Simple and Intuitive Business Practices in Financial Economics

Itzhak Ben-David*

July 24, 2021

Abstract

In stark contrast to the sophisticated methods advocated by academics in business schools, actual business practices are typically simple and intuitive (e.g., valuation, debt management, compensation). This article argues that methods that have these characteristics are more likely to become widely used business practices for two reasons. First, they are less prone to overfitting to a particular setting and therefore are robust across economic environments and applicable in new settings. Second, they are easy to communicate and are verifiable. They, therefore, can spread easily across organizations and are hard to replace with new and improved methods. This explanation of business practices can help resolve puzzles in corporate finance (e.g., variation in debt leverage across industries).

Keywords: Decision making, rules of thumb, heuristics, robustness, business models
JEL Classification: G12, G14, G15

*The article benefited from comments by Justin Birru, Andrew Ellul, John Griffin, Florian Heider, Jack Liebersohn, Rabih Moussawi, Aner Sela, Andrei Shleifer, René Stulz, and Michael Weisbach, as well as seminar participants at the University of Wisconsin and Goethe University. Email: ben-david.1@osu.edu.

The Nature of Management Practices

A disconnect exists between the content taught in business schools and the methods practiced in the industry. For example, in a basic finance class, students learn how to evaluate a project using net present value (NPV), compute the cost of capital of a firm, and calculate optimal leverage. These methods are based on sound economic fundamentals such as no-arbitrage, market equilibrium, and optimization of some objective that managers should care about. In the real world, however, only a few managers use these techniques (Graham and Harvey, 2001), despite the high prevalence of business education.[1] Most managers, it appears, pursue practices that have been in existence for decades, if not centuries. While these methods are often dismissed as being suboptimal by academics, they are simple and intuitive. What makes these practices survive in a fast-evolving business environment?

The business world is rife with examples of decades-old business practices that are suboptimal in the eyes of academics. In corporate finance, we teach our students that interest tax saving is the most important consideration when deciding on corporate capital structure. Managers, however, largely ignore this prescription (Graham, 1996; Graham and Harvey, 2001). In practice, executives issue either debt or equity securities according to whichever appears to them less costly at the time (Baker and Wurgler, 2002), despite learning in business school that the market is generally efficient and financial claims are priced right in equilibrium. Another example relates to capital budgeting and valuation. The standard way that we teach our students to evaluate a project is by using NPV. One needs to estimate a cash flow as well as an accurate discount rate that accounts for systematic risk. Sometimes we teach our students even more nuanced methods that account for the distribution of cash flows in a Monte Carlo simulation or a real options framework. In the real world, however, most executives, both in large and small firms, use simple methods like the payback period or

[1] For example, *U.S. News* reports that as of 2012, 200 of the Fortune 500 CEOs held a Master's of Business Administration (MBA) degree. See Menachem Wecker, "Where the Fortune 500 CEOs Went to School," *U.S. News*, May 14, 2012, `http://www.usnews.com/education/best-graduate-schools/top-business-schools/articles/2012/05/14/where-the-fortune-500-ceos-went-to-school`.

hurdle rate to assess whether a project is worth taking, irrespective of project risk (Graham and Harvey, 2001).[2] We also teach our students that price-to-earnings (P/E) and dividend yield ratios do not contain information about the prospects of a stock or its risk; yet, investors frequently use these variables to select investments.[3] Pinto, Robinson, and Stowe (2019) surveyed nearly 2,000 members of the Chartered Financial Analyst (CFA) Institute about the methods that they use to value equities. The authors report that 93% of analysts use multiples analysis (primarily the P/E ratio), 79% use NPV, and only 5% use real options valuation.

This article offers an explanation for the prevalence of simple and intuitive business practices. At the core of the argument is the idea that observable business practices are those that have survived over time among all methods that have been proposed and used. Over time, business practices that deliver better results are more likely to continue to be used and also to be copied by other organizations, e.g., through social networks or executives jumping ship. Practices that have not worked well in the past are replaced with new ones.

