CHAPTER 12

MARKET EFFICIENCY: A
SOCIOLOGICAL PERSPECTIVE

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INTRODUCTION

The primary purpose of this chapter is to sketch a sociological approach to the question of market efficiency—that is, whether financial market prices accurately reflect the “intrinsic” or “fundamental” value of financial assets. The approach advanced here, which is based on my prior work (principally, Zuckerman 1997: ch. 4, 2004, 2008a, 2008b, 2010; Zuckerman and Rao 2004), and builds on certain heterodox strains in finance research (see especially, Derman 1977; Graham and Dodd [1934] 1940; Keynes [1936] 1960; Miller 1977; Shiller [1990] 1993, 2005; Thaler 1993), integrates three perspectives on social valuation generally and financial market pricing in particular: (a) the “realist” perspective, represented by the efficient market hypothesis (EMH), which holds that financial markets are both allocatively and informationally efficient due to the processes of arbitrage and learning that swiftly eliminate any mispricings; (b) the “pure constructionist” perspective, captured most famously by Keynes’ ([1936] 1960) image of a speculation-driven market as a beauty contest, whereby prices bear no relation to intrinsic value; and (c) the “contrarian” perspective, which is best represented by value investors (Buffett 1984; Graham [1949] 1973; Graham and Dodd [1934] 1940; Williams [1938] 1956) who direct investors to opportunities that can be exploited by discerning short-term gaps between price and value. I argue that each of these perspectives is based on sound principles, but that each has important weaknesses. I sketch an integrative approach that carries three main lessons: (a) asset prices are governed by theories of value that translate economic indicators into price; (b) specific institutional conditions are required for weak theories to be replaced by stronger theories, thereby leading to a more (but never fully) efficient market; and (c) an understanding of these institutional conditions—in particular, the need for a vehicle for effectively communicating the full
range of opinion and reaction to material information—is critical to guide policy on how financial markets should be constituted and regulated.

But before sketching this approach, it is important first to clarify why sociologists should even care about the question of financial market efficiency. Indeed, while recent years, and especially the last decade, have seen sociologists and sociologically inclined scholars direct a surge of attention to financial markets, few have directly engaged with the question of market efficiency. This avoidance reflects one of two implicit stances toward the EMH.

The first stance seems prevalent among those economic sociologists who came to economic sociology from the sociology of organizations, and who have generally adopted an oppositional attitude toward the discipline of economics. This set of scholars regards the EMH as rooted in a broader ideology of free markets and a commitment to rational action, one that does clear violence to reality. The second stance seems common among those who arrived at the sociology of finance from science and technology studies (STS) and political economy (see, e.g., MacKenzie, Muniesa, and Siu 2007). For such scholars, the very question of market efficiency is problematic because they tend to favor a pure or strong version of social constructionism, one that is at best uncomfortable with the notion that there are objective constraints on the reality that human beings construct for themselves. Thus, whereas the first set of scholars dismisses the question of market efficiency because the answer seems obviously “no,” the second orientation is loath to admit it as an appropriate question for sociological inquiry. Instead, such scholars prefer to focus on the question of whether economic theories such as the EMH have self-fulfilling or “performative” properties, such that its widespread adoption makes it more accurate (see Mackenzie 2006: ch. 9). The net result is the same: with the exception of myself, sociologists have had little to say about the extent to which financial markets are efficient and the conditions that make them more or less efficient.

And yet, there are five interlocking reasons why sociologists should care about the question of market efficiency. The first is straightforward. Just as political sociologists should be informed by, and engaged with, work by political scientists, and historical sociologists should be informed by, and engaged with, research by historians, sociologists of finance should be fully informed by, and engaged with, financial economics—that is, the primary field of inquiry that attempts to understand financial markets. And the question of market efficiency is the axis around which research in financial economics revolves (see Fox 2009; Jovanovic, this volume). Indeed, while financial economics had long been stultified by near-universal fealty to the EMH, the field has recently become much more interesting, as debates between orthodox and heterodox opponents rage. Research in the sociology of finance is necessarily impoverished if it is not informed by such debates, and especially if it caricatures the literature out of ignorance of current work.

The second reason for sociologists to care about the question of market efficiency is that an inquiry into this question affords a more productive way to understand the conditions under which economic theories may be “self-fulfilling” or “performative” (terms I will henceforth use interchangeably), and when they are not. A social theory may be
said to performative when: (a) its predictions do not depend on actors’ awareness and endorsement of the theory; (b) its predictions turn out to be accurate—that is, the theory is predictive; and (c) the theory is predictive not due to the assumptions and logic that constitute the theory, but because the actors in fact became aware of the theory and endorsed it in action. It has long been known that both lay and professional social theories can have self-fulfilling qualities (for classic statements, see Merton [1948] 1968; Merton 1995). However, two challenges have hampered progress in understanding the conditions under which theories are performative: (i) to distinguish those predictive theories that are in fact performative from those predictive theories that are not performative because they fail either criterion (a) or (c) above; and (ii) to understand why many theories that are widely adopted fail to be performative.

In light of these challenges, an investigation into the fate of the EMH appears quite promising. It is useful to compare the EMH with the most widely cited example of a performative theory— that is, the Black-Scholes-Merton (BSM) theorem for pricing options (see Mackenzie 2006; Mackenzie and Millo 2003). The BSM is in fact not a good test case for performativity due its failure to satisfy both criteria (a) and (c). The BSM fails criterion (a) because it was in fact not written as a prediction of how markets would look absent the adoption of the theory. And the BSM fails criterion (c) because it is impossible to rule out the possibility that it eventually came to predict option prices due principally to the soundness of the assumptions and logic upon which it was originally based (see Mackenzie 2006: 20). By contrast, the EMH satisfies criterion (a) since it was stated as a prediction of reality when it was first articulated (see especially Fama 1965a). Moreover, the EMH went on to have significant influence on finance practice—most notably, in the widespread adoption of indexing and in the training of hundreds of thousands of MBAs. And yet there is significant doubt as to whether it was predictive, and no evidence whatsoever that the widespread endorsement of its tenets and tools had any effect on its accuracy. As such, it is an excellent negative case for helping us to understand why even prominent economic theories often fail to fulfill themselves.

The third reason why we should care whether, and under what conditions, markets are efficient is that this is the key question that necessarily animates policy debates on the governance of financial markets. Especially given the havoc they often wreak, we as a society could choose not to have financial markets. The primary reason for continuing to support such markets is the belief that capital-allocation decisions are more efficiently made via the price mechanism than by a more managed process. The basis for such a belief is surely some version of the EMH—that is, the expectation that capital will seek out the projects that promise the highest returns, and will run from the projects that promise the lowest returns. And it seems plain that anyone who invests her personal portfolio in financial assets and securities is driven by similar expectations. Who among us would put their money in securities (or vehicles such as mutual and pension funds that invest in such securities) if we thought that securities prices were just as likely to be high (low) on projects that promised low (high) returns as vice versa? Of course, financial market prices sometimes do seem to be unjustifiable, and this may lead investors to take their money out of the market. But even if we might sometimes endorse such a
withdrawal by individual investors, it is highly problematic to advocate for mattresses as the place where society as a whole should put its cash. Capital that is taken out of circulation means lower economic growth, and fewer jobs. And insofar as society as a whole has a need for capital markets, such markets should surely be the most efficient possible, such that capital flows to the most productive activities. And this then makes salient the question of which conditions promote and limit market efficiency.

