



A Random Walk Down San Fernando Street

The entrepreneur is the intermediary who combines inputs to satisfy consumers, takes risks, and creates new and improved goods and processes. Adam Smith, Jean Baptiste Say, and others have explained the role of the entrepreneur and the market process. Two more modern ideas include the rational expectations and efficient market hypotheses—markets aggregate available information, recognizing and eliminating price discrepancies quickly—no \$20 bills are left on the ground. If true, how is it that entrepreneurs find profit opportunities and innovate? We offer an answer through an exercise that instructors can easily replicate with their students.

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1. Introduction

We have observed that many of our students come into the classroom with the impression that their knowledge of the world is complete. This is particularly true of entering freshmen. In reality, of course, education should humble one by demonstrating that the more one knows, the more there is to know and the less certain one should be of those things they think are true. Students are shocked to realize that some things they think are true are not, and that each individual might know things that are not at all apparent to others. Much of an instructor's semester or quarter is focused on moving students from comfort with their current ideas towards skepticism and the joy of discovering alternative ways of thinking.

Developing established mental frameworks is often a slow and difficult process. While lecturing has been and remains for many the primary delivery system for economics, particularly principles classes, some instructors have found innovative ways of shaking their students out of their complacency. These active learning techniques include economic games (the trade game), rap videos ("Fear the Boom and Bust: Keynes vs Hayek"), music ("From Abba to Zeppelin, Led: Using Music to Teach Economics"), movies ("Beyond Buttered Popcorn: A Project Using Movies to Teach Game Theory in Introductory Economics"), popular books (*Freakonomics*), computer simulations ("An In-Class Experiment to Teach Marginal Revenue Product Using the Baseball Labor Market and Moneyball"), cooperative learning presentations, and storytelling, to name a few examples. Each of these and others (alone or in combination) can be tailored to the particular instructor's teaching style. Our goal here is to use multiple active learning techniques so students understand that much knowledge is tacit and evolving as individuals subjectively perceive their environment. Students will be able to a) *identify* the unique viewpoints observed in a random walk, b) *explain* how entrepreneurs challenge the statement, "If there is a \$20 bill lying on the ground, it would already have been picked up, and c) *analyze* how students' subjective observations support the notion that knowledge is unique and personal.

This paper has a two-fold emphasis. First, we seek to demonstrate how instructors can convince students that their mental framework is both evolving and unique. Second, we provide an original way of introducing entrepreneurship to principles classes. We have developed a simple method that actively engages students in recognizing their singular mental framework while also introducing entrepreneurial insight. This lesson can be as active as an instructor wishes, but it will always have at least one active learning element at the beginning and end of the session. Initially, we take the students for a short walk around campus, in our case along San Fernando Street.¹ We also use the technique of contrasting seemingly conflicting economic ideas and use a discussion so students can analyze the ideas to synthesize a deeper understanding of the entrepreneurial market process. In this case, we outline two views of the market. First is the more Austrian view of the profit-seeking entrepreneur who drives the market process and creates economic growth. Second is the more traditional view of the market modeled on perfect competition where participants have rational expectations and market outcomes are efficient so that opportunities are quickly seen and arbitrated away, leaving little room for the entrepreneur. Here there are no \$20 bills left lying on the sidewalk. These seemingly conflicting visions allow us to use the history of economic thought to tell the story of the evolution of two different theories.² We cap this off with student engagement over their initial walk. Because we want to stress the insight provided by the walk in this paper, we have necessarily abridged our

¹ Instructors could also simply show a short video of a random walk. While this is somewhat less effective, it can be used to get the point across if one follows the same format.