But why are simple and intuitive methods the ones that become widely used in business? The article argues that these very features—simplicity and intuitiveness—give such methods important survival advantages. Simple methods are those that have one or a small number of parameters; as such, they are easy to communicate, follow, and monitor. Intuitive methods are those that are aligned with a first approximation for the solution to the problem they strive to solve, and therefore they are likely to capture the goal of the task at hand.

Simple and intuitive methods are more likely to survive over time for two reasons. First, to remain relevant over time, methods need to be robust in new economic environments and be applicable across new business situations. In other words, they are not tailored to solve a very specific or unique business problem. Simple methods are less prone to overfitting,

[2] To illustrate the antiquity of some of the methods used in the business world, consider the following terms still widely used to value assets. According to `www.newspapers.com` archive, *payback period* was first mentioned in a valuation context in 1975, *hurdle rate* in 1975, *cash multiple* in 1921, *investment multiple* in 1950, and *capitalization rate* in 1893.

[3] According to `www.newspapers.com` archive, *price-earnings ratio* (or *earnings ratio*) was first mentioned in the context of stock selection in 1924, and *dividend yield* in 1879.

which occurs when a solution to a problem is designed based on a specific sample and therefore embeds noise into the solution, which makes it inapplicable outside of the specific sample. Because simple methods have very few parameters, they are less likely to capture noise. Furthermore, methods that are intuitive are more likely to address the essence of the problem at hand, and therefore to provide a solution that works. In the econometrician's terminology, they work out-of-sample.

The second reason for the success of simple and intuitive methods is that they are easy to communicate between individuals, within organizations, and across organizations. Within organizations, simple and intuitive methods allow managers to instruct employees and employees to report back to managers. Across organizations, simple and intuitive methods are more likely to lead to the formation of an industry lingo. Furthermore, once external organizations like suppliers and customers speak the lingo, it is easy to verify information and communicate. Simple and intuitive methods can also be imitated with little trouble; hence, they spread rapidly across organizations. The flip side of being an efficient way to communicate is that simple and intuitive methods are very sticky, meaning they are hard to replace even in the face of new and improved methods. Some business practices, therefore, may reflect antiquated and sub-optimal methods that are too difficult to update because of organizational frictions.

Several articles have attempted to explain the emergence of simple and intuitive business practices. Economists are split between those who believe that actual business practices are suboptimal, often leading to unintended consequences (e.g., Krüger, Landier, and Thesmar, 2015), and those who argue that business practices are the result of an optimal mechanism design, where executives choose simple methods because they are optimal subject to constraints (e.g., bounded rationality, likelihood of overfitting) (Baumol and Quandt, 1964; McDonald, 2000; Gabaix, 2011; Al-Najjar and Pai, 2014; Schwartzstein and Sunderam, 2019).

Competition of Methods

How do methods become business practices? One potential mechanism is through competition. Imagine two competing firms that use different methods for capital budgeting for new projects. If the method used by one firm (the "efficient firm") leads to better managerial decisions over the long run, the method it uses may become the dominant business practice in the market through several mechanisms. For instance, the efficient firm with better decisions is more profitable, on average, and over time dominates the market. Alternatively, the less efficient firm might recruit executives from the efficient firm and mimic its methods. It can also learn about the efficient method through conferences, trade magazines, or board affiliations. Finally, the method can spread through the market for corporate control: The efficient firm acquires the inefficient firm and implements its superior methods. This hypothetical example demonstrates that new and efficient methods indeed can spread and become business practices. Therefore, it is even more puzzling why industries seem to be stuck for many decades with methods that appear to be very simple.

A few powerful examples demonstrate how new methods are developed in organizations and spread across the industry. One well-known case is the DuPont analysis, which analyzes firm performance by examining financial statements. One of its versions decomposes the return on investment (ROI)[4] into its sources within the organization. This simple analysis uses accounting statements to identify whether the ROI of a business unit is driven by factors like profit margin, asset turnover, and the like. It allows managers to identify the areas in which their businesses are at a disadvantage. The analysis was first proposed in 1912 in an efficiency report by Donaldson Brown, an explosives salesman at DuPont. The method spread quickly across firms and became a standard way to analyze efficiency in many industries. For decades, the DuPont analysis has been an integral part of the toolkit used in financial reports analysis. Another example of methods originating in businesses and