The recognition that public support for securities markets depends on at least a measured belief in market efficiency leads to the fourth reason why sociologists should engage with the question of market efficiency: the core logic underlying the EMH is so clear and compelling that it needs to be incorporated into any account of how financial markets work. Accordingly, I next turn to laying out the logic of the efficient market hypothesis. And yet while this logic is compelling, it is limited. I thus turn next to laying out the opposing logic, which holds that financial markets are constructed in “self-recursive” fashion, such that prices can become quite distant from intrinsic values. But we will see that this logic is limited as well and that, ironically, such constructionism shares key weaknesses with the realism of the EMH. To advance a more robust account, I then draw on principles of value investing, which are quite useful for clarifying where value and price meet but need to augmented with elements of the first two perspectives to explain why they often do not meet. We will then arrive at an account of financial markets, the efficiency of which depends on particular institutional and social conditions.

And this account will be useful in fulfilling the fifth and primary reason that sociologists should care about market efficiency. In particular, while framed in terms of a setting that has not been the subject of sustained sociological inquiry, the question of market efficiency cuts to the core of a general sociological problem: What are the limits and possibilities for the social constructive projects to which human beings devote themselves? To what extent are our myths and institutions “castles in the air” or are they firmly anchored in “objective reality”? Financial markets are an excellent setting for addressing these questions because, at least after the fact, it is possible to compare projects with the reality they purport to represent (see Zuckerman 2012; Zuckerman and Rao 2004: 208–9).

THE EFFICIENT MARKET HYPOTHESIS: LOGIC AND DIFFICULTIES

Logic of the EHM

To summarize the logic of the EMH (see especially Brav and Heaton 2002; cf., Fama 1965a, 1970, 1976, 1990; Malkiel 1985, 2003; Shefrin 1996), it is useful to focus on the webUrl case of the stock market, and specifically the case of common (as opposed to
preferred) stock. But the same logic will apply, mutatis mutandis, to other securities markets. To begin, let us first recall that, as in any market, price reflects a balance of supply and demand; in particular, the price for an undifferentiated commodity or asset is determined by the marginal demander (the least interested among current buyers who thus requires a low price to buy the good) coming to terms with the marginal supplier (the least efficient among current suppliers who thus requires a relatively high price to serve the market). However, securities markets are distinct in that (at least theoretically) investors can switch roles between buying and selling at any time. Indeed, the institution of “short selling” or “shorting” allows any investor to sell stock even when he does not own it (by borrowing from current owners at the current price, and returning it later, hopefully after having bought it back at a lower price). As such, we may say that prices are determined by the actions of “marginal investors”—that is, that class of investor for whom a price higher than the current (ask) price is too high for him to invest, and a price lower than the current (bid) price is too low for him to sell. There may, of course, be investors who think that the price is already too high at the current price, and those who think the price is too low, but the selling of the first group and the buying activity of the second group will balance each other out, such that the marginal investors tip the balance. In fact, one of the implications of the EMH is that there is no meaningful disagreement among investors as to the value of securities, and, as a result, all investors are marginal investors. This is a troubling implication (see Miller 1977; Shleifer 1986), since it is quite evident that there is substantial disagreement among investors (see Kandel and Pearson 1995; Kandel and Zilberfarb 1999; Zuckerman 2004).

But let us continue by laying out the logic of the EMH and why it generates this and related implications. First, consider how (marginal) investors decide whether they want to buy or sell stock. Since there is little or no use or consumption value from owning them, rational investors will buy and sell shares based on expected returns. And the EMH assumes that, in the first instance, such returns are determined by the earnings that accrue to the owners of the stock, where such earnings are discounted by time (earnings received in the near term are worth more than those received in the distant future) and risk (more certain earnings are worth more than those that are subject to some doubt). This focus on the income stream is logical because shares in a corporation legally entitle the owner to a proportionate share in the income that it generates, as well as a proportionate vote on such corporate decisions as how much of the income should be reinvested in the firm’s operations and how much should be disbursed to shareholders as income. All things being equal, investors should be willing to pay more for shares that can be expected to earn their owners more income.

Note, however, that the fact that investors are willing to pay more for more expected income does not mean that investors should invest in high-income rather than low-income stocks. This will depend on their relative prices. It is in fact possible for investors in high-income stock to earn lower returns than do investors in low-income stock if the relative prices of the stock are such that the former investors are effectively paying more, per dollar of expected income, than the latter. At any point in time, there is an effective going rate in the market for a dollar of expected income, and a rational investor should
be unwilling to pay above this rate to acquire an asset (and he should be unwilling to sell an asset for below this rate). Of course, such an investor should be thrilled to pay below this rate. That is, if an investor believes that the price per dollar of expected income is low for a given stock, he should go ahead and invest in the stock. Conversely, if she believes that the price is high relative to expected income, she should (short) sell it. In either of these cases, the investor should be able to profit from the difference between price and “intrinsic” or “fundamental” value.

But the EMH argues that such profit opportunities effectively do not exist—or if they do, they are extremely fleeting, such that prices at any given moment can be assumed to be the best estimates of intrinsic value. The key reason is that insofar as these profit opportunities are substantial, they produce a powerful incentive to find and take advantage of these opportunities, by buying or selling the asset to the point that the gap between price and value, and the corresponding profit opportunity, is eliminated or “arbitraged away.” Indeed, since the EMH assumes no capital constraints, the actions of just a small minority of “smart-money” arbitrageurs are sufficient to make markets efficient. Moreover, this arbitrage process also stimulates a learning effect, in that the type of underpricing that the arbitrageur recognized becomes less common (see especially Brav and Heaton 2002). The main reason for this is that we can expect other investors to observe the arbitrageur’s success, and to infer that they should adopt his approach to interpreting information about the security. Moreover, if some investors stubbornly cling to inferior methods of valuing the security, we can expect these dullards to suffer from capital erosion, such that they are effectively weeded out of the market, and only the smart money remains.

Finally, the EMH takes this logic to its ultimate conclusion and predicts that the great returns available to potential arbitrageurs have the effect of eliminating them from the get-go. That is, given the incentives for correctly valuing securities, we can expect the arbitrage and learning effects to operate in rapid fashion, such that all investors are marginal investors and all marginal investors are smart-money investors who drive the current price to be the best estimate of the stock’s value, given available information. Accordingly, while an investor may be able to profitably invest on the basis of private information, it is folly to invest on the basis of public information. This would imply that the investor denies the arbitrage and learning effects, and, by inference, that he thinks that investors are not interested in the profit opportunities that come from exercising arbitrage. In colloquial terms, such an investor is assuming that there is free money lying around and that despite the fact that millions of other investors are in exactly the same position to see and profit from picking up this money, they refrain from doing so. The EMH thus counsels investors to assume that they are wrong and the market is right, and to resign themselves to passive investment strategies, such as buying market indexes.

**Difficulties with the EMH**

In 1978, Michael Jensen famously asserted that financial market efficiency was the best established empirical fact of economics (Jensen 1978: 1). The development of modern
portfolio theory (Markowitz 1952; cf., Roy 1952), and the capital asset pricing model (CAPM; Black 1972; Lintner 1965; Sharpe 1964; Treynor 1965), each of which relied on market efficiency to guide investment decisions, had a powerful impact on the practice of investing as well. Hundreds of thousands of MBAs have been trained in the methods and wider doctrine of the EMH, and the wider public absorption of the EMH’s lessons may be seen in the proliferation of passively managed index funds, which concede the futility of stock picking, and merely try to mimic broad indexes such as the S&P 500 (Bernstein 1992). And yet, by 1990, Eugene Fama conceded that “capital markets are almost surely inefficient” (Fama 1990: 1). Telling blows to the EMH have come from many quarters, and have included a series of demonstrations claiming that the CAPM is an ineffective valuation tool (see Fama and French 2004); various empirical “anomalies” whereby stock returns are predictable for particular periods of time (see Keim 1988; Jovanovic, this volume, for review); substantial evidence that the stock market is excessively volatile (see Shiller 1990); and evidence that there is substantial difference of opinion among investors (Kandel and Pearson 1995; Kandel and ZilberfARB 1999), thus increasing trade and volatility (Zuckerman 2004). And perhaps the most awkward issue for the EMH has been the recurrence of asset bubbles (and subsequent crashes), during which it is demonstrable that prices substantially exceed intrinsic value (see e.g., Ofek and Richardson 2002; Shiller 2005).

