

# The Efficient-Markets Hypothesis and Entrepreneurship

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**T**he entrepreneur is a key figure in the market economy. In a dynamic economy, ideas, products, and services are constantly changing. Entrepreneurship, broadly defined, refers to actions of individuals as they strive to cope with constantly changing market conditions.<sup>1</sup> When viewed in this way, all market participants—consumers, producers, and investors—engage in entrepreneurial activity.

Despite the crucial role of entrepreneurship in the market process, the entrepreneur is often neglected in economic theory.<sup>2</sup> A good example of this neglect is the efficient-markets hypothesis (EMH) of financial investments. This theory holds that the individual investor cannot outwit the market because all available information is already incorporated in stock prices.<sup>3</sup> The efficient-markets approach taken to its logical extreme “means that a blindfolded monkey throwing darts at a newspaper’s financial pages could select a portfolio that would do just as well as one carefully selected by the expert.”<sup>4</sup> The implication is that a buy-and-hold strategy is as good as any other and that there is no scope for entrepreneurial activity in financial markets.<sup>5</sup>

Insights from the Austrian theory of the competitive market process are used in this article to show that the role of the entrepreneur in investment decisions is similar to that in other spheres of economic activity. Entrepreneurial opportunities exist whenever markets are not perfectly coordinated. Hence, it is argued, there is scope for entrepreneurial activity in financial markets just as there is in other markets. In a world of uncertainty and costly information, the pinpointing of economic inefficiencies is found to be just as difficult in financial markets as it is in all other markets. Since the EMH is a version of the zero-profit theorem of competitive equilibrium in the conventional theory of the firm, it is argued that shortcomings of the EMH are similar to those of other long-run competitive theories that focus exclusively on equilibrium outcomes while ignoring the entrepreneurial market process that generated those

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outcomes. The conclusion is that neither the dart-throwing monkey nor any other automaton is a good substitute for the entrepreneur in investment markets where relative prospects for different assets are constantly changing. Before specifically considering the role of entrepreneurship in financial markets, the reason for the neglect of the entrepreneur in conventional economic analysis is briefly analyzed.

## The Neglected Entrepreneur

The entrepreneur seldom appears in contemporary economic theory. A check of the index of economic theory texts will show that most make few or no references to entrepreneurship.<sup>6</sup> Why is the theoretical firm "entrepreneurless"?<sup>7</sup>

Neglect of the entrepreneurial role in formal economic analysis quite likely results from the preoccupation of economic theory with final equilibrium positions.<sup>8</sup> If markets are in equilibrium, economic activity is perfectly coordinated and there is no scope for profit-seeking activity. In this situation, a blindfolded monkey *can* handle the entrepreneurial function, for it has no duties. When the decisions of all market participants perfectly mesh, there are no profit opportunities. However, it is difficult to even conceive of a world in which everyone's plans are perfectly compatible and no changes are ever expected. In reality, information about the uncertain future is always imperfect and market participants constantly act to improve their lot. Thus, disequilibria are pervasive in a dynamic economy and entrepreneurship can be visualized as the ability to deal with these economic maladjustments.<sup>9</sup> I would not expect the plans of all market participants to be mutually compatible; but if they were, the economic world and all its transactions and contractual relationships would differ radically from those of our familiar economy.

Spotting opportunities for gain, initiating actions, and reaping the consequences of actions taken are all functions of the entrepreneur. In the competitive entrepreneurial market process, the pattern of decisions at any moment is different from the patterns of earlier periods as market participants become aware of new opportunities.<sup>10</sup> Consumers, producers, and investors generate a flow of information as they test their plans by engaging in market activity. Indeed, the market process itself consists of the systematic plan changes generated by the flow of information created by market participation.