² This is only one alternative. There are plenty of examples of seemingly conflicting ideas that instructors can use to stimulate deeper thinking such as whether entrepreneurs are equilibrating or disequilibrating, the difference between scientific and tacit knowledge, whether the economy can be centrally planned, the intent versus the actual outcomes of regulation, and a myriad of others. Those centered around elements of entrepreneurship are particularly applicable.

discussion of the opposing ideas here.³

This paper is divided into several sections. After the introduction, Section 2 provides a brief literature review of the development of active learning strategies and outcomes, as well as the history of teaching entrepreneurship in principles classes. Section 3 sets up the techniques used for this learning session. Section 3a gives a brief outline of the development of the entrepreneur in the market process. This section is by no means a complete survey, which could easily fill several books. Rather, it is a synopsis of important points made by leading advocates of entrepreneurship and market process theory. Section 3b gives a brief outline of perfect competition as supported by rational expectations and efficient market theories (a condensed outline following the format of Section 3a.). Section 4 notes the apparent paradox between the market process understanding of entrepreneurship and rational, efficient market equilibrium. We propose a synthesis that can link these concepts. Section 5 describes the final exercise based on the initial walk that gives a simple but clear demonstration of individual tacit knowledge. Section 6 provides concluding remarks.

2. Literature Review

There has been extensive literature over the last fifty years exploring the teaching of economics. The American Economic Association and Allied Social Sciences as well as others have encouraged the research and implementation of active learning methods to the standard of classroom lecturing since the 1970s (Becker & Watts, 2001). Siegfried and Fels (1979) produced a comprehensive study of alternatives to the standard economic lecture, particularly in principles classes. They found that the efficacy of these techniques required more study, particularly around better controls and measurements. Finally, they suggested that instructors should employ multiple teaching strategies, "Different students learn in different ways. A menu of techniques may dominate any single one." Unfortunately, this insight had a modest effect on the teaching. Instructors clung to the passive lecture over the next several decades despite numerous calls for change (Becker et al., 1991; Becker & Watts, 1995; Becker, 1997). Becker and Watts noted the lack of alternatives may have led to the decline in economic enrollments in the 1980s and 90s (Becker, 1997). "There is evidence that economists are less likely to use non-lecture teaching methods than instructors in other fields, and that students rate economics instructors somewhat lower than the rate other instructors" (Becker & Watts, 2001). While simulations were one of the active techniques that instructors found useful in economics, Porter, Riley, and Ruffer (2004) found very little support for their impact on learning outcomes. Several proponents of active techniques pointed to the high startup costs of employing many of these methods. This led several authors to provide materials outlining active techniques in order to lower instructor implementation costs, a trend that continues today (see Becker & Watts, 1995; Becker & Watts, 2001; Becker et al. 2006; Hall & Lawson, 2019). Siriopoulos and Pomonis (2006) provided a literature review of the active versus passive teaching debate covering economics, finance, accounting, and business studies. Their research review suggested that there was an increased number of instructors supporting active learning strategies but effectiveness remained uncorroborated.

Active learning methods made inroads in economics by 2014. Goff and Kauper (2014) surveyed 275 principles instructors, finding roughly one-third thought students learned best from lectures; one-third thought students did not learn best from lectures, but lectures were cost-effective; and one-third preferred active learning methods. More recently, Estill and Means (2019) found improvements from the 1990s when most instructors only lectured and used the chalk (or white) board. (Becker, 1997). Malek, Hall, and Hodges (2014) studied the effectiveness

³For those who are interested in a more detailed discussion around the topic of entrepreneurship and its relationship to rational expectations and efficient markets, please feel free to contact the authors.

of lectures in conjunction with alternative teaching methods such as simulations, group activities, and audio-visual presentations of material (videos and video clips) compared to a strict lecture ("chalk and talk") method of teaching. However, this study found no statistically significant improvement in student performance using mixed teaching methods.