Note as well that two prominent defenses of the EMH by long-term adherents can be quickly dismissed. One such defense is Fama and French’s (2004) attempt to save the EMH from embarrassing empirical results, whereby the CAPM’s measure of “beta” (the covariance of an individual security with the market index) failed to predict returns (see also Jovanovic, this volume) while simple measures of size and underpricing (market-to-book; see below) succeeded. Fama and French interpret these results as indicating that the latter measures are better measures of risk than the CAPM’s. The problem is that this is bald assertion: there is no evidence that investors who buy smaller stocks or undervalued stocks face greater risks. Rather, these results are reasonably interpreted as consistent with the value-investing perspective to be discussed below.

The second prominent defense in some sense contradicts the first because it asserts that the EMH is validated by the fact that markets exhibit so few arbitrage opportunities, such that even professional investors are hard-pressed to make money from stock picking. This is a serious mistake in logic because accepting the EMH is not required for one to believe that it is difficult to beat the market. Indeed, this will be true even if one believes that prices are completely random. Moreover, for the EMH to be valid, it is crucial that if and when a mispricing does somehow emerge, it will be quickly exploited, and thereby eliminated. But consider Malkiel’s (2003) review of the state of the EMH, which was written in the aftermath of the Internet bubble. Malkiel, who was one of the great popularizers of the EMH (Malkiel 1985), concedes that “the stock market may well have temporarily failed in its role as an efficient allocator of equity capital” and that “an argument can be maintained that the asset prices did remain ‘incorrect’ for a period of time.” Yet he regards it as a point in the EMH’s favor that “there were certainly no arbitrage opportunities available to rational investors...
before the bubble popped” (Malkiel 2003: 75–6). In fact, this cuts to the core of the problem for the EHM: a scenario where investors have taken collective leave of their senses is precisely when the EMH expects arbitrageurs to act. It is the absence of arbitrage in such cases as the Internet stock bubble and the recent housing bubble that represents the most vexing challenge for the EMH. Why indeed do arbitrageurs not emerge to eliminate such gaps between price and value? And if they do not emerge, how can we expect markets to be efficient?

**Implications for performativity**

Before addressing this question and thereby building a more robust account of market efficiency, it is useful to return to the issue raised earlier—that is, the implications of the EMH’s failure for performativity theory. One obvious implication is that even when a theory is expounded by prominent economists and then widely adopted, it may not be performatative. Past work on the performativity of economic theories does not venture an explanation for why a widely adopted theory may be performatively in one case but not others (see especially Mackenzie 2006: 248–58). In the present case, the issue may be that whereas performativity theorists seem to assume that the widespread adoption of a theory necessarily makes it more predictive, theories such as the EMH actually require *limited* adoption to be predictive. This point is related to Grossman and Stiglitz’s (1976, 1980) famous observation that if prices reflect all available information, there are no incentives to collect information; they argue that as a result, information collection stops short of the point where full information is gathered and, as a result, markets are less than fully efficient. My point here is a slightly different one, and pertains to the counterfactual situation where all investors would come to believe in the EMH. Regardless of whether prices are in fact the best estimates of intrinsic value, they are assumed as such by all investors in this counterfactual world. As a result, it is irrational for them to engage in arbitrage. And if no one is engaging in arbitrage, prices have no anchor in intrinsic values. At that point, the EMH suggests that there should be great (if fleeting) arbitrage profits to be made, but such profits are available only to those investors who do not believe in the EMH. So if all investors believe in the EMH, the market cannot be efficient.

The general lesson for research on the self-fulfilling properties of social theories is that the wide adoption of a theory will *undermine* its predictive power insofar as the internal logic of the theory implies that actors who aware of it and endorse it will act counter to the theory’s assumptions about their behavior. And as far as the EMH is concerned, it is perhaps a small comfort to its proponents that their failure to convert everyone (including themselves) helps to make it more valid! But, more importantly, the recognition that the EHM is a self-defeating theory helps to reinforce our question. Insofar as such arbitrage opportunities as those presented by the Internet stock or housing bubbles do present themselves, why do investors not exploit them and thereby make markets more efficient?
THE SELF-RECURSIVE MARKET HYPOTHESIS AND
THE LIMITS OF VALUE–PRICE ARBITRAGE

Logic of the SRMH

I now present the most prominent answer to this question and then show that it too suffers from an important weakness. This answer may be summarized by the famous quote attributed to Keynes: “The market can stay irrational longer than you can stay solvent.” Put more concretely, Keynes’ point is that “it is not sensible to pay 25 for an investment of which you believe the prospective yield to justify a value of 30 if you also believe that the market will value it at 20 three months hence” ([1936] 1960: 157). Keynes argues that the investor who buys on the basis of income or yield—that is, the smart-money arbitrageur upon whom the EMH depends—is essentially an anachronistic throwback to the period before shares in corporations were securitized. Once equity is securitized and it trades on large, liquid exchanges, the marginal investor necessarily becomes a speculator who must focus first and foremost on changes in the “conventional valuation” (and therefore, price) over his speculative horizon. This logic leads to Keynes’ famous metaphor of the stock market as a “beauty contest.” In particular, he likens speculative markets to:

…those newspaper competitions in which the competitors have to pick out the six prettiest faces from a hundred photographs, the prize being awarded to the competitor whose choice most nearly corresponds to the average preferences of the competitors as a whole; so that each competitor has to pick, not the faces that he himself finds prettiest, but those he thinks likeliest to catch the fancy of the other competitors, each of whom is looking at the problem from the same point of view…. We have reached the third degree where we devote our intelligence to anticipating what average opinion expects the average opinion to be…([1936] 1960: 156)

Two points are worth stressing. First, this “self-recursive” logic (see Zuckerman 2004) critically undermines the logic of the EMH. As discussed above, the logic of the EMH relies on the incentives inherent in the profit opportunities that emerge when prices deviate from intrinsic value. But Keynes (and more recent observers who recognize the limits to arbitrage; see DeLong et al. [1990] 1993; Shleifer and Vishny 1997) points out that this is not the case. If you think the price is wrong but the marginal speculator does not come around to your opinion within your time horizon, you will not in fact earn profits even if in some objective sense you were right. To return to the example of the Internet bubble, short sellers lost a great deal of money at that time because the very nature of short selling, which requires interest payments and the posting of more collateral when prices increase, meant that they could not sustain their position long enough to benefit from the eventual downturn. Indeed, several famous investors were forced
from the market because they stubbornly clung to the value-based methods that were objectively right, but were wrong for all practical purposes.