[4]See Matt Philips, The DuPont invention that forever changed how things work in the corporate world, *Quartz*, 9 December 2015; available at `http://qz.com/569738/the-dupont-invention-that-forever-changed-how-things-work-in-the-corporate-world/`.

spreading throughout the industry is the use of Japanese floor-level management techniques in the 1980s such as lean manufacturing, called Kaizen and Kanban (e.g., Shah and Ward, 2003; Drucker, 2012). Other studies show how quality methods expand through an industry (e.g., quality control methods (Guler, Guillén, and Macpherson, 2002), accounting methods (Reppenhagen, 2010), environmental policies (Schiller, 2017)). These methods spread across firms through business education, consultants, and linkages such as migration of executives across firms, board interlocks, and customer-supplier relationships.

The idea that new and efficient methods spread quickly through firms in a competitive industry should raise no eyebrows among economists, who tend to embrace the idea that markets are competitive enough that technology transcends across firms (for example, Aghion and Howitt, 1992; Nelson and Winter, 2009; Schumpeter, 2013). Farmer and Lo (1999) and Lo (2017) propose that asset markets become efficient as traders use trading rules that compete and survive in a manner similar to that of biological organisms. Brennan and Lo (2011) propose a model in which characteristics of agents survive from one generation to the next if they provide the agent with a survival advantage in a given environment. They argue that many observed behaviors, such as risk or loss aversion, can be explained by this evolutionary mechanism. In the fields of sociology, economics, and finance, researchers have found that corporate policies are transmitted through competition and through social networks (see Davis and Greve, 1997; Scott, 2013). The examples of the DuPont analysis and Japanese floor management techniques demonstrate how certain business methods became dominate in industries through superior performance, imitation, or acquisition. With new startup businesses popping up all the time, and executives hopping from one business to another, one would expect that inefficient decision rules would disappear rather quickly.

Which Methods Become Business Practices?

Necessary Conditions: Simplicity and Intuitiveness

How does one explain the status quo of business practices? Perhaps some methods have a better chance of becoming business practices than others. In particular, two characteristics are critical for the success of business methods: simplicity and intuitiveness. Together, these characteristics allow business practices to perform reasonably well and at the same time to become sticky and hard to replace. Simplicity and intuitiveness are related qualities with some differences.

Methods are considered simple when they have a small number of parameters (often one). They are usually based on the first moment only, even when applied to uncertain environments. Methods that are intuitive use an idea that is instinctive and often reflect the general business objective. These are typically the first solution to the problem that one could think of. Put differently, they are typically aligned with the task at hand and often reflect wishful thinking: higher sales, greater profits. Therefore, business practices aligned with business objectives motivate managers and employees to increase sales, minimize expenses, increase profitability, and minimize risk. When a business practice is correlated with a business objective, the decision maker is focused on the most important aspect of the designated task.

Many widely used business practices are simple and intuitive. One example is performance-based compensation contracts. Executive compensation contracts are typically written based on sales or profits; for lower level employees, compensation is often defined as a percentage of sales (see Bénabou and Tirole, 2016). These contracts are simple and intuitive, and are easy to communicate, measure, and monitor. Importantly, these contracts are often linear in the variable of interest (e.g., sales). While they can be explained as an optimal outcome (e.g., Holmstrom and Milgrom, 1987), they do, at times, have unintended consequences that

could prove detrimental.[5]

A second example is account-based profit calculations. In the property and casualty insurance industry, many firms strive to ensure that each account breaks even. If a house is struck by lightning and the roof requires fixing, next year's premiums are likely to increase (Werner and Modlin, 2010). Although this practice may seem to be driven by narrow framing (Thaler, 1999), it is a way to ensure that the marginal profitability of accounts is positive. It feels natural to employees (who wants to keep a losing account?) and can be easily communicated to customers. In other industries such as construction, firms use a "cost-plus" pricing method in which they transfer costs (plus a margin) directly to their clients, avoiding the need to worry about account-level profitability.

