip bulbs can go haywire. The evidence that stock market bubbles are driven in part by similarly irrational behavior is compelling. The fact that stock market booms are inevitably accompanied by merger waves suggests that many mergers occurring during these periods are likely to be driven by considerations other than the maximization of shareholder welfare. The huge increases in compensation that managers experience during stock market booms also seems difficult to justify as rewards for actions that they took that led to their companies' share price increases.

Andrew Lo recounts an experience he endured as a second-year assistant professor in 1986. He had been invited to present a paper at an NBER conference, and chose to present a paper coauthored with another assistant professor, A. Craig MacKinlay. The paper was an empirical test of the Random Walk Hypothesis. Their data resoundingly rejected a key implication of the hypothesis, casting doubt not only on the robustness of the Random Walk Hypothesis, but also on its underlying premise – the Efficient Market Hypothesis. Lo's discussant was a senior scholar in the field of finance, who proceeded to tear apart Lo's paper. The authors had obviously made a programming error, which produced the incongruous results (Lo 2017, 47–51). In 1986, young people working in the finance area did not challenge the Efficient Market Hypothesis.

When reading Lo's discussion of the incident, I was reminded of the referee report I received as an assistant professor at Cornell University, castigating me for claiming that managers might sometimes pursue a goal other than profit maximization. I had the advantage, however, of *reading* the pillorying of my work in private. Lo had to endure it in front of a room full of distinguished scholars.

The literature has come a long ways since the late 1960s and 1980s. The vast literature on principal–agent problems makes a religious adherence to the premise that managers always maximize profits seem untenable. The rise of behavioral finance provides a viable alternative to the orthodoxy of the Efficient Market Hypothesis and its antecedents.

Or does it? We have seen in this article that proponents of the Efficient Market Hypothesis are alive and well. Since the stock market is efficient, the losses to acquiring companies' shareholders in the years following the acquisitions can be ignored. "The market for corporate control" ensures that any managers who did not maximize shareholder wealth or were paid excessively would have their companies taken away from them. Indeed, since capital markets, the market for executives, and the market for corporate control all work efficiently, one wonders why anyone should even be concerned about corporate governance. *Markets* govern.

In this article, I have highlighted a couple of areas in which a behavioral perspective appears to be needed to understand how markets work and why they sometimes violate the predictions of neoclassical economics. In closing, I shall point out two additional areas where the assumption that individuals are always or even usually rational seems untenable.

For many children, their first exposure to a deck of cards is the game of Old Maid. In Austria and Germany, it takes the form of the politically incorrect Schwarzer Peter. As a child grows older, it moves on to games of war, hearts, and eventually poker and other card games where gambling takes place. We have seen that achieving a financial reward stimulates the part of the brain that is also activated by consuming cocaine and morphine. Gambling can become addictive. Recognizing this, the operators of casinos in Las Vegas and elsewhere have programmed slot machines to reward players occasionally with a jackpot of coins (Schüll 2012). Slot machines used to be operated by pulling a lever – hence their nickname of one-armed bandits. Watching gamblers pull the levers of slot machines once reminded me of the thirsty rats in B.F. Skinner's laboratory that pushed levers to get a reward of some water occasionally. (Today, slot machines are operated by pushing buttons, much faster and less tiring.) In extreme cases, gamblers become so addicted to the machines that they bankrupt themselves and destroy their lives and those of their immediate family. The exploitation of slot machine players by the casinos comes straight out of Psychology 101. An Economics 101 textbook would be of little use in explaining this patently irrational behavior.

Much of my research has been in the field of public choice – the application of economic modeling to politics. Voters are rational actors choosing candidates or parties to maximize their expected utility from government programs. Interest groups are collections of people with homogeneous preferences who maximize their expected utilities by contributing to candidates who will vote for legislation that benefits the interest group. Candidates promise and vote for policies to maximize their

expected votes, and so on. Bryan Caplan has challenged the assumption that voters are rational actors by using survey evidence to show that many voters have biases, which cause them to vote for policies that actually do them harm (Caplan 2007). The vote by the British in 2016 to leave the European Union seems hardly rational; the same could be said of the vote by Americans in the same year that elected Donald Trump president. Both votes strike me as examples of *expressive* voting. Many voters in the United Kingdom and the United States simply wanted to express their anger or disenchantment with mainstream politics and politicians.[9]

Thomas Kuhn (1962) famously observed that paradigm shifts in the sciences do not come about because adherents to a given paradigm were persuaded by logic and empirical evidence to abandon it in favor of a new paradigm. A paradigm shift arises when newly minted scientists, considering the logic and empirical evidence in favor of the reigning paradigm and its challenger, opt for the latter.

Paul Samuelson (1947) can be said to have caused such a paradigm shift with the publication of *The Foundations* in 1947 (Lo 2017, 206–213). When I entered the Princeton graduate program in 1962, for the first time, graduate students in economics were required to pass tests demonstrating proficiency in mathematics and one foreign language. Prior to that year, tests in two foreign languages were administered. If anything, Princeton was a bit slow in making this move. By the end of the decade, all major economics departments were requiring proficiency in mathematics and were offering courses in "mathematics for economists."

The spread of mathematics in economics allowed economists to construct elegant theories, which made precise predictions – theories such as the Efficient Market Hypothesis and CAPM. Because the predictions are often very precise, they sometimes have been rejected by the data. I have discussed some examples in this article. One reason why rigorously derived economic theories are rejected is that they are built on false premises – rational consumers maximize utility, rational managers maximize profits or shareholder wealth, rational investors intelligently weigh risk and returns when purchasing shares, and so on.

The rise of behavioral finance and more generally behavioral economics in recent years suggests that another scientific revolution may be afoot.[10] One can imagine in a few years economics departments requiring their graduate students to pass tests in psychology and neuroscience.

Notes

1. See also Baldwin (1964) and Peterson (1965).
2. As late as 1982, at a conference held ostensibly to "celebrate" the fiftieth anniversary of the publication of *The Modern Corporation and Private Property*, the tenor and tone of the papers presented reveals that many came not to praise the book but to bury it (see special issue of *Journal of Law and Economics*, June 1983).
3. For a good description of the Efficient Markets Hypothesis and its development, see Lo (2017, ch. 1).
4. For an early discussion and references to an already burgeoning literature, see Reinganum (1981).
5. See discussion in Conyon (2012) and references to the literature.

6. https://www.fedprimerate.com/dow-jones-industrial-average-history-djia.htm, accessed May 10, 2017.
7. For an account of the hypothesis by an academic, see Mead (1969).
8. For additional discussion and references, see Mueller 2003, ch. 9).
9. For a discussion of expressive voting, the rational voter hypothesis, and still other hypotheses about voter behavior, see Mueller (2003, ch. 14).
10. See, Shleifer (2000), Thaler and Sunstein (2008), and Lo (2017) and works cited therein.

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