Second, it is important to recognize that what might be called the “self-recursive market” hypothesis (SRMH) is not based on irrational behavior. Rather, “it is an inevitable result of an investment market described along the lines described” (Keynes [1936] 1960: 157). Insofar as the proximate determinant of price movements is changed in the marginal speculator’s valuation, it is at least as sensible to speculate on the basis of trends in speculator opinion as on calculations of expected income. As Keynes notes, “He who attempts… investment based on genuine long-term expectation… must surely run greater risks than he who tries to guess better than the crowd how the crowd is going to behave; and given equal intelligence, he may make more disastrous mistakes” ([1936] 1960: 157). Moreover, the case for focusing on one’s fellow speculator is often stronger for institutional investors—that is, the smart money assumed by the EMH to act as arbitrageurs. In particular, insofar as institutional investors such as mutual fund or hedge fund managers are agents who compete for investment, it is not enough that they have the fortitude to bet against the market; they must also convince their investors to believe in their contrarian ideas, and to keep the faith when the market turns against them. As Keynes put it, “Worldly wisdom teaches that it is better for reputation to fail conventionally than succeed unconventionally” ([1936] 1960: 158; cf., Scharfstein and Stein 1990). Surely this is too strong: after all, the unconventional success is often celebrated. The problem though is that the unconventionality comes before the success, and one often has to answer for it well before success can be validated.

**Difficulties with the SRMH**

Yet while the logic of the SRMH successfully undercuts that of the EMH, it too suffers from significant limitations such that on its own it is an even weaker guide to the question of efficient markets. Note first that the fact that value—price arbitrage (or more generally, “valuation opportunism”; see Zuckerman 2012) is difficult does not mean that it is easy to engage in the kind of speculative arbitrage described by Keynes. While the EMH may be wrong to think that the mechanism of arbitrage eliminates all gaps between price and value, there is every reason to think that it operates quite well when it comes to gaps between current and future price. Keynes suggests that it is good strategy to speculate on the basis of trends in the conventional valuation. But insofar as there are great returns available to any speculator who correctly anticipates such trends, it is reasonable to expect great efforts to be made in this direction, such that any gaps between current price and anything that is foreseeable in such trends will be arbitraged away! This reinforces the point that one need not endorse the EMH in order to think that arbitrage opportunities are scarce. The problem then is that both the EMH and the SRMH are *recipes for inaction* on the part of investors/speculators. The EMH insists that opportunities to arbitrage between price and value are mirages because they are eliminated instantaneously. The SRMH undercuts this argument by showing that how risky it is to try to
speculate on the basis of intrinsic value. But insofar as we assume rational behavior, the SRMH is equally problematic due to the fact that speculating on the basis of conventional opinion cannot work on average.16

This recognition leads to an even deeper and more problematic commonality among these hypotheses, and the larger perspectives on social valuation that they represent. The EHM is an example of a pure realist perspective, in that it contends that social valuations accurately reflect objective values. Like performativity theory, the SRMH is an example of a pure constructionist theory, in that it insists that social valuations have no effective anchor in objective values (see, e.g., Westphal and Zajac 2004, and see also Zuckerman 2004b, 2004c). Realism and constructionism are typically thought to be opposing perspectives (see, e.g., Abbott 2001). But as I have recently argued (Zuckerman 2010), they have exactly the same implications as guides for action generally, and for public policy in particular. Consider recent financial asset bubbles. Federal Reserve Chairman Alan Greenspan was rightly criticized for letting his belief in efficient markets prevent the Fed from acting against asset bubbles. But pure constructionism provides no more basis for intervention in such circumstances than pure realism:

The pure realist regards dominant interpretations as the best possible, thereby renouncing responsibility for challenging them or proposing alternative mechanisms for arriving at such interpretations. By contrast, the pure constructionist has no particular affection for dominant interpretations. But neither does she have a basis for challenging them or suggesting alternative arrangements since she believes all interpretations to be equally (in)valid. Were the pure constructionist to prefer an alternative to the dominant interpretation, how might she argue for it? How might a performativity theorist diagnose a bubble? (Zuckerman 2010: 364)

The differences and similarities between pure realism (represented by the EMH) and pure constructionism (SRMH), as well as their point of intersection, are summarized in Figure 12.1. While the former sees prices as governed by intrinsic values, the latter emphasizes collective beliefs. But they share the implication that markets do not exhibit meaningful gaps between price and value. For the EMH, the reason is that such mispricings are arbitrated away. For the SRMH, the reason is that intrinsic value is a fiction or at best a theoretical construct with no bearing on price. Yet it is worth stressing the third reason I gave regarding why sociologists should care about market efficiency. In particular, while our response to the EMH has often been to label its adherents as naïve realists who do not appreciate that the market is socially constructed, this response begs two questions: (a) Does that mean that prices bear no relationship to intrinsic value? (b) And if not, what is the basis for public support for securities markets? This basis would appear to derive from the belief that prices will be reasonably accurate signals to guide capital allocation. But this will not be so insofar as prices are pure constructions with no anchor in intrinsic values. And this in turn makes the first question more urgent. Let us rephrase it as follows: Given that arbitrage between price and value is severely limited by the self-recursive nature of speculation and the understandable reluctance of institutional investors to buck convention, how and to what extent do prices relate to intrinsic values—and what can we do to tighten that link?
The logic of value investing

We begin to formulate our answer to this question by turning to a contrarian perspective which, as depicted in Figure 12.1, combines the EMH’s emphasis on value-price arbitrage with the SRMH’s recognition that market dynamics are driven by speculative behavior disconnected from intrinsic value. This essence of this “value-investment” approach of Graham and Dodd ([1934] 1940; cf., Graham [1949] 1973; cf, Fisher 1996; Williams [1938] 1956) is captured by the following parable:

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**Contrarian**
(Value-Investor)

- *Principle 1:* Prevailing valuations can be judged against, and are shaped by, objective conditions
- *Principle 2:* Prevailing valuations are shaped by subjective factors
- *Principle 3:* No actionable difference between prevailing valuations and objective value

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**Pure Realist**
(EMH)

**Pure Constructionist**
(Keynes’s Beauty Contest; Pure Performativity)

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**FIGURE 12.1** Three Perspectives and Three Principles on Social Valuation and Financial Market Pricing

Each vertex in this three-dimensional plot (see Coleman 1964; Martin 2009) is a perspective that embraces each of the principles described on the adjacent edges. For instance, a pure realist perspective holds both that objective values ultimately govern prices and that there is no difference between price and value. The edges drawn from one vertex to an opposing side indicate that the perspective on the vertex rejects that particular principle. Thus, the pure realist position rejects the principle that subjective factors shape prices.

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**THE ATTRACTIONS AND CHALLENGES OF CONTRARIANISM**

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The logic of value investing
Imagine that in some private business you own a small share that cost you $1,000. One of your partners, named Mr. Market, is very obliging indeed. Every day he tells you what he thinks your interest is worth and furthermore offers either to buy you out or to sell you an additional interest on that basis. Sometimes his idea of value seems plausible and justified by business developments. Often, on the other hand, Mr. Market lets his enthusiasm or his fears run away with him, and the value he proposes seems to you a little short of silly. If you are a prudent investor or a sensible businessman, will you let Mr. Market's daily communication determine your view of the value of a $1,000 interest in the enterprise? Only in case you agree with him, or in case you want to trade with him. You may be happy to sell out to him when he quotes you a ridiculously high price, and equally happy to buy from him when his price is low. But the rest of the time you will be wiser to form your own ideas of the value of your holdings, based on full reports from the company about its operations and financial position. (Graham [1949] 1973: 108)

Note that Graham and Keynes both make sharp distinctions between speculation and investment, and they agree that prices are driven by the marginal speculator (“Mr. Market”) whose valuations often appear disconnected from intrinsic value. However, Graham draws very different conclusion from this. In particular, whereas Keynes counsels against engaging in value—price arbitrage (but see note 16), this is exactly what Graham advocates. He insists that the “true investor” should make up his own mind about the value of a security and act when he disagrees with the marginal speculator, and that he will do “better if he forgets about the stock market and pays attention to his dividend returns and to the operating results of his companies” ([1949] 1973: 109). And there is good evidence to suggest that when practiced in a disciplined way, value investing can be quite profitable as an investment strategy (e.g., Buffett 1984; cf., Fama and French 2004). Note finally that a compelling reason for sociologists to take this perspective seriously is that, despite the appeal of constructionism to many economic sociologists, they in fact adopt a contrarian posture whenever they argue for the value of sociology relative to economics (of their own work relative to someone else’s). Such a stance suggests that objective values do indeed exist but that social valuations are often wrong, such that we would be wise to keep our own counsel.