Allgood, Walstad, and Siegfried (2015) set out to review "a range of studies and present them in a way that gives academic economists more insights about teaching and learning..." As previously noted, they found that different standardized treatment methods limited the understanding of potential learning gains. "Organization and clarity still seem to be the most important attributes of effective economics instructors from students' perspective." Only classroom experiments and cooperative learning showed consistent positive effects on student achievement in the review. The pace of change in economics remained slow. Onger (2017) reported that students continued to rate economics and instruction quality among the lowest of subjects taught at universities in the United States where lecturing continued to be the preferred delivery method for many (supported by Picault, 2019). Echoing Siegfried and Fels (1997), Onger suggested that, "a multiple-method teaching technique is recommended based on research findings." (Onger, 2017). Dolvin and Pyles (2018) found that the use of games and simulations, "generally increases both knowledge and interest level." New articles and books continued to offer insights into additional active learning strategies. Picault (2019) focused on active learning tools he found particularly adapted to millennials in three broad categories: illustrative tools, instructor-crafted methods, and student-crafted methods. While not trying to estimate how effective these are, this piece does provide specific resources for those who wish to use more innovative methods. Hall and Lawson (2019) provided an edited book compilation of methods, *Teaching Economics: Perspectives on Innovative Economics Education*, to which one of this paper's authors contributed. One interesting finding is that, "Physical activity has been shown to increase students' attention, concentration, focus, cognition, memory, and academic achievement" (Hall & Lawson, 2019). While support for active learning methods continues to develop, those instructors who do choose active learning strategies do not report reverting to passive strategies (Becker et al., 2006). We believe that providing mixed strategies including physical activity is more engaging for us and our students.

Before 2000 principles textbooks had little to say about entrepreneurship. Baumol (1968) pointed out that the entrepreneur is missing from traditional economic theory that stresses market equilibrium where normal profits have been competed away. He also posited that the entrepreneur is critical to economic theory. Kent (1989) noted the growth of entrepreneurial study over the decade of the 1980s but found that most of the written material comes from business management rather than the economics profession. It was particularly absent from principles texts. In a survey of 15 popular microeconomics principles texts, he finds that the entrepreneur is either missing, improperly, or incompletely explained. Kent and Rushing (1999) reviewed 14 popular texts and found, "that entrepreneurship still has not worked its way into economics principles texts." As noted above, a further review by Estill and Means (2019) of 27 common principles texts finds that some explanation of entrepreneurship and profits has made it into more than half of the texts, though accounting for entrepreneurial profit is only correctly represented in one - McConnell, Brue, and Flynn (2015). Present teaching often, "obscures, rather than clarifies, principles students' understanding of dynamic markets" (Estill & Means, 2019). Providing a deeper understanding of the traditional perfect competition model and how it relates to the role of entrepreneurship helps students better appreciate how markets drive growth.

We have used active learning techniques in our classrooms for many years. We find that utilizing both active and passive strategies better engages our students. In the present case, we combine physical activity (a walk) with story-telling, cooperative student work, seemingly

conflicting ideas, and idea synthesis.⁴ The method outlined below is a good introduction to the ideas of tacit knowledge, markets, and entrepreneurship for a principles class.

3. The Setup: A Random Walk Down San Fernando Street

After students arrive in the classroom, the instructor explains that the class is going on a walk. In our case we take them for a short walk (5 to 10 minutes) down San Fernando Street, the northern boundary of the SJSU campus. The instructor should *not* tell students they need to remember anything from the walk. At this point, students will probably be puzzled, but that is to be expected. We walk approximately six blocks along the street while talking about markets and entrepreneurs. While the subject is not critical, it provides a good warmup for what is to follow. On returning to the classroom, we ask students to individually write down one observation (depending on class size, this could be up to three observations) they noticed on their walk and hold it for later. Next, we introduce different conceptions of the market through the lens of the history of economic thought. On the one hand, there is the market as a process with an integral element of entrepreneurship. On the other is market equilibrium with rational expectations and the efficient markets hypothesis. How have these conceptions developed over time and how are they related? At this point, the instructor has the choice of using a standard lecture to follow the development of the theories. A more active approach is to divide the class into two groups to research and present each view of the market as the students see them. Another option is to divide the class into multiple groups using specific readings around each thought contributor to explain their contribution (as outlined in the following breakdown) while the instructor guides the students' findings.⁵ The idea in each case is to build stories around how complex ideas develop. While this takes some time and care, it actively engages students in the process. After exploring the idea developments, students can synthesize these two conceptions of the market. Are they compatible, and if so, how might they fit together? We end the class by asking the students to write on the board at least one observation from our initial walk.⁶ While there might be some overlap (e.g., some unusual occurrence noticed by more than one student), it will become clear how different the individual observations are. Few students have a similar memory and the list can be quite long depending on class size. This provides a basis for the class discussion about why and what this implies. Students come to realize that each of them has a unique, tacit mental framework. This framework allows each individual to focus on different facets of reality around them and provides a stage for understanding the role the entrepreneur plays in everyday markets (even inefficient ones) to see unique profit opportunities that evolve the economy to better satisfy human wants.