Another area in which the existing business practice is simple and intuitive is debt covenants. It is widely agreed among academics that lenders often impose debt covenants that serve as an early warning signal (trip wire) of whether the borrowing firm will be able to make debt payments (Dichev and Skinner, 2002; Demiroglu and James, 2010). As such, debt covenants measure the relation between the firm's liquidity and its debt payment commitment. For instance, a lender may require interest coverage to be greater than three (earnings before interest and taxes (EBIT)/interest expense). This measure is not a perfect predictor of the firm's ability to pay the interest, but it is correlated with its ability to do so.

Interestingly, simplicity sometimes borders on naiveté, as business practices reflect, at times, wishful thinking about the ultimate goal such as making a profit. For example, a compensation contract for a salesperson may be based on a percentage of sales because the objective of the business unit is to generate sales (as opposed to conditioning it on the profit-per-unit it generates). A stock trading rule that a trader should sell only the stock position

[5]Such compensation contracts may generate unintended consequences. Levitt and Syverson (2008) show that contracts for residential real estate agents (percentage of the sales price) create the incentive to sell homes quickly, potentially not realizing all potential gains for sellers. Agarwal and Ben-David (2018) study an incentive-based compensation contract in the banking section in which loan officers are compensated with a percentage of the sales volume. They find that the implementation of this contract was associated with a dramatic increase in approval rates because loan officers emphasized good hard information and discounted negative soft information.

in profit reflects the objective of the trader—to make a profit.

The Advantages of Simple and Intuitive Methods

Out-of-Sample Robustness

For a method to become a business practice, it needs to perform sufficiently well over the long term; otherwise, it would have been replaced. It need not dominate all alternative methods in every situation or application, but it must perform reasonably well over time and across applications. For instance, a valuation method should be reliable during both boom times and recessions. Furthermore, a method that is useful in different applications would have an advantage. For example, a versatile method that could produce valuations for different types of income-producing assets is more likely to be embraced by the industry than a method designed to assess the value of warehouses only.

More broadly, business methods can be thought of as solutions to complex business problems. As such, a solution tailored to the specific circumstances of a very distinct situation may not be applicable to other business situations. This problem is known as overfitting in statistics and machine learning (Hurvich and Tsai, 1989). The issue is that the model may provide an accurate description of a system in-sample but may perform poorly out-of-sample. In a meta-analysis of the literature on forecasting rules, Gigerenzer and Goldstein (1996) conclude that simple forecasting rules generate as good or better predictions than knowledge-intensive rules. Al-Najjar and Pai (2014) and Schwartzstein and Sunderam (2019) present theoretical models in which decision makers resort to a simple model to solve a problem to avoid overfitting.

Overfitting is the prime concern when implementing predictive models. Specifically, a predictive model can work well in training data but perform poorly when run on out-of-sample data. There are many examples of model overfitting in business. Rajan, Seru, and Vig (2015) show that credit models used by lenders in the early 2000s were poor at predicting borrower default in the housing bust of 2007–2008. Agarwal and Ben-David (2018) find

similar evidence for the implied credit model used for small business lending; the model was fitted to a particular group of loans and had little predictive power over a new set of loans. Welch and Goyal (2007) present evidence that asset pricing models that were calibrated in-sample do not have meaningful explanatory power out-of-sample.

Stickiness

Methods that are simple and intuitive are also hard to change, even if they are inferior. Simple and intuitive information is easy to process and easy to communicate, which makes such methods appealing and commands high switching costs.

Organizations rely on both internal and external communication and monitoring. Simple and intuitive methods can facilitate communication and monitoring and therefore have a survival advantage even when alternative methods are marginally better. Specifically, simple methods are easy to communicate to related parties such as employees and unsophisticated capital providers. In some industries, simple methods may result in an industry lingo that facilitates transactions and lowers transaction costs. For instance, Drexler, Fischer, and Schoar (2014) document that simple rules of thumb are a more effective way to communicate accounting practices to entrepreneurs than standard accounting training.