Difficulties with value investing

Yet while this ad hominem framing of the matter may make us root for contrarianism, it also underscores the difficult questions it faces. Consider first how the doubts SRMH raises regarding value–price arbitrage generally also apply to the value investor: if Mr. Market is so silly, why is the value investor so sure that Mr. Market will ever correct himself, so that the value investor earns a profit (rather than loss)? Graham and his followers do not provide a clear answer to this question. Graham has often been quoted as saying that “In the short run the market is a voting machine. In the long run it’s a weighing machine,” but he provides very little guidance as to the mechanisms
that make Mr. Market reflect foolish popular fads in the near term but wise trends in the long term. Graham ([1949] 1973: 108) provides five reasons for this “adjustment process” but they are all essentially assertions that Mr. Market figures things out eventually rather than explanations for why this is the case. Moreover, if it is unclear why value investing escapes the critique from the SRMH, it is also unclear how it escapes the EMH’s argument that the incentives from the profit opportunities identified by value-investment strategies should lead (via the arbitrage and learning effects) to their swift elimination. The value-investment approach thus faces a double bind, as illustrated in Figure 12.1 by how it shares key principles with each of the other perspectives. On the one hand, it enjoins the investor to engage in arbitrage, the profits of which are realized because the market eventually learns the intrinsic value of the security; but on the other hand, the arbitrage opportunities it identifies can exist only if arbitrage and learning are limited. We are thus back to our question as formulated above.

Toward a Sociological Answer to the Question of Market Efficiency

In the remainder of this chapter, I sketch an answer to this question. I begin by recognizing the wisdom embedded in the practice of value investing and the contrarian orientation in general, if not in the (relatively undeveloped) theory of markets espoused by value investors. An appreciation for this practice helps to: (a) clarify how value–price arbitrage is possible, thus limiting self-recursive processes and providing an objective foundation for prices; (b) indicate the limits to value–price arbitrage, and thus how prices may deviate from intrinsic values; and (c) suggest significant limitations to the market as a learning environment (and thus its capacity for “weighing” correctly in the short term), with such limitations being very severe under certain institutional conditions (when trading is over-the-counter).

Value–price arbitrage sets an objective price floor

The main lesson from the practice of value investing is that securities prices are not pure social constructions, but are constructed within specific objective constraints. In particular, prices face a hard lower bound or “floor” below which they do not go. To see this, one must only consider the main strategy recommended by value investing, which is search for stocks that are so low priced that they are trading at a market value that is considerably less (with a “margin of safety”; Graham and Dodd [1934] 1940) than the expected income or, what is even better, a market value that is less than the value of the firm’s assets. In particular, let us consider a counterfactual scenario, whereby the shares of General Electric (GE) common stock at the opening of trading on September 13, 2010,
were being offered for $1 per share. Since there were 16.9 billion shares of GE common stock outstanding, this would entail a market value of $16.9 billion. This may sound like a large number, but it in fact would represent a 90.1 percent decline from the closing price of $15.98/share (implied market value of $171 billion) on the prior day of trading, which was September 10, 2010. And yet, according to the pure constructionist logic of the SRMH, there is no reason to think that the $1 price is wrong and no reason to think that speculators are more apt to keep prices near $16 rather than push them down to $1. But in fact, there is very good reason to think that the $16 price is a more accurate estimate of GE’s intrinsic value, and that this speculators will realize this and incorporate it into their trading activity, thus keeping price much closer to $16 than to $1.

To support this assertion, I first use two classic value-investing methods to establish that the $1/share is too low: (a) dividend yield (see especially Burr Williams [1938] 1956)—that is, the income that an investor can expect to receive from owning GE stock; and (b) liquidation value—that is, the income that an investor would obtain via a “fire sale” (i.e., as immediate as possible) of its assets. To be sure, many public corporations do not disburse dividends and none are required to do so. However, these concerns are largely irrelevant for the exercise of determining the intrinsic value of GE. In particular, while the size of the GE dividend has varied over the years, it had (as of September 10, 2010) a decades-long unbroken streak of disbursing quarterly dividends. And despite a recent cut in the dividend, GE had kept its dividend payout ratio constant at about 45 percent of earnings, which suggests that it had the capacity to fulfill its commitment. The value of this commitment may be calculated by noting that the quarterly dividend to be disbursed on October 25 to all those who own their shares on September 16, 2010 (the “ex-dividend date”), was $0.12. This means that for a counterfactual investor who purchased a share for $1, GE stock would yield a quarterly return of 12 percent and a yearly return (assuming no compounding) of 48 percent. This is, of course, an extremely attractive rate of return. Even at $10/share, the quarterly dividend of $0.12 represents an annual yield of 4.8 percent that compared very favorably with the 2.8 percent yield on ten-year US Treasury bills. By contrast, at the going price of $16/share, the yield to the GE investor was just a bit higher than the investor of the ten-year Treasury-bill—3 percent. These calculations strongly suggest that GE’s intrinsic value was much closer to $16/share than to $1/share.

This conclusion is greatly reinforced when we consider GE’s liquidation value (see especially Graham and Dodd [1934] 1940). The liquidation value of a stock is relevant due to the following logic: should an investor acquire a controlling interest in the company, this is the minimum return that she can expect to obtain from her investment. In reality, such an investor is likely to expect a much higher return insofar as the assets are worth more as part of the business than they would be in a “fire sale.” Thus, an investor valuing GE for its takeover value is also likely to arrive at a price considerably higher than $1. One basic and very conservative approach to calculating liquidation value, based on GE’s June 2010 balance sheet, subtracts its total liabilities from its total assets minus intangible assets, and also takes a 25 percent discount to receivables (i.e., assumes that 25 percent of what is owed to GE will not be collected) and a 50 percent discount to
inventories (i.e., assumes that in a fire sale, its products would be marked off by an average of 50 percent). This calculation results in an estimate for GE’s intrinsic value of $5.33/share. A still more conservative method would remove the estimated value of GE’s goodwill. Even this method, which effectively assumes that GE’s brand name has no value, generates a liquidation value of $1.60/share or $27 billion, which is 60 percent higher than GE’s price under our counterfactual scenario.23

The foregoing calculations strongly suggest that while GE’s intrinsic value may not be as high as $16/share, it is much higher than $1/share. And there is also good reason to think that these calculations of intrinsic value shape the price of GE’s shares. Let us be very precise about what we mean when we say that intrinsic value “shapes price,” especially since the two perspectives that share this principle (see Figure 12.1)—the “pure realism” represented by the EMH and the “contrarianism” represented by value investing—differ quite radically on whether mispricings occur in the short term. What unites these perspectives is the idea that there is a very conservative calculation of intrinsic value that establishes a floor below which prices are extremely unlikely to fall. Concretely, and if we assume that there is no material information about GE or the political and economic condition that affects its income-generating capacity over the weekend of September 11–12, 2010, this implies that the chance of GE’s shares being offered for a price as low as $1/share is equivalent to the chance that someone will dump a billion dollars onto Times Square that same morning, and that this cash will still be there a few hours later. Such a scenario is physically possible, but socially impossible. Indeed, we routinely organize our lives by assuming away scenarios that are much more socially possible (e.g., that we will be attacked by a mugger as we walk down the street) than this one. You, dear reader, would not wager anything that has value to you on the chance that it might occur.