A. Entrepreneurship and the Market Process

Entrepreneurship has become a separate discipline in higher education with entrepreneurial programs in over 150 universities.⁷ The television show *Shark Tank*, where entrepreneur aspirants showcase innovative projects for potential funding, is in its fourteenth successful season with ABC. This has probably helped inspire entrepreneurship programs at many universities. These programs seek to teach students how to become an entrepreneur. But to better understand the entrepreneur, one should also understand how the concept of entrepreneurial action developed in economics and its importance in economic development.

In this lesson, we are not attempting to teach "how to become an entrepreneur" but rather follow the development of the theoretical role of the entrepreneur in contrast to the more traditional view of the market in perfect competition. The famous story of a \$20 bill on the

⁴ The level of student engagement in each element can be tailored by the instructor.

⁵ The instructor can tailor these authors as their time and interests permit.

⁶ For online classes, instructors can use a Google Jamboard or similar online resource effectively.

⁷ <https://www.bestcolleges.com/blog/going-back-to-college-for-entrepreneurship-degree/>

sidewalk suggests that markets are so efficient that there should be no bills lying about because someone would have already picked them up. However, others suggest there may be \$20 bills waiting to be noticed through unique, tacit knowledge. Kirzner (1997) notes, "The discovery of a profit opportunity means the discovery of something obtainable for nothing at all. No investment at all is required; the free ten-dollar bill is discovered to be already within one's grasp."

Political economists have struggled to explain why some countries are rich and some are poor. Recognition of the important role of the entrepreneur is attributed to three early writers: Richard Cantillon (1680s–1734), Adam Smith (1723–1790), and Jean Baptiste Say (1767–1832). Cantillon credits the entrepreneur as "the most active and central participant... who motivates the entire economic system." ([1755] 2010). He uses the word, entrepreneur, an adaption of the French "entreprendre," to convey "to undertake." Unfortunately, Cantillon's theories were generally lost to most English-speakers until rediscovered by William Stanley Jevons roughly one hundred years later. However, Smith was aware of Cantillon and mentions him in *An Inquiry into the Nature and Causes of the Wealth of Nations* ([1776], 1981). Smith uses the term "undertaker" as a person who undertakes a project and must be paid a profit to hazard his stock in an adventure. Jean Baptiste Say ([1880] 1971) further developed the concept of the entrepreneur as an intermediary who combines land, labor, and capital to meet the desires of consumers using market sense and, additionally, takes risks that create new and improved goods and processes (Koolman, 1971).

Others have since added to the evolution of our understanding of the role of the entrepreneur. Many of these economic thinkers have come from the Austrian school of economics which emphasizes individualism and subjectivism in a dynamic economic setting including Carl Menger, Ludwig von Mises, Frederick Hayek, and Israel Kirzner. Mainstream economists in the neoclassical tradition have also added to the theoretical understanding of the entrepreneur. Frank Knight (neoclassically trained with Austrian leanings), Joseph Schumpeter (also Austrian influenced), William Baumol, and others have expanded on our understanding with sometimes conflicting and/or nuanced understandings of the entrepreneur and the market process.⁸

Carl Menger (1840–1921) in *Grundsätze der Volkswirtschaftslehre (Principles of Economics)* published in 1871, develops the initial framework of the Austrian school of economics. His book identifies entrepreneurship as the primary agency of economic growth.