Neglect of the entrepreneur in economic theory is also related to the way in which the equilibrium approach abstracts from knowledge problems. The conventional approach in economic analysis assumes that information and transactions costs "are such as to provide the conditions that are required for an economic equilibrium."<sup>11</sup> In this approach, emphasis is on the problem of converting resources into outputs, assuming that information on means and ends

is given.<sup>12</sup> If information is given, success hinges on the decisionmaker's proficiency in mathematical calculation, and there is no scope for entrepreneurship. That is, if there are a given number of economic alternatives with known costs and outcomes, the economic decision is reduced to calculation. In reality, of course, means and ends are not given, and the entrepreneur must attempt to discover market opportunities and cope with constantly changing economic conditions. Thus, making the right decision calls for much more than correct mathematical calculation. It requires a shrewd or lucky assessment of present and future conditions.<sup>13</sup> The constant entry (and exit) of firms providing goods and services that run the gamut from fast-food to electronics is a manifestation of individual attempts to profit from constantly changing market conditions—these ventures are entrepreneurial testings of the waters.

The entrepreneur's profit and loss calculations are based on subjective estimates of future market conditions. These calculations are not the same as profits and losses for tax purposes and are not open to examination on the part of an outside observer. This point will be returned to later when it is shown why average returns to entrepreneurship may have little effect on incentives of the individual entrepreneur to engage in market activity.

## **Entrepreneurial Opportunities and Efficient Markets**

An efficient market has been defined as one in which prices always fully reflect all available, relevant information and in which adjustment to new information is virtually instantaneous.<sup>14</sup> The efficient-markets theory is the formal statement of market efficiency in securities markets. The strong EMH implies that markets are always in equilibrium—in which case profit-seeking activity will be unrewarded and even penalized by positive transactions costs. The implications of the EMH are demonstrated by a well-known academic story about a finance professor and two of his students.

The finance professor . . . was convinced that markets were always perfectly efficient. When he and the students spotted a \$10 bill lying on the street, he told them to ignore it. If it was really a \$10 bill, he reasoned out loud, someone would have already picked it up.<sup>15</sup>

Since uncertainty permeates markets, however, there is scope for entrepreneurship. Indeed, Israel Kirzner maintains that the essence of entrepreneurship is the alertness of market participants to profit from opportunities that others pass by.<sup>16</sup> Entrepreneurship in this sense is an equilibrating force that involves the grasping of opportunities that have somehow escaped notice. For example, perceived differences in intertemporal or interspatial demands offer the possibility of pure arbitrage profits. These profits might be viewed as a "sure

thing”—similar to a \$10 bill lying in the street. In reality, however, the arbitrageur is subject to uncertainty, and when transactions are not instantaneous, expected conditions may not materialize, resulting in losses.<sup>17</sup>

Even seemingly instantaneous transactions sometimes are not sure bets—entrepreneurs may face unexpected freezing of assets, bankruptcy filings, deaths, wars, and frauds such as bad checks and empty oil tanks. Moreover, no contract is so complete that it provides smooth settlement under all unanticipated conditions. The conclusion is that though entrepreneurial profit opportunities exist, they are uncertain. Consequently, there is a role for alert entrepreneurs in financial markets just as there is in all other markets. The scope for entrepreneurship in financial markets manifests itself in many different forms—from actions by individual investors to those of financial analysts. Financial markets are constantly changing and never perfectly coordinated. If individual plans are to be fully compatible, actions must be based on the same set of expectations.<sup>18</sup> Yet, actions of market participants suggest that their expectations about future supply and demand conditions vary widely. Indeed, every investment transaction that takes place is between two parties with opposite expectations. These differences in expectations are an important part of the incomplete coordination in financial markets that provides scope for entrepreneurship. The conclusion is that time and uncertainty pose problems and create opportunities for the entrepreneur in financial markets as in other markets.<sup>19</sup>

In the EMH view, profit opportunities in financial markets are considered to be “anomalies.”<sup>20</sup> If all available information is already incorporated in stock prices, any remaining profit opportunity is viewed as a paradox. However, profit opportunities should be viewed, not as anomalies, but rather as expected outcomes of a competitive entrepreneurial market process. In the competitive market process, it is to be expected that some decisionmakers will lose and some will gain. Indeed, the market is a profit *and* loss system. Entrepreneurship represents an attempt to create or discover and thereby take advantage of profit opportunities not yet noticed by others. Since entrepreneurial profits in the market process occur only where there are maladjustments, it is misleading to speak of a “normal” rate of profit.<sup>21</sup> Profit and loss are phenomena representing deviations from “normalcy” and have no place in equilibrium. Moreover, there is an inherent tendency in the competitive process for profits to disappear. Profits are a permanent phenomenon only because new maladjustments appear daily.