It may be difficult for some sociologists (especially those who tend toward pure constructionism) to accept that there is an infinitesimal chance of GE shares trading as low as $1/share, such that the price of $16/share is a more correct price. But two considerations should defuse such skepticism, and also provide a foundation for grasping how such calculations shape price. First, my rendering of the principle that intrinsic value shapes prices pertains only to the prediction that prices will not decline below the most conservative calculations of intrinsic value. That is, my claim is not that prices equal value, but that as prices decline further and further, there is some very low calculation of intrinsic value below which they will not fall. Second, this value-based price floor operates even if many—even the vast majority of—investors do not endorse my calculations. All that is required for a calculation of intrinsic value to establish a price floor is that those who endorse this calculation have sufficient capital to purchase the shares from those who are willing to sell at this price. If even one investor has sufficient capital, it is rational for him to buy the asset because, by his own estimation, he will earn an attractive return from ownership of the asset regardless of whether he is the only person in the world who thinks this—and it is rational for him to continue to invest until the point that either the price of the asset rises to equal his calculation of intrinsic value or he runs out of capital to invest. Thus the prediction that there is essentially no chance that GE shares will not trade as low as $1/share on September 13, 2010, is essentially a prediction that
there exists at least a minority of investors who have, or can raise, sufficient capital to buy all shares that are offered at such a price.  

Theories of value shape construction

The foregoing discussion suggests how we can recast Keynes’ insights in such a way that the self-recursive nature of speculation is still anchored—if often loosely—in intrinsic value. To see this, consider a speculator who is trying to anticipate trends in the “conventional valuation” and thus anticipate GE prices. At $16/share, this is a very difficult challenge. But it is not very difficult in our counterfactual scenario. Indeed, the foregoing discussion essentially placed us in this very scenario, which is essentially the second “degree” cited by Keynes. That is, at $1/share, it seems very easy to anticipate that someone will step in and buy GE shares due to their recognition that they can make a very good income by owning them. As such, if I can buy some shares at $1 before those investors can snap them up, I stand to enjoy great returns as demand from such investors pushes up the price. Thus, the closer prices are to conservative estimates of intrinsic value, the more speculators’ judgments of conventional valuation are shaped by calculations of expected income. It is at this low point that the two rational imperatives—(a) to invest by comparing price to expected income; and (b) to speculate based on trends in conventional valuation—come together because it is clear how calculations of income enter the conventional valuation. And if a speculator persists in foolishly ignoring the fact that prices are too low, the mechanisms of arbitrage and learning ensure that he will either be eliminated from the market as he loses his money to value investors, or that he will learn from value investors that he must do calculations of expected income if he wants to anticipate price trends—at least when prices are very low.

And this same logic, by which estimates of income shape judgments of conventional valuation, also applies when prices are higher than conservative estimates of intrinsic value. Let us recall why a long-term investor who cares only about income—that is, as opposed to a speculator—might ever be willing to pay a price for shares in a venture that is much greater than conservative estimates of its intrinsic value (e.g., based on its current income or the value of its assets). Clearly, such investors often lose their money from making such bets. However, they are sometimes rewarded quite handsomely insofar as the venture has a strategy for creating value and capturing it, thereby accumulating substantial profits. That is, such an investor acts on the basis of a “theory” that relates indicators about the firm and its environment to produce a judgment about the value of a share in such a venture (see Shiller [1990] 1993; Zuckerman 1997, 1999). And the recognition that such theories inform investment should again shape our thinking—as well as that of the speculator who is trying to anticipate conventional valuations. That is, insofar as we think that a great deal of capital believes in a theory that values a venture at price $p$, it will make sense for us to consider buying shares if for some reason the price declines below $p$. And to return to our GE example, we may very well decide to buy GE shares at $13/share if we feel strongly enough that the dominant theory in the market implies that...
GE should be worth $20/share. Such speculative strategies were frowned upon by Graham because they rely on successfully anticipating short-term trends in prices (by contrast, Buffett has often invested on this basis; see Lowenstein 1996). But the key point for our perspective is that this logic sheds light on how estimates of intrinsic value enter even into speculative behavior. Again, the speculator who tries to ignore fundamental value is in for a rude awakening when he discovers that the trend that he anticipated runs counter to what most speculators believe that most believe...about the theory of value that governs the asset in question.

Theories and prices are relatively unconstrained at the top

To this point, there is much about the EMH that I have endorsed. In particular, I have argued that the mechanisms of arbitrage and learning discipline speculators, such that they cannot push prices too far from prevailing theories of value as applied to available information, and these theories are in turn attempts to estimate future income streams. This suggests that prices should be good estimates of these income streams, and thus efficient guides for the allocation of capital. But the rub is that while the mechanisms of arbitrage and learning operate to ensure that the theories of value that govern pricing are reasonable (i.e., based on estimates of future income) and that they improve with time, such theories are often quite wrong in the short term. For instance, the Internet bubble should not be seen as a spate of irrationality or speculation on the basis of sheer momentum. Rather, Internet-stock price movements suggest that they were governed by a theory of value that was reasonable, but turned out to be wrong (see Zuckerman and Rao 2004; cf., Demers and Lev 2001).

There are two interlocking reasons why incorrect theories can govern prices for a time, and these reasons derive from fundamental limitations to arbitrage and learning. With respect to arbitrage, the problem is that while value–price arbitrage becomes easier and easier as prices drop in value, it becomes effectively impossible as prices rise. When prices are very low, the value investor can exercise arbitrage by buying the corporation outright. Others may have a theory that values the shares at this very low price, but their opinion no longer matters: the value investor makes his return directly from the firm’s income stream, not from anticipating the conventional valuation. By contrast, there is no comparable way to execute a contrarian strategy when prices are very high. To return to the example of the Internet bubble, the only option available to them was to short sell Internet stocks. But even when short selling is possible (and it generally was not possible because so few Internet shares were available to borrow; see Ofek and Richardson 2002), the short seller is at the mercy of conventional valuations—that is, of the prevailing theory of value—and to paraphrase the paraphrase of Keynes, “the market can cling to an incorrect theory longer than you can stay solvent.” Accordingly, Graham and Dodd ([1934] 1940) urge value investors to avoid short selling except in the rare circumstance where they can hold their position indefinitely. And the relative absence of value–price arbitrage at high prices has the indirect effect of loosening the upper bounds on price.
Once speculators believe (that speculators believe…) in a particular theory of value, and this theory implies a much higher price, there is relatively little that a value investor can do to profit from their folly, and thereby bring prices down to a reasonable level.26

I now turn to my final point, which concerns the weakness of the market as a learning environment. To motivate this issue, it is first worth noting that the weakness of value–price arbitrage at high prices does not necessarily mean that prevailing theories will always be wrong. In particular, insofar as wrong theories are eventually debunked (once sufficient time passes, and estimates of income turn out to have been too high), bad theories are replaced with good theories. And given enough observations, only good theories remain.