Stickiness is related to the sociological theory of punctuated equilibrium (e.g., Gersick, 1991; Romanelli and Tushman, 1994; Van de Ven and Poole, 1995). It explains why organizations keep the same processes and methods without further developing them. The crux of the theory is that once the organization functions at a reasonable level, it requires a shock to trigger a change. Furthermore, some studies in psychology suggest that executives learn slowly about which methods work and which do not. Kahneman and Lovallo (1993) argue that executives do not learn from their past experiences because of the infrequent nature of their decisions. Langer and Roth (1975) present laboratory evidence that individuals tend to attribute successes to their own past decisions and blame bad luck for failures. While these factors can keep managers from improving their methods, competition among industries is

likely the catalyst behind learning and adapting through improved methods. Differently put, the switching cost in organizations is high, and without a pressing need, executives are not compelled to make such a switch.

Switching to a superior method may be costly on several fronts. Simple and intuitive methods and the lingo that they create also facilitate communications with capital providers. It is easier to attract the attention of a busy real estate investor with information about a commercial property that yields an 8% cap rate (which is a bargain because the market is at 7%) than by sharing the results from a Monte Carlo simulation. Another factor that impedes switching to new methods is irreversible investment, which applies to some methods. For example, driving on the left side of the road is an arbitrary decision in some Commonwealth countries. Switching to right-hand-side driving, however, would be very costly. Finally, simple and intuitive methods are portable: They are easy to copy and hard to protect. It is easier to (try to) mimic Warren Buffet by looking for a winning management team[6] than to run a real options analysis.

Tradeoff between Stickiness and Optimality

The robustness and stickiness that characterize surviving business methods create forces that pull in opposite directions. Robustness means that methods succeed in new economic environments and therefore are likely to endure. Stickiness helps preserve existing business methods even when they are suboptimal by blocking competing, potentially more efficient new methods from taking hold.

In recent years, some industries have attempted to replace business practices. One example is the commission structure of real estate agents in the residential market, which has been historically 6% of the house value, split between the seller's and buyer's agents. Levitt and Syverson (2008) argue that this contract is likely to be suboptimal as it incentivizes the seller's agent to close the transaction quickly and places little weight on the sales price

[6]See `http://www.businessinsider.com/warren-buffett-investing-rules-2015-6`.

that the broker achieves. Recently, new brokerage houses have attempted to offer an alternative contract under which real estate brokers are paid an hourly fee rather than a fee based on success (e.g., Redfin). These services have not captured significant market share, likely because the traditional 6% contract involves contractual agreements between several parties—the seller, the buyer, and two agents—making it difficult to replace and therefore sticky.

Because stickiness is effectively a barrier to entry for competing methods, an industry may be stuck with a suboptimal method because the switching cost is too high. In such a case, without sufficient improvement in the value to all participants or a coordinated initiative, there will be little incentive to move toward a competing method that is better.

Extinct Practices and Unsuccessful Improved Methods

The idea that methods become business practices if they are simple and intuitive as long as they overcome the stickiness of prior practices and work sufficiently well "out-of-sample" can be demonstrated through specific examples. The first set of examples shows that some business practices works well for a while, but were replaced after they failed the "out-of-sample" test—i.e., did not perform well in new economic conditions. The second set of examples shows cases of methods that work well on paper, but are not simple or intuitive enough, and therefore have never gained traction in the industry.

Extinct Practices

One way to demonstrate the environmental pressures that business practices undergo is to examine practices that were in use in the past and have disappeared. Understanding the reasons for their disappearance can help corroborate (or reject) the evolution argument. Here are a few examples.

A major implication of the robustness characteristic is that business practices that do not

perform sufficiently are replaced by alternative methods. This is likely to happen following a crisis, when some methods that no longer work as well as they did in the past are re-examined. There are several recent examples of methods that did not perform in a crisis. In the late 1990s, many of the dot.com firms did not have cash flows or event forecasts of cash flows. Consequently, investors and analysts started using valuation measures that were not based on cash flows. One example was eyeballs, which is a valuation multiple of the number of visits to a website. The idea was that firms that operate websites that attract more traffic should have higher valuation, even though they do not have a business model that produces cash (Trueman, Wong, and Zhang, 2000; Liu, Nissim, and Thomas, 2002). After many of these firms went bankrupt in the dot.com crash in 2000, investors and analysts stopped using the eyeballs measure.