The role of market prices in coordinating and transmitting information is well known, if often not fully appreciated. However, the competitive market process is useful not only in mobilizing existing knowledge but also in generating an awareness of opportunities whose very existence is unknown.<sup>22</sup> Again, it is to be expected that all entrepreneurs will not be equally adept either in coping with uncertainty or in discovering profitable opportunities.

The focus on the relationship between entrepreneurship and economic maladjustments highlights the idea that much knowledge affecting the individual

decisionmaker is not explicit. As Hayek emphasizes, a great deal of information influencing market decisions is unique to individuals—especially knowledge of the particular circumstances of time and place, and “it is with respect to this that practically every individual has some advantage over all others.”<sup>23</sup> And even explicit news requires daily interpretation by agents as it affects their abilities to cope with constantly changing economic conditions.

There is no way to know in advance which entrepreneurial ventures will be successful. The entrepreneurs who develop and invest early in budding growth companies are likely to receive high profits. The risk is high, but so are the prospective returns *if* the venture is successful. Investors in successful new ventures will be amply rewarded. The expectation of profits associated with the production and distribution of new products and services is the inducement that lures capital onto untried trails. The profiting from the creation of value where none existed before is the very essence of the entrepreneurial market process. Indeed, profits are determined primarily by the extent to which the entrepreneur has correctly anticipated future uncertain market conditions.

The preceding discussion, however, does not suggest that there is a formula to “beat the market.” The financial investor faces a problem similar to that of other entrepreneurs in coping with problems created by time and uncertainty. In entrepreneurial choice, there is no meaningful way to describe future market outcomes objectively. When future values of economic magnitudes are treated as random variables describable by a subjectively assigned probability distribution, there is an implicit assumption that we know the future—at least the form of the probability distribution that describes it. In this approach to entrepreneurial activity, our ignorance of the future is effectively replaced by an assumption of knowledge.<sup>24</sup>

## **The Elusive Nature of Economic Efficiency**

Many attempts have been made to identify market inefficiencies, where an efficient market is defined as one in which prices fully reflect all known information. However, efficiency is an elusive concept in financial markets as it is elsewhere.<sup>25</sup> Market participants rationally cannot be expected to base their decisions on all available information. As Stigler states: “Information costs are the costs of transportation from ignorance to omniscience and seldom can a trader afford to take the entire trip.”<sup>26</sup> A problem arises in identifying inefficient markets under real-world conditions because of uncertainty, imperfect knowledge, and costly information. A meaningful efficiency test has not been devised even under static neoclassical conditions where a defensible criterion of efficiency must be based on an “appropriate amount” of information.<sup>27</sup> The amount of knowledge acquired by market participants hinges on the perceived costs and benefits. Thus, the failure of market participants to become better

informed in markets where they are evaluating *perceived opportunities* might merely mean that the expected costs exceed the benefits.<sup>28</sup> The discovery that all known information is not fully reflected in prices requires resources, including mental efforts and attention, so it does not necessarily mean that markets are inefficient. The conclusion that a financial market is inefficient implies that an attainable alternative can better cope with real-world uncertainty. As critics of the “nirvana approach” have persuasively argued, however, all institutional arrangements are imperfect when measured against an idealized norm.<sup>29</sup>

The problem of specifying the “optimal” amount of market information is even more complicated under dynamic economic conditions of the real world where a crucially important role of the entrepreneur is to make consumers aware of available but unperceived opportunities. In this case, information about an economic good cannot be considered as a complementary ingredient that might, in principle, be purchased separately from the good.<sup>30</sup> It makes no sense to talk about consumers’ demand for information on an investment alternative about which they know nothing. Much information about financial investments, for example, is concerned with making the consumer either aware of unknown investment opportunities or of unperceived aspects of already known investment alternatives. Thus, the problem of identifying information inefficiencies under dynamic conditions wherever increasing knowledge has to be called to people’s attention is even more intractable than in the static neoclassical approach.