The problem with this, of course, is that there are never enough observations. History never repeats itself in exactly the same way, and this provides the impetus for new theories to emerge for interpreting these new developments. Further, there is always someone (something of a “valuation entrepreneur”; see Zuckerman 2012; cf. Becker 1965) who has an interest in promoting the theory that the new developments will be extraordinarily lucrative. Usually such theories are not taken up by others, but sometimes they are, and the rising number of adherents can generate great momentum. At that point, skeptics may try to counteract the speculative fever by suggesting that the theory is silly and/or that the historical record provides reason to doubt it. But the theory will often seem reasonable enough to enough speculators (who reinforce one another’s sense that it is reasonable) and the historical record will be sufficiently ambiguous (see Reinhart and Rogoff 2009), such that massive amounts of capital may be wasted on relatively low-income projects before the new theory is debunked.

Note finally how the weakness of value–price arbitrage both enables and exacerbates such speculative excesses. It enables such bullish speculation because those with the correct theory of value can do nothing (apart from short selling in the hope that they will time the crash well) to counteract it. And second, their very absence from the market means that speculators will derive incorrect lessons from short-term market movements (see Gorton 2008). For example, consider a situation where news arrives that has ambiguous implications according to a dominant but incorrect bullish theory of value, but has negative implications according to the correct bearish theory of value. Such news may lead to a short-term spike in trading and volatility as speculators attempt to judge the conventional valuation of such news (cf., Zuckerman 2004). But since the bears have little or nothing to do to act on their views, speculators will reasonably judge that the news was not particularly negative. Moreover, if the bears express their views in the public media but there is no corresponding effect on prices, speculators will reasonably conclude that the market has judged them to be wrong. In sum, the weakness of the market’s capacity for supporting value–price arbitrage has the side effect of distorting the market’s capacity to effectively communicate the distribution of opinion. And the net result is that insofar as such limits on arbitrage apply, securities markets will be limited in their allocative efficiency (i.e., prices will not be the best estimates of future income) and even in their informational efficiency (i.e., they do not incorporate the full range of opinion about available information; cf., Sethi 2010; Zuckerman 2004a).
CONCLUSION

I have tried in the foregoing to sketch a sociological account of market efficiency that navigates between the extreme realism, as represented by the EMH, and the extreme constructionism that is represented alternatively by performativity theory and the SRMH. In short, the perspective advanced here is an elaboration on Graham’s mantra that the market is a “voting machine” in the short run, but a “weighing machine” in the long run. This elaboration has suggested how and why intrinsic values constrain prices, but also how and why those constraints are weak. I hope that this perspective provides a stronger foundation for the efforts by sociologists and others who seek to understand how it is that markets can often be such marvelous ways for a mass of individuals to make wiser decisions than they would make on their own, but sometimes foster colossal errors of judgment. And future efforts should be motivated by the desire to minimize the latter episodes and maximize the former. This can be accomplished only when we realize that prices are neither pure constructions nor exactly right, but are the outcome of collective processes of profit-seeking (arbitrage) and communication (learning) that depend on well-working institutions to make sure they work reasonably well, if never as well as one might hope.

I conclude by noting two implications for the appropriate stance we should take toward market efficiency. First, a recognition of the limits of market efficiency directs us to how they can be “rationalized” to become more efficient (Zuckerman 2010). In particular, regulators must work to ensure that: (a) there are mechanisms for the full range of investor opinion to be expressed; and (b) in the event that a securities market lacks such mechanisms, they should regard the market as structurally inefficient and intervene to address its problems before they produce negative repercussions for the financial system, and even the economy.

However, even while we attempt to make markets more efficient, market efficiency will always be limited. The reason is that there is no escaping the fundamental asymmetry, whereby bulls can invest on the basis of the asset’s expected income and without regard to market risk (thus producing a hard price floor), whereas bears are always at the mercy of market risk (thus rendering a ceiling of straw). Indeed, it is arguable that the main error made by adherents of the EMH was that they failed to appreciate (or waved away as a simplifying assumption; see Fama and French 2004: 29–30) the fact that their theory only pertains under institutional conditions where there are no limits to value–price arbitrage. More specifically, for the EMH to hold, it must be the case that short selling (during bull markets) is as easy as investing (during bear markets). But it is questionable whether this assumption ever holds. Insofar as short selling is a speculative maneuver, it necessarily involves “market risk”—that is, the risk that prices will not fall. But the returns of an investor who invests for income, especially if she buys the asset outright, involves no market risk. This fundamental asymmetry means that the limits on market efficiency cannot be eliminated. As such, the final implication of this analysis is
to impart to us all a sense of humility in what we can ask of securities markets, and to regard securities prices with the kind of skepticism that is at the heart of value investing. It is crucial that we always bear in mind that there is a difference between price and value (see Zuckerman 2010).

Notes

1. Thanks to Alex Preda and Karin Knorr-Cetina for inviting me to contribute to this volume. And thanks to Catherine Turco for her invaluable feedback. The usual disclaimers apply.
2. The EMH has been discussed in somewhat different ways, though all such statements claim that the market achieves a high level of informational efficiency, whereby prices quickly incorporate material information (the “semi-strong” version of the hypothesis pertains to all public information, whereas the “strong” version pertains even to private information (see Fama 1976; Jensen 1978)); this informational efficiency is a necessary but insufficient condition for “allocative efficiency” (see Sethi 2010), whereby securities prices are the best estimate of the value of the future income stream from such securities, and therefore securities markets are allocating capital to their most productive uses.
3. One indicator of this trend is the rate of citations of the first article in a flagship sociological journal on financial markets, Baker’s (1984) network analysis of an options market. While the mean citation rate during the 1980s was 3.6/hr, it increased to 5.7/hr during the 1990s, and nearly doubled to 10.9/hr during the 2000s. (Source: Web of Science.)
4. These scholars are well represented in the volumes on the financial crisis edited by Lounsbury and Hirsch (2010). See especially the chapters by Fligstein and Goldstein (2010) and Pozner, Stimmuller, and Hirsch (2010).
6. There was essentially no options market at the time BSM was conceived. This means that the only way BSM could become accurate would be if investors came to adopt it or some version of it. Put differently, while Mackenzie and Millo argue (2003; MacKenzie 2006) that the BSM was intended to be a “camera” or description of reality but ironically became an “engine” that created the reality it purported to describe, this is inaccurate. BSM was in fact intended to be an “engine” (a tool of financial engineering) from the outset.
7. This does not mean that the profitability of projects should be the sole determinant of capital allocation. For instance, we may want to steer investment away from projects that harm the environment or which trample on workers’ rights. The point is that insofar as at least a subset of capital is to be allocated according to its profitability (perhaps incorporating taxes and incentives that reflect social welfare), capital-market prices should accurately reflect the profitability of one project over another.
8. The definition of arbitrage in this chapter involves exploiting the difference between an asset’s price and its intrinsic value. This is a different definition of arbitrage from that is frequently used by traders, and applied in Hardie and Mackenzie’s contribution to this volume, which involves finding and exploiting the difference between an asset’s price in one market and its price in another market. But even when the price for an asset is the same in all markets, it is unclear whether this price will be a good measure of the asset’s value. It is the former, “price–value,” type of arbitrage that is necessary for this to happen. And so,
the ultimate question for the claim that a market is allocatively efficient is whether price-value arbitrage is a highly effective mechanism.

9. As Fox (2009) discusses, there have long been doubts as to whether beta is itself a good measure of systematic risk. Apart from measurement issues, there is a significant conceptual gap between the probability that one's capital will be wiped out (i.e., the traditional understanding of risk, which underlies the higher yields on the debt of entities of questionable solvency) and the covariance of a stock with a market index.