The dot.com era also gave rise to tracking stocks. These are securities that track the performance of a business unit within a corporation. Unlike common stock, tracking stocks typically have no voting power or claims on cash flows. In the late 1990s, companies issued tracking stocks to track their technology divisions (e.g., Walt Disney Company, AT&T, Sprint Corporation). In the wake of the stock market crash in early 2000, these stocks stopped trading and disappeared from the market.

The Global Financial Crisis of 2008 provides additional examples. In the period leading up to the crisis, many lenders relaxed their lending rules. Traditionally, lenders have been concerned with the ability of borrowers to repay their debt and with the value of their collateral. As such, lenders require borrowers to have a certain debt service-to-income (DTI) ratio and limit their loans to achieve a certain loan-to-value (LTV) ratio. Historically, these ratios have been set to provide a certain default profile; given a set of DTI and LTV, a lender should expect a percentage of borrowers to default over time. At the same time that the real estate market was booming in the late 1990s and 2000s with corresponding low default rates, lenders relaxed their DTI requirements, which allowed more highly leveraged borrowers to take out mortgages. For example, only 12% of Fannie Mae's borrowers had a

DTI higher than 42% in 1997, compared with 43% exceeding the 42% threshold in 2007.[7] Once the Global Financial Crisis hit, the fraction of borrowers with DTI higher than 42% dropped to 23%. Since the 2008 Financial Crisis, lenders continue to use DTI as a predictor of borrower default; however, they have revised the threshold parameter downward because the earlier parameter did not prove to be robust to the economic environment. Furthermore, during the boom, many lenders relaxed the income verification requirement and offered a class of new alternative mortgage products, such as liar loans (where income is stated by the borrower; Jiang, Nelson, and Vytlacil, 2014) and NINJA loans (no-income-no-job-or-assets). After these mortgages were the first to default as the direction of the market changed, lenders reverted to the old and reliable lending criteria that had been in use for decades before.

Another example comes from the regulation of banks. Prior to the crisis, bank regulators in the U.S. required banks to monitor and limit their value at risk (VaR), a measure of portfolio variance based on historical variance and correlation among assets. The model failed during the Global Financial Crisis as asset volatilities and correlations behaved differently than their historical statistics (Triana, 2009).[8]

In both examples, regulators played an important role in eliminating methods that have proven unsustainable. However, regulation generally does not preempt failure of business practices, as regulation is usually counter-cyclical, and acts after-the-fact in response to crises or demand for scapegoating (Hirshleifer and Teoh, 2017).

Methods That Did Not Succeed: Neither Simple Nor Intuitive

The business world also has many examples of methods that could bring value to their users but have not caught on, potentially because they are not clearly correlated with the objective of the business unit and thus not intuitive. Consider, for instance, the second-price auction. Research shows that in many settings second-bid sealed bid auctions generate the

[7] See Consumer Financial Protection Bureau's call for comments on Regulation Z (Truth in Lending): `http://files.consumerfinance.gov/f/201205_cfpb_Ability_to_Repay.pdf`.

[8] See also Nassim Taleb, Against Value-at-Risk: Nassim Taleb Replies to Jorion (1997) on `http://www.fooledbyrandomness.com/jorion.html`.

highest revenue for the seller (Vickrey, 1961). However, this method is rarely, if ever, used. The reason is likely that such an auction does not feel intuitive to the user because the price paid by the top bidder is not the highest price.

Short selling and hedging are two other examples. The concept of short selling is often difficult to grasp because it is counter-intuitive: How can one make a profit when the value of the asset declines? This difficulty may explain why retail traders are reluctant to take short positions in stocks (Odean, 1999; Barber and Odean, 2007). A related difficult-to-understand concept is hedging. This lack of intuitiveness may also explain why the market for futures on a residential housing index (Case, Shiller, and Weiss, 1993) established at the Chicago Mercantile Exchange in 2006 has never attracted much investor interest (Hinkelmann and Swidler, 2008; Kroszner and Shiller, 2011; Fabozzi, Shiller, and Tunaru, 2020).[9]

Another example of an unintuitive method that did not catch on despite its clear advantages is risk sharing through shared appreciation mortgages (SAM) for residential homeowners. The idea is that the lender shares some of the appreciation of the home value at the time of sale in exchange for a lower interest rate. These mortgages were originated by some lenders in the 1990s in the United Kingdom but have never caught on to become a mainstream product. Similarly, Posner and Zingales (2009) proposed a solution to the mortgage default wave of 2007–2008 based on profit sharing; however, the proposal has never gathered sufficient traction.