Ludwig von Mises (1881–1973) was heavily influenced by Carl Menger and further developed Austrian economics. Writing "Economic Calculation in the Socialist Commonwealth" in 1920, Mises noted that cost is simply the measure of relative scarcity, and there can be no cost structure without market exchange in prices. It is the competition over the ownership of productive resources that allows value (relative scarcity) determination. In *Human Action* Mises emphasizes that the market is not a place or a thing, but rather a process, "an interaction of men deliberately striving after the best possible removal of dissatisfaction." (Mises [1949], 1998). He views entrepreneurship as driving the economy toward equilibrium or the evenly rotating state of general equilibrium, an imaginary construct for methodological purposes (Hulsmann, 2018.) Of course this state is never achieved in the face of constant change. Later authors (Ritenour, 2023) see this as critical to economic progress.

Joseph Schumpeter (1883–1950) is best known for his discussion of the entrepreneur in Chapter Seven of *Capitalism, Socialism and Democracy*, "The Process of Creative Destruction." ([1942] 1976). Schumpeter's entrepreneur is the destabilizer that moves the static economic model forward. The only things missing here are the other elements of change driven by uncertainty of future events.

⁸This brief educational paper will, of necessity, leave out many other influences and interpretations of entrepreneurial activity. For a much deeper look at the economic history of the development of the entrepreneurial idea, see Hebert and Link's (2006), "Historical Perspectives on the Entrepreneur."

Frank Knight (1885–1972), an American economist, took on the challenge of change and uncertainty in his Ph.D. thesis, *Risk, Uncertainty and Profit* (1921). Following Cantillon, Knight recognized that entrepreneurs bear a certain kind of risk and are rewarded with profits. He identified three kinds of probabilistic risk. *A priori* probability deals with sets of events that are so alike that they can be estimated before happening (the throw of uniform dice). Statistical probability covers those events that lack the close similarity of *a priori* probability, but are numerous and have enough common features that as a class they demonstrate a regularity that can be measured even if undergoing some change through time (a building's exposure to fire). Finally, some estimates can only be made through expertise and intuition because they are either not numerous or do not have enough common features or both. These are the risks for which entrepreneurs earn profits or losses. He calls these uncertainties.⁹

Friedrich Hayek (1889–1992) wrote his seminal paper, "The Use of Knowledge in Society"¹⁰ in 1945, followed by "Competition as a Discovery Procedure" in 1968. Hayek had a strong Austrian economic background influenced by Menger and his followers. Hayek asks what one needs to create an effective economic system. He stresses the most important element is tacit knowledge, that knowledge of time and place that is personal, subjective, constantly changing, only available to each individual and never to any central planner. This evolving knowledge can only be discovered through competition in the marketplace over scarce resources.

William Baumol (1922–2017), was a mainstream economist who was greatly influenced by Joseph Schumpeter. He identifies the entrepreneur as the driver of economic growth, but notes that the entrepreneur is a missing person in the traditional equilibrium model (Baumol, 1983). He differentiates three different types of entrepreneurship: productive, unproductive, and destructive. He posits that the distribution of entrepreneurship is greatly affected by institutions, the rules of the game (Baumol, 1990). While Baumol's neglect of the Austrian/Public Choice literature¹¹ limits the value of his conceptual model, these contributions to the understanding of entrepreneurship still broaden the field.