10. Of course, performativity theorists are notoriously hard to pin down, both on which theories they expect to be performative and on the mechanisms that are responsible for performative effects. Rather, widely adopted predictive theories tend to be labeled performative, while widely adopted, nonpredictive theories tend to be labeled “counterperformative” (see, e.g., MacKenzie 2008: 244–59). My point here is to highlight why the inner logic of the EMH was such that it could never induce the market that it imagines.

11. That this point was not recognized by the proponents of the EMH may be seen in Fama’s famous prediction that securities analysts would disappear because they “establish a market in which fundamental analysis is a fairly useless procedure both for the average analyst and the average investor” (Fama 1965b: 58). The logical flaw in this prediction is that unless someone engages in fundamental analysis, the market cannot be efficient. So while it may be true that the average analyst and investor cannot gain from beating the market, market efficiency requires that such efforts (by EMH skeptics) do take place.

12. One of the most striking aspects of the EMH movement has been the tendency for the most passionate advocates of the EMH to become very rich through engaging in arbitrage strategies that assume market inefficiency (see Fox 2009).

13. I have not been able to find the source of this quote. My guess is that Keynes did not say it, but it was uttered by someone who was (aptly) summarizing Keynes’ perspective.

14. By contrast, a recognition that investors sometimes act irrationally is not a major source of awkwardness for the EMH. The presence of irrational or “noisy” market participants (Black 1986) is indeed awkward for the EMH, but only if they can be shown that their actions cause significant mispricings. Otherwise, irrational investors can be regarded as suckers who stubbornly refuse to learn the lesson that they cannot beat the market and thereby augment the returns of the arbitrageurs who pounce on their mistakes and quickly drive price back to its correct level. Accordingly, and as stressed by Brav and Heaton (2002) and others (e.g., Sheffrin 1996; Shleifer and Vishny 1997), the only effective critiques of the EMH are those that show that there are significant limits on arbitrage, such that those who know the difference between price and value cannot act upon such knowledge.

15. Unfortunately, this point is often obscured by Keynes’ comments on “animal spirits” as animating market behavior ([1936] 1960: 161–4). In fact, he distinguishes “the instability due to speculation” from the “instability due the characteristic of human nature” (161), but accounts of Keynes’ perspective seem to elide this distinction.

16. Accordingly, Fox (2009: 34, 338) discusses how Keynes did not in fact speculate on this basis in his role as portfolio manager for Cambridge University. Rather, he adopted a value-investing approach that is quite close to that of Graham, as described below.

17. I cannot find a source for this quote. The closest citation is: “the market is not a weighing machine, on which the value of each issue is recorded by an exact and impersonal mechanism . . . Rather we should say that the market is a voting machine, whereupon countless individuals register choices that are partly the result of reason and partly of emotion” (Graham and Dodd [1934] 1940: 27). Yet while this quote seems to deny the market's
long-run “weighing” capacity, Graham does indeed seem to assume such a capacity, as discussed below.
18. I mean “objective” in the sense of Abbott (1988: 35–40), of a set of conditions that confront all members of the relevant in common ways that are subject to independent verification and which change more slowly than attempts at interpretation and adaptation. Thus, even though the economy is a collective construction, it confronts us in terms of a set of objective conditions.
19. The past 15 years of General Electric’s dividend history may be found at <http://www.ge.com/investors/stock_info/dividend_history.html>. Such a record suggests that the management knows that it would face a significant reputational penalty should it stop paying dividends and especially if it reneged on a specific commitment to pay the upcoming quarterly dividend.
20. In theory, our lucky investor could sell the shares immediately after the ex-dividend date, thus earning an astronomical weekly return of 12 percent, which corresponds to an annual return of 624 percent without compounding. In reality, this kind of return is unavailable because prices rise in the run-up before a dividend disbursement to a degree proportional with the size of the dividend. That is, prices efficiently incorporate the timing of the expected dividend.
21. Note that in practice, the investor must also consider his needs for liquidity. That is, our calculations of yearly return assume that GE’s price will stay the same. If the investor may need his capital in the next year, he must necessarily worry about the possibility that GE’s share price will decline, thus crimping the return he receives from dividend income. Moreover, a large investor must be mindful that liquidation of a large position could itself lower the price, and thus his return. Note, however, that concerns about price declines apply to bonds as well, and the very large volume of GE shares means that it is highly liquid. Therefore, we are basically comparing apples to apples.
22. And in fact, acquisition prices are typically a premium over current stock prices, suggesting that GE would sell for a much higher price than $16/share.
23. In practice, one must consider the likelihood and price of liquidation. If there is reason to think that, for example, current management has legal or political means to prevent liquidation, a discount should be taken to the liquidation value.
24. It is worth underlining the point that the return he realizes from the intrinsic value of the stock, whether via dividend yield or liquidation of assets, has nothing to do with other investors’ beliefs. When the price of a stock declines to a point at which a given investor is confident she can earn an attractive income from ownership of the security, it is rational for her to purchase the stock even if she thinks that the price may continue to decline (whereupon more purchases are warranted). Of course, it may require a very low price to give an investor such confidence. Our point is that every asset has such a price, even if it is negative (e.g., current owners may have to pay future owners to take the asset if it is encumbered with liabilities that exceed its assets and estimated earnings capacity).
25. If the majority of current shareholders are so foolish as to sell at $1/share then our lucky investor can take control of GE and directly access its income stream, which he values as worth much more than $1/share. If only some owners are this foolish then our lucky investor buys as many shares as he can at $1, and the price will necessarily rise since the new set of shareholders will now offer shares at a price higher than $1.
26. Related points are made in the recent finance literature. In particular, it has become widely recognized that there is a basic asymmetry between bull and bear markets (with the key
implication that markets crash down but not up; see Miller 1977 for the foundational piece in this literature; see Rubenstein 2004 for an historical overview of the idea; and see Chen, Hong, and Stein 2002 and Ofek and Richardson 2002 for recent statements and empirical evidence), which derives from constraints on short selling. My approach is broadly consistent with this idea, but the key point of difference is that I am arguing that there is an asymmetry between bull and bear markets regardless of the availability of constraints on short selling. The reason is that whereas value–price arbitrage on undervalued assets is a non-speculative maneuver that involves no market risk, short selling on overvalued assets is a speculative maneuver involving significant market risk of the kind captured in the paraphrase of Keynes. In this respect, the perspective advanced here is closest to the approach of Brunnermeier and colleagues, which sees short selling as highly limited even in the absence of short-selling constraints due to the need for a critical mass to bring prices down (see especially, Abreu and Brunnermeier 2003; Brunnermeier and Nagel 2004). However, Brunnermeier does not explicitly contrast such limits on short selling (given the misleading general label of "limits to arbitrage"; cf., Shleifer and Vishny 1997) with the absence of comparable limits in the case of arbitrageurs who seek to profit from undervalued assets.

27. And the EMH does not even apply when—as in the recent real estate bubble—it is impossible to engage in short selling (see G. Zuckerman 2009). Note, however, that even while the EMH relies on the possibility of short selling, it also implies that short selling should be very limited; in particular, we should not observe situations where short sellers hold their positions for extended periods of time. The reason is that insofar as market prices result from a process where correct valuations drive out incorrect ones to arrive at a price that is the best estimate of future income given available information, and insofar as a short position reflects dissent or skepticism that the current price is right (specifically, it suggests that the current price is too high), all but the most fleeting short positions present a contradiction in terms. Thus the paradox is that: (a) on the one hand, constraints against short selling make markets inefficient; (b) but, on the other hand, the very prevalence of shorting is a sign that markets are inefficient because it means that the full range of opinion is not incorporated into price.

References