Alternative Explanations

Several alternative explanations could account for why managers use simple and intuitive methods. These arguments fall into two broad categories: those claiming that the current practices are already optimal and those that suggest that the current practices are suboptimal and could be improved.

[9]Of course, it possible that there was no demand for the product. One still wonders why households are willing to have high exposure to real estate prices, when rent is only weakly correlated with prices (Hill and Syed, 2016; Begley, Loewenstein, and Willen, 2019).

"Existing Business Practices Must Be Optimal."

If business practices survive because they are optimal, then they are not a result of an evolutionary process but rather were designed and chosen because of their optimality. Al-Najjar and Pai (2014) and Schwartzstein and Sunderam (2019), for example, propose a model in which decision makers need to pick a decision rule. Because they are concerned about overfitting, they pick simple rules that work out-of-sample. In a similar vein, McDonald (2000) uses simulation results to show that simple valuation rules (e.g., payback period) produce results that are highly correlated with the results of a real options model.

If business practices were not "chosen" because they were optimal, perhaps they evolved to be optimal. Thus, it is possible that simple and intuitive business practices are the best possible methods, and this is why they stay with us for decades. The tension between "suboptimal, but sticky" and "optimal" is similar to a tension that exists in the psychology literature around how heuristics—which are mental shortcuts used to solve complex problems—developed. While some scholars (e.g., Kahneman and Tversky, 1972) point out that heuristics lead people to make systematic mistakes, others (e.g., Gigerenzer and Goldstein, 1996; Gigerenzer and Todd, 1999; Todd and Gigerenzer, 2000, 2007) argue that heuristics work in general and that they evolved over time.[10]

More generally, a significant part of the body of literature in economics and financial economics contain models that explain how observed business practices that appear to be simplistic or suboptimal are actually optimal under a set of assumptions. These models include, for example, signaling models, bargaining, and frictions of different kinds. While these models typically can explain some features of the observed phenomena, they often fail

[10] An important difference between the thesis proposed here and the heuristics debate is that the latter focuses on fundamentals, like choosing the better of two alternatives or deciding when to stop to search for a better alternative. This mechanism, however, does not necessarily explain the origins of business practices in complex organizations such as budgeting and compensation. Furthermore, unlike heuristics used in daily life for small stakes and typically under a time constraint (e.g., anchoring on an irrelevant number when assessing the value of a bottle of wine), business practices deal with large dollar amounts and are performed in an environment that allows one to expend the time and resources needed to achieve a good solution. Finally, unlike simple heuristics, business practices involve additional factors that may determine survival, like ease of communication and imitation.

short of explaining all empirical observations. In addition, these models oftentimes made strong rationality and information availability assumptions that more often than not reflect the reality of corporate life.

Furthermore, the existing evidence in corporate finance show that many business practices are appear to be driven by psychological biases of managers or investors and therefore likely to be suboptimal (see survey by Baker and Wurgler, 2013). Interestingly, many of these practices have not been updated for decades despite the changing economic landscape. For instance, managers have long used rules of thumb when deciding on dividend distributions (Lintner, 1956) and it seems similar rules of thumb were still in use 50 years later (Brav, Graham, Harvey, and Michaely, 2005).

The question that needs to be asked is whether managers have behavioral biases, or whether they just follow business practices without questioning them. It is possible that these business practices started with a rule driven by a behavioral bias; then, once they were established standard business practice, they became subject to these same evolutionary dynamics. Other examples of corporate policies that managers pursue following heuristics include the popular "invest in what you know" (home bias) and "invest only funds that you have" (investment–cash flow sensitivity).

"Existing Business Practices Are Indeed Suboptimal."