Israel Kirzner (1930–present) closely follows Menger's, Hayek's, and Mises' influences on entrepreneurship and has spent his career exploring the role of the entrepreneur. Among several important contributions to the understanding of entrepreneurship are his development of the characteristics of entrepreneurial alertness, the differentiation of types of entrepreneurial action, and the reduction of market ignorance that is equilibrating (versus Schumpeter's disequilibrating model). Kirzner finds that the insights developed by Mises (the market as a process) and Hayek (the market as a knowledge discovery process) have led him to a more coherent understanding of the market process, the market is a knowledge discovery process driven by entrepreneurial competition over scarce private resources. This competition reduces market ignorance as entrepreneurs buy undervalued resources to sell at higher prices. By reducing this ignorance, entrepreneurs push the economy closer to the equilibrium of given means for constantly evolving ends. Those who earn profits gain resources and those who do not, lose resources (Kirzner, 1972). This entrepreneurially-driven, knowledge discovery process creates economic progress (Ritenour, 2023).

The authors are aware that there are many nuances and disagreements about the foregoing ideas, as well as additional developments. However, for this paper, the abovementioned is a general guide to the understanding of the entrepreneur as the driver of economic growth. But, if the economy grows by this entrepreneurial-driven market process, does this contradict rational and efficient market theories where markets respond quickly

⁹ Later authors further break uncertainties into two categories, uncertainty and radical uncertainty. (Hebert & Link, 2006).

¹⁰ Named one of the 20 most influential papers published in the *American Economic Review* during its first hundred years.

¹¹ Without the Austrian/Public Choice models as a foundation, he fails to develop a sophisticated theory of modern political entrepreneurship.

eliminating profit opportunities? To answer this, a brief explanation of the traditional perfect competition model with rational expectations and efficient market theories is useful.

B. The Rational Expectations and Efficient Market Theories

Modern principles texts have traditionally taught much of their theory based on the perfect competition model in equilibrium where entrepreneurial profits have been competed away. There is no longer any market process; everyone's subjective knowledge and expectations have converged. This static model of competition has spurred other theories about economic actors' behaviors. One of these is that economic actors make decisions based on expectations guided by past experience. They generally understand their economic framework and rapidly adjust their behavior accordingly. In more recent writings, this idea has been expanded to include expectations of future trends. Another allied theory is that markets are generally efficient. When information is relatively robust, markets readily aggregate available information, noticing and eliminating price discrepancies (and profits) quickly. There are no opportunities (\$20 bills) left lying on the ground.

Expectations have a long history in economic thought in both the traditional model and Austrian economics.¹² In the traditional model, equilibrium occurs when the endogenous variables of price and quantity have converged to a single set of values. Expectations are one of the exogenous variables (along with tastes, technology, population, time, shocks, and other things) outside of the equilibrium values of P and Q in perfect competition. Changes in the exogenous variables move the economy from one equilibrium toward another. Austrian economists, on the other hand, argue that human action is never static and to view it as such obscures the dynamic nature of human action. Expectations are always *forward-looking* as each individual seeks to better their current situation when they act.

In the mid-twentieth century mainstream economists began looking more deeply into how expectations form. The financial theory that stock prices change randomly (the random walk theory) has been around in several forms for nearly 100 years. However, the term was made popular by Burton Malkiel's 1973 book, *A Random Walk Down Wall Street*. This idea suggests that one cannot out guess the market. It became an underpinning for investing in broad, low-cost index mutual funds. Additionally, it provides support for the idea of rational expectations theory and the efficient market hypothesis.

In 1961 John Muth published an article, "Rational Expectations and the Theory of Price Movements" that helped clarify the way neoclassical economists viewed expectations. According to Muth (1961), while stock market prices move randomly based on new information, one might, under specific circumstances, successfully predict outcomes. Muth (1961) wanted to explain two observed phenomena: 1) "Averages of expectations in an industry are more accurate than naïve models and as accurate as elaborate equation systems," and 2) "Reported expectations generally underestimate the extent of changes that actually take place." Muth (1961) determined that in robust capital markets, if economic actors are rational in the broadest sense, they use reason and logic to try to improve their situation. Using both past experience and access to relevant information, the distribution of their subjective expectations will closely match a predictive objective distribution model. However, he added some caveats about his theory, "we assume: 1) The random disturbances are normally distributed, 2) Certainty equivalents exist for the variables to be predicted, and 3) The equations of the system, including the expectations formulas, are linear" (Muth, 1961). Later economists extended Muth's theory beyond capital markets and suggested experience of the past can affect future outcomes and using rationality, current information, and past experience, economic actors can make generally accurate predictions of the future.