There is a subtle distinction between market inefficiency and the existence of profit opportunities.<sup>31</sup> The fact that an outside observer cannot identify market inefficiency under real-world conditions of uncertainty and costly information does not imply a lack of entrepreneurial opportunities. At any given time, as previously stressed, profit opportunities in a dynamic economy are likely to exist because individual plans are not perfectly coordinated. This conclusion is consistent with the evidence in financial markets: “The sum total of all the evidence that has been accumulated to date suggests that discrepancies do, in fact, exist from time to time and from security to security. There is no theoretical reason why an investor cannot do a superior job of analysis and profit thereby.”<sup>32</sup>

## Entrepreneurship—Financial versus Other Assets

Assets of all sorts (including farms, forests, houses, shares of companies, fixed-interest securities, and even property such as precious metals, jewels, and antiques) compete with each other as investments. There is a continual endeavor by owners to sell those assets whose prospects the market values more highly than the owner does and to buy those in which the market valuation is less than the owners’.

Asset markets are “inherently restless,” as the relative prospects for various types of assets are constantly changing in a dynamic economy.<sup>34</sup> Historically, it was widely believed that common stocks scored relatively favorable long-run returns and were an effective hedge against inflation. In the 1970s, however, common stocks underperformed long-term bonds, while gold, stamps, other nontraditional investments, and farmland produced above-average returns.<sup>35</sup> The situation changed dramatically during the first half of the 1980s, with stocks performing much better than gold and farmland.

Even within the stock market, industries perform quite differently from one another. Over the 1943–73 period, the S&P Industrial Index increased twelve-fold, but this average consisted of widely varying industry performances. Office and business equipment stock increased 145 times and stock of the electronics industry by almost 69 times. At the other extreme, stock prices in the lead and zinc industry were less than two times beginning levels, whereas those of sugar and textile apparel industries were barely three times higher.<sup>36</sup> Even in shorter periods, industries perform quite differently from each other. Consequently, whether one is considering different types of assets or stock prices in different industries, outcomes are likely to vary widely and past results are not always good predictors of future performance. It is the nature of speculative assets that their relative prices will be continually changing—and in unpredictable ways.

In the market process, asset owners are constantly shifting their portfolios in response to changing economic conditions. Financial markets are similar to other asset markets in that entrepreneurial profits and losses are essential phenomena. There cannot be financial markets without them. Mises stresses that profit opportunities exist even in a “retrogressing economy” where the total sum of entrepreneurial losses is higher than that of profits.<sup>37</sup> It might be asked why anyone would embark on an entrepreneurial venture if it is known in advance that the mathematical chances of earning profits are smaller than those of suffering losses. However, this is an incorrect mode of posing the problem.<sup>38</sup> When individual investment decisions are considered in the context of Knightian uncertainty, where the set of outcomes is not and cannot be determinate, the very notion of expected-value maximization is ambiguous and misleading.<sup>39</sup> Moreover, entrepreneurs do not act as members of a class but as individuals. Individual entrepreneurs are not concerned about the average outcome but rather about their own outcomes. “Each entrepreneur confronts a unique situation, and he thinks he can see opportunities, can create opportunities, to make profits. He acts quite simply because he thinks he can win.”<sup>40</sup>

How can one test the efficacy of entrepreneurship? A public measure of the effectiveness of an action after the event when the outcome of an action is known is useless as a guide to entrepreneurial choice.<sup>41</sup> The action chosen is based not on circumstances of publicly agreed character but rather on the individual’s own private assessment. When the subjective nature of entrepreneurial choice is

considered, it is not surprising that entrepreneurs continue to search for profit opportunities whether entrepreneurial profits, on average, are positive or negative.

The main object of economic theory is to make the world around us intelligible in terms of human action. The entrepreneurial market-process view of economic activity is consistent with what we observe in asset markets of all types. This approach recognizes the importance and implications of uncertainty for entrepreneurial choice—regardless of whether the choices relate to production, consumption, or investments. An enterprise, an investment, a bet, or gamble has the effect of making some good thing possible—but always at a cost.<sup>42</sup> There is no sure way to achieve full success or to avoid disappointment in the real world where market data are shrouded in uncertainty.<sup>43</sup> Although there is no way to avoid the problems posed by time and uncertainty in real-world asset markets, any type of entrepreneurial venture is likely to be more successful if the decisionmaker prepares by studying the evidence.

When considered from the viewpoint of the entrepreneurial market process, investment activity in financial markets fundamentally is no different from investments in other asset markets. Random asset purchases on the part of investors in financial assets is unlikely to be a viable strategy by profit-seeking entrepreneurs. Moreover, no one can take totally predictable actions or opt out of entrepreneurship unless markets are perfectly coordinated. Since this can never happen, any model of investment activity that leaves no room for the creative elements of entrepreneurship creates confusion rather than enlightenment in attempts to understand market activity.<sup>44</sup> If the model omits the entrepreneur, the driving force of the market system is eliminated.

### **Implications—Buy and Hold versus Entrepreneurship**

The EMH suggests that the individual investor cannot consistently outperform a buy-and-hold strategy. Granting that this is the case does not imply that entrepreneurial activity has no value. In the course of searching for ways to profit from “restless asset markets,” investors eliminate profit opportunities for others. In the absence of such entrepreneurial activity in securities markets, there would be no action taken to reduce ignorance, exploit profit opportunities, and improve market coordination. The blindfolded monkey throwing darts at a newspaper’s financial pages is not an equilibrating force in financial markets. Indeed, a considerable amount of knowledge is assumed on the part of the monkey in suggesting that entrepreneurial alternatives have been narrowed to financial-page investment choices. The astute entrepreneur, as suggested previously, must consider a broad range of investments—of which financial investments are only one type.

Regardless of whether it can be demonstrated that the individual entrepreneur can improve on a buy-and-hold strategy, entrepreneurship is a key

ingredient in financial and all other asset markets. It is the actions of profit-seeking entrepreneurs that coordinate market activity and enable investors following a “buy-and-hold” strategy to compare favorably, on average, with those more actively engaged in market activity. The value of the trading activity that provides the benefits in highly organized financial markets is heavily discounted in the EMH. In other areas of economic activity, those individuals who accept the benefits without paying their share of the cost of providing public goods are said to pose a “free-rider problem.” From the standpoint of public policy, the implication of the EMH that people generally should follow a buy-and-hold strategy—and be “free riders”—is ironic.

The preceding analysis appears to be consistent with Lachmann’s analysis of capital-asset valuation and portfolio management.<sup>45</sup> Lachmann analyzes the asset structure of a productive enterprise as a complex network of relationships that transmits knowledge and the incentive for action from one group to another. Since the entrepreneurial decision is concerned with the making and revising of plans, a change in the composition of an investment portfolio involves the same kind of action as a change in production plan.<sup>46</sup> That is, the capital owner must regroup assets in response to constantly changing market conditions. Stock exchanges, by facilitating the exchange of knowledge, tend to make the expectations of large numbers of people more consistent. In this way, security markets promote consistent changes in capital investment and economic progress, since in the long run a market economy “substitutes entrepreneurs who can read the signs of the times for those who cannot.”<sup>47</sup> The notion of the portfolio owner as a passive income recipient clearly is incompatible with the Lachmann view of market activity.