The idea of market efficiency has existed at least since the publication of Charles A.

¹² See Hoover and Young (2013) for a more detailed history of these mainstream contributions.

Conant's (1904) *Wall Street and the Country: A Study of Recent Financial Tendencies*. Conant, a financial expert, explained how speculators through their competition create prices not only for the present, but also for the future that others can use for their speculation. While he did not call it "efficient markets" he did foreshadow the idea (Hoover & Young, 2013). Eugene Fama (1970), a University of Chicago economist who specialized in finance, studied CRSP data¹³ and published "Efficient Capital Markets: A Review of Theory and Empirical Work." He argues that the capital market's primary role is to provide accurate prices for resource allocation. A market is "efficient" when it fully reflects all current information. He found that CRSP prices did fully reflect new data. Thus, in robust markets where relevant information is readily available, prices (at least in these capital markets) fully reflect present and future values based on expected returns and one cannot generally find arbitrage opportunities since they have already been competed away. This sounds very much like the static neoclassical model of perfect competition where entrepreneurial profits have already been competed away. So, given rational expectations and efficient markets, how is it possible for entrepreneurs to find profit opportunities and innovate?

4. A Solution to the Apparent Paradox

Are markets generally robust with readily available, relevant information? If so, prices ought to converge toward single values with zero profit. But, in lightly traded or developing markets, this need not be the case. Here lie entrepreneurial opportunities. To put this in perspective, one can return to Hayek's (1945) article "Use of Knowledge in Society." He opens the paper with a simple question: "What is the problem we wish to solve when we try to construct a rational economic order?" If we had all of the information we needed, there would be no problem. The solution would be a simple logical use of that information. But in everyday life, this is not to be, "...the 'data' from which economic calculus starts are never for the whole society 'given' to a single mind... and can never be so given" (Hayek, 1945). That data is not scientific knowledge that can be easily passed from person to person, but rather the tacit knowledge of time and place that is specific to each individual. It is subjective, internal (who knows what you want?), and constantly evolving. It is this tacit knowledge of individual ends for which the limited means at hand must be organized. Some markets are characterized by robust information with a multitude of actors that tend to make price movements reflect the conditions outlined in rational expectations and efficient markets, and these provide a fertile ground for financial professionals. However, if one returns to Muth's (1961) clarifying assumptions of 1) The random disturbances are normally distributed, 2) Certainty equivalents exist for the variables to be predicted, and 3) The equations of the system, including the expectations formulas, are linear, we can see the problem. While these assumptions may apply to well-developed capital markets, they are not what most people experience day-to-day.¹⁴ Repeat trading in well-developed markets can lead to convergence toward equilibrium. An activity used to demonstrate this is a simulation from the Foundation for Teaching Economics entitled "In the Chips" (<https://www.fte.org/teachers/teacher-resources/lesson-plans/eflessons/in-the-chips-a-market-in-computer-chips/>) that one of the authors has used successfully to demonstrate (1) convergence and (2) prices require co-determination by buyers and sellers.

However, as Mises ([1920] 1990) pointed out, prices do not arise without competition by entrepreneurs over control of private resources in the face of uncertainty and constant change. Additionally, as Hayek (1968) noted, just as one cannot know the outcome of a ball game until it is over, the results of resource competition can only be known when exchange takes place. Predictions may be poor indicators when faced with market ignorance of future value in thinly traded and evolving markets. Entrepreneurs reduce ignorance by bidding for resources in search of profit. Profit represents the value individuals place on goods and services above their

¹³ CRSP (Center for Research in Security Prices) data is an extensive database of historical stock prices that became available in the 1960s using early computers.