The competitive entrepreneurial process is fundamentally the same in all types of markets. The EMH is but another form of the zero-profit theorem in economics that holds that economic profit for any firm in a competitive industry is zero in the long run. In the study of financial and other markets, the preceding analysis suggests that more attention should be given to the market process generating the outcomes and less to the outcomes themselves, because they assume away informational differences and profit opportunities.<sup>48</sup>

In the entrepreneurial process, the search for profit opportunities eliminates or greatly reduces the prospects of success over the long run.<sup>49</sup> In EMH terminology, it is the search by investors for market imperfections in the belief that the market is not efficient that ultimately makes the market efficient. Potential short-run profits provide the motivation for entrepreneurial activity even though the likelihood of consistently superior entrepreneurial success is quite small.

## Conclusions

An equilibrium view of economic activity is implicit in efficient-markets theory (and conventional economic theory generally). In a world in which individual

plans are perfectly coordinated, all profit opportunities have been exploited and there is no scope for entrepreneurship.

The competitive entrepreneurial market-process view of economic activity is quite different. When time and uncertainty are taken seriously, one does not expect individual plans to be perfectly coordinated in markets for financial or other types of assets. Thus, coordination of market activity is never complete because change is always occurring. Consequently, there are likely to be entrepreneurial opportunities in asset markets of all types. Indeed, in this view, disequilibria are pervasive as entrepreneurship is exercised by consumers, producers, and investors in coping with constantly changing economic conditions. Entrepreneurship is closely linked with profits (and losses) in the competitive entrepreneurial process that is driven by the search for profits.

This article does not imply that the EMH, other zero-profit theorems, or other competitive equilibrium models are useless tools in economic analysis. It does suggest that much more attention should be given to the entrepreneurial market process that creates pressures to reduce or eliminate economic profits. It is the entrepreneurial search for profits that gives meaning to the zero-profit idea of equilibrium as an end product of the market process.

All entrepreneurial activity is shrouded in uncertainty, and there is no assurance that entrepreneurial activity by anyone will be successful. The EMH, at least to some extent, discounts the importance of entrepreneurship by suggesting that an automaton can substitute for entrepreneurial activity. The individual investor may or may not be able to beat the market averages. However, it is not market averages, but the entrepreneur's subjective assessment of profit opportunities that motivates entrepreneurial activity in securities markets as in other investments.

Competition means that entrepreneurs are unlikely to earn consistently superior returns. Although constantly changing market conditions suggest that there are likely to be profit opportunities, the constant striving for profit greatly reduces the chances of individual success. Clearly, entrepreneurial profit-seeking activity is a game worth winning, although in retrospect it frequently is a game not worth playing.<sup>50</sup> Regardless of an individual's success in the short or the long run, however, the profit-seeking entrepreneur is the key figure in financial as well as in other asset markets.

## Notes

1. Ludwig von Mises, *Human Action*, 3rd ed. (Chicago: Henry Regnery, 1966), p. 254.

2. Israel M. Kirzner, *Competition and Entrepreneurship* (Chicago: University of Chicago Press, 1973).

3. "When someone refers to efficient capital markets, they mean that *security prices fully reflect all available information*." Edwin J. Elton and Martin J. Gruber,

*Modern Portfolio Theory and Investment Analysis*, 3rd ed. (New York: John Wiley & Sons, 1987), p. 361.

4. Burton G. Malkiel, *A Random Walk Down Wall Street*, 4th ed. (New York: W.W. Norton, 1985), p. 16.

5. There are different versions of the EMH depending upon the assumption made about the amounts and kinds of data reflected in stock prices. The discussion of this article, in a narrow sense, applies only to the "strong" form of the EMH, which asserts that stock prices fully reflect *all* information, public and nonpublic. In a broad sense, however, the discussion applies to all efficient market theories that concentrate on the results of the competitive market process, deemphasizing the actions of the market participants responsible for those results. For more discussion of the different versions of the EMH, see Charles P. Jones, *Investments: Analysis and Management* (New York: John Wiley & Sons, 1985), p. 422.

6. "The references are scanty and more often they are totally absent. The theoretical firm is entrepreneurless—the Prince of Denmark has been expunged from the discussion of *Hamlet*." William J. Baumol, "Entrepreneurship in Economic Theory," *American Economic Review*, vol. 58, May 1968, p. 66.