¹⁴ While capital markets may have extended periods of probabilistic certainty, there can be episodes of radical uncertainty as during the 1929 Great Depression, 1987 Black Monday, or more recently, the coronavirus crash of 2020 and the Ukrainian invasion.

cost of production. Those entrepreneurs who are more knowledgeable about consumer wants earn profits and can acquire more resources. Those who are not suffer losses and lose resources. The competitive, entrepreneurial market is a self-healing, ever-evolving system. Note that this system and the equilibrium, efficient market with rational expectations are separate ideas. The entrepreneurial-driven system complements rational expectations and efficient market theories by offering a missing element to equilibrium analysis. That analysis has no explanation for economic progress. Random movements need not move the economy in any particular direction. However, the entrepreneurial effort can move the economy forward as profit-seeking entrepreneurs remove market ignorance and bring the limited means at our disposal closer fulfilling our evolving unmet ends.

5. A Simple Demonstration of Unique Perception

Imagine something as simple as shopping at the supermarket. How often does one buy only what is on their shopping list? Were this the case, all the expensive displays, packaging, and advertising would be of little value. Entrepreneurs must compete for customers, as well as resources. And this competition is always forward-looking. What do people want that they do not currently have? It is this search for what people want more, even at times when they do not know themselves, which drives economic growth. This system often does not work like a probabilistic, well-informed random walk, where profits disappear quickly as if they were lying in plain sight. Rather, entrepreneurial profits are the product of the unique, tacit knowledge of time and place that each individual possesses, never available to any single mind. The central planner can only look to the past for price confirmation, while the entrepreneur is always looking into the future for a profit opportunity. Individual tacit knowledge evolves constantly in every human mind, giving each person a unique perception of the world and its opportunities. The Kirznerian (1997) idea is that the recognition (discovery) of a profit opportunity requires only tacit knowledge. To return to his earlier quote, "The discovery of a profit opportunity means the discovery of something obtainable for nothing at all. No investment at all is required; the free ten-dollar bill is discovered to be already within one's grasp."

After covering these different, evolving conceptions of the entrepreneur, we ask students to write on the board individual recollections of their initial walk down San Fernando St. We generally get a myriad of different memories. These recollections can include what they saw (a large pine with the top cut off), what they heard (sirens downtown), and how they felt (it was a warm day). Students are surprised at the different perceptions those around them experience. We have even had students propose business opportunities from their random walk. One student saw an empty storefront that he thought might be good for a boba shop. Reviewing the experiences can spark interesting discussions about seeing things that others do not notice that stick with students. Just referring to the walk down San Fernando St. in later classes gets a positive response from students who participated. They can more easily appreciate the idea of constantly evolving, tacit knowledge that is individually unique. When thinking about entrepreneurship and the market process, they can now explain why one might see opportunities (\$20 bills) that are invisible to others. An interesting experiment if the instructor has sufficient time would be to repeat the walk over several days and see if there is any convergence in what students note.¹⁵

6. Conclusion

The role of the entrepreneur in the market economy is a critical element for understanding growth economics and should be included in economic principles classes. There are numerous popular online resources such as <https://www.hbo.com/silicon-valley>, www.econshark.com, <http://fee.org>, <https://www.learnliberty.org>, <https://mru.org>, and <https://stosselintheclassroom.org>, as well as many others that can be used to complement classroom instruction of

¹⁵ The authors thank an anonymous referee for this added element.

entrepreneurship. The discussion of aspects of entrepreneurship is particularly appropriate for the walking exercise. It is a simple way to have students recognize their unique, personal knowledge and understand how they, like entrepreneurs, may see opportunities not apparent to others. We recommend that instructors take their students for a walk since students are more engaged when they are up and moving. However, instructors have the option of simply having students view a video clip of a walk and using it for an open-ended discussion. Students find the walk provides an engaging launchpad that is easy to remember. Additionally, it is an efficient way to begin to transition students' mindsets to a more open view of their capabilities and opportunities.

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