7. Mark Blaug describes the role of entrepreneurship in economics during the past two centuries, including the disappearance of the entrepreneur from the center of the stage in economic analysis. After analyzing the role of entrepreneurship in the works of Adam Smith, Richard Cantillon, Frank Knight, J.A. Schumpeter, and others, Blaug concludes: "It is a scandal that nowadays students of economics can spend years in the study of the subject before hearing the term *entrepreneur*." Mark Blaug, *Economic History and the History of Economics* (New York: New York University Press, 1986), p. 229.

There has been a great deal of work on entrepreneurship in recent years by a number of economists, many (most?) of whom are associated with the Austrian school. However, this work has had little influence on current economic textbooks where entrepreneurship is "hardly mentioned, or mentioned only in passing." *Ibid*, p. 219.

8. Israel M. Kirzner, *Perception, Opportunity, and Profit* (Chicago: University of Chicago Press, 1979), p. 5.

9. T.W. Schultz, "Investment in Entrepreneurial Ability," *Scandinavian Journal of Economics*, vol. 82, no. 4, 1980, pp. 437–48.

10. Israel M. Kirzner, Competition and Entrepreneurship, p. 15.

11. T.W. Schultz, "The Value of the Ability to Deal with Disequilibria," *Journal of Economic Literature*, vol. 13, September 1975, p. 829.

12. F.A. Hayek, "The Use of Knowledge in Society," *Individualism and Economic Order* (Chicago: University of Chicago Press, 1948).

13. Israel M. Kirzner, *Discovery and the Capitalist Process* (Chicago: University of Chicago Press, 1985), p. 17.

Moreover, the greater the uncertainties of the world, the greater is the possibility that profits would go to "venturesome and lucky rather than to logical, careful, fact-gathering individuals." A.A. Alchian, "Uncertainty, Evolution and Economic Theory," *Journal of Political Economy*, vol. 58, no. 3, June 1950, pp. 211–21. Reprinted in A.A. Alchian, *Economic Forces at Work* (Indianapolis: Liberty Press, 1977), p. 20.

14. James H. Lorie, Peter Dodd, and Mary Hamilton Kimpton, *The Stock Market: Theories and Evidence*, 2nd ed. (Homewood, Ill.: Dow Jones-Irwin, 1985), p. 177.

15. Burton G. Malkiel, *A Random Walk Down Wall Street*, p. 348.
16. Israel M. Kirzner, *Perception, Opportunity, and Profit*, p. 8.
17. Murray Rothbard, "Professor Hèbert on Entrepreneurship," *Journal of Libertarian Studies*, vol. 7, fall 1985, p. 282.
18. Gerald P. O'Driscoll, Jr., and M.J. Rizzo, *The Economics of Time and Ignorance* (New York: Basil Blackwell, 1985), p. 80.
19. *Ibid.* pp. 57–58.
20. Burton G. Malkiel, *A Random Walk Down Wall Street*, p. 349. However, the EMH can also accommodate outcomes with some investors outperforming the market. Given a large number of investments, some can be expected to earn greater than average rates of return by chance alone. Although the long-run performance record for these investments is likely to fall back in line with average rates of return for investments of similar risk, the long run may be quite long. One statistician estimated that it would take about seventy years of data to demonstrate conclusively that an annual rate of return 2 percent above the market rate was the result of superior investment skill rather than luck. Gerald W. Perritt, "Consistent Winners: Is It Skill—or Luck" *AIAA Journal*, vol. 9, no. 9, October 1987, p. 27.
- Alchian also stresses that individual behavior based on entrepreneurial motivation does not necessarily imply a collective pattern of behavior that is different from a random selection of actions. Under uncertainty, people's judgments will differ, even when based on the best available evidence. And even though no decisionmakers may be making their individual choices by tossing coins, the aggregate set of actions of the entire group may not be distinguishable from a set of individual actions, each selected at random. A.A. Alchian, *Economic Forces at Work*, pp. 24–25. Thus, the existence of seemingly superior investors is likely to be consistent with the EMH.
21. Ludwig von Mises, *Human Action*, p. 297. The "normal" rate of profit should be distinguished from the long-run equilibrium rate of interest. The rate of interest is positive because people have a positive rate of time preference and interest rates would be positive even in market equilibrium. Entrepreneurial profit, in contrast, is the residual when factors are paid on the basis of opportunity cost and is positive or negative because of uncertainty.
22. Friedrich A. Hayek, "Competition as a Discovery Process," chapter 12 in *New Studies in Philosophy, Politics, Economics and the History of Ideas* (Chicago: University of Chicago Press, 1978).
23. F.A. Hayek, "The Use of Knowledge in Society," in *Individualism and Economic Order* (Chicago: University of Chicago Press, 1948), p. 80.
24. Douglas Vickers, "The Uncertainty about Uncertainty: A Paradigmatic Comment on Professor Weiss' Theory of the Firm," *Eastern Economic Journal*, vol. 10, March 1984, pp. 71–77.
25. E.C. Pasour, Jr., "Economic Efficiency: Touchstone or Mirage," *The Intercollegiate Review*, vol. 17, fall/winter 1981, pp. 33–44.
26. George J. Stigler, "Imperfections in the Capital Market," *Journal of Political Economy*, vol. 75, June 1967, p. 291.
27. Harold Demsetz, "Information and Efficiency: Another Viewpoint," *Journal of Law and Economics*, vol. 12, April 1969, pp. 1–22.
28. Israel M. Kirzner, *Competition and Entrepreneurship*, pp. 155–59.
29. Harold Demsetz, "Information and Efficiency . . .," pp. 1–22.

30. Israel M. Kirzner, *Competition and Entrepreneurship*, pp. 155–59.
31. E.C. Pasour, Jr., “Economic Efficiency and Inefficient Economics: Another View,” *Journal of Post Keynesian Economics*, vol. IV, spring 1982, pp. 454–59.
32. Charles P. Jones, *Investments: Analysis and Management*, p. 434.
33. George L.S. Shackle, *Epistemics and Economics* (Cambridge, England: Cambridge University Press, 1972), p. 195.
34. Ibid.
35. Burton G. Malkiel, *A Random Walk Down Wall Street*, pp. 298–99.
36. Charles P. Jones, *Investments: Analysis and Management*, pp. 334–35.
37. Ludwig von Mises, *Human Action*, p. 298.
38. Ibid., p. 299.
39. James M. Buchanan and A. Di Pierro, “Cognition, Choice, and Entrepreneurship,” *Southern Economic Journal*, vol. 46, January 1980, p. 700.
40. Ibid.
41. George L.S. Shackle, *Epistemics and Economics*, p. 123.
42. George L.S. Shackle, “The Human Predicament,” *Annals of the American Academy of Political and Social Science*, vol. 412, March 1974, p. 10.
43. Even as shrewd an economic analyst as Baumol attempts to distinguish between speculation and investing (William J. Baumol, “Entrepreneurship in Economic Theory,” p. 18). All entrepreneurial activity, however, involves speculation (Ludwig von Mises, *Human Action*).
44. James M. Buchanan and A. Di Pierro, “Cognition, Choice, and Entrepreneurship,” p. 701.
45. Ludwig M. Lachmann, *Capital and Its Structure* (Kansas City, Kans.: Sheed Andrews and McMeel, 1978).
46. Ibid., p. 98.
47. Ibid., p. 71.
48. The rational expectations hypothesis (RAT) of macroeconomics is another widely discussed example of the zero-profit theorem. Such models “typically begin with the assumptions that all profit opportunities have been exploited and all necessary information has already been acquired.” In RAT, too, the market process has come to an end and there is no scope for entrepreneurial activity. Gerald P. O’Driscoll, Jr., and Mario J. Rizzo, *The Economics of Time and Ignorance* (New York: Basil Blackwell, 1985), p. 215.
49. James H. Lorie, Peter Dodd, and Mary Hamilton Kimpton, *The Stock Market: Theories and Evidence*, pp. 80–81.
50. Ibid., p. 81.