Business Practices Could Be Driven by Behavioral Biases

Several studies argue that some business practices are suboptimal because they are driven by behavioral biases. For example, the disposition effect—the tendency of people to sell assets that are in profit and keep those that are in loss—is widely argued to be a source of a behavioral bias driven by loss realization aversion (Shefrin and Statman, 1985; Odean, 1998) or by overconfidence (Ben-David and Hirshleifer, 2012). Similarly, corporate decisions are influenced by miscalibration (Ben-David, Graham, and Harvey, 2013).If business practices are also driven by behavioral biases, then they are not optimal solutions.

This explanation suggests that simple methods pose low mental load and that they cater to some behavioral biases. While this is a good description of how new methods evolve, it does not explain what is required from a new method to become dominant in an industry. Behavioral biases do not explain what mechanisms help a particular business method survive over the long haul.

"More Business Education Needed."

Another potential explanation for why simple though suboptimal business practices endure could be a lack of communication between academia and business; if only academics tried harder, their improved methods would percolate into businesses. This explanation is not very plausible as millions of executives-to-be go through the higher education system hearing the mantras about the inefficiencies of the current methods used in industries.

Puzzles in Corporate Finance

If business practices are indeed the result of an evolutionary process, then this concept has several implications about the value of research and education in financial economics. By understanding the source of existing business practices, we may be able to better interpret patterns in financial data.

A cornerstone in modern corporate finance is the seminal work of Modigliani and Miller (1958), which work shaped the thinking of corporate finance academics. However, considerable evidence suggests that investors and managers did not buy into the argument that capital structure is irrelevant. For example, investors care about dividends a lot and see them as a stream of cash flows that is unrelated to stock prices (Hartzmark and Solomon, 2013, 2019). Managers are also concerned with maximizing earnings-per-share (maybe because of investor demand), e.g., in merger decisions (Garvey, Milbourn, and Xie, 2013; Dasgupta, Harford, and Ma, 2019). Another example is evidence that firms time the issuance of securi-

ties and often view debt as cheap and equity as expensive (Baker and Wurgler, 2002; Baker, Greenwood, and Wurgler, 2003; Baker, Hoeyer, and Wurgler, 2019).

The idea that existing business practices are sticky even if they are not optimal can explain a variety of puzzles in the corporate behavior of managers and investors. For example, heterogeneity in corporate leverage across industries is well documented (e.g., Scott and Martin, 1975; Bowen, Daley, and Huber, 1982). Manufacturing firms tend to have low leverage, while banking, real estate, leasing, and utilities tend to have high leverage. Several studies have proposed explanations for this data regularity (e.g., Boquist and Moore, 1984). Business practice can also help explain this heterogeneity. In particular, consider the business model that real estate and banks use. They are in the "spread" business; managers in these industries think about their businesses as borrowing at a certain cost (say 4%) and investing at a higher rate (say 6%). The difference (2%) is the profit from investment activity. Such a view of the business commends high leverage: The more you invest, the more you borrow. In other industries such as manufacturing, the business model is different. A manager in a manufacturing firm may operate according to the mantra of maximizing sales and minimizing expenses, where interest payments are one of the expenses. As such, this manager would strive to keep debt leverage low.

Another example is the well-documented investment–cash flow sensitivity (Fazzari, Hubbard, and Petersen, 1987). The academic prescription is to invest in positive NPV projects regardless of the available cash; firms are supposed to borrow or issue equity to fund positive NPV projects if they are short of cash. In contrast, studies find evidence that even non-financially-constrained firms are reluctant to raise external financing to fund positive-NPV investments (Kaplan and Zingales, 1997, among others). One potential explanation for this discrepancy between methods advocated by academics and those actually used in business is that transaction costs and other frictions prevent managers from making the optimal decisions (e.g., Lyandres, 2007). However, the behavior of matching outflows (i.e., investments) to inflows (i.e., cash flows) is broader than just in the corporate sector. For example, gov-

ernment agencies routinely engage in such matching as a standard policy (Hines and Thaler, 1995). In a similar fashion, universities use only the income earned on endowments and avoid touching gifts' principals (Shefrin and Thaler, 1988). Hence, it is possible that the investment–cash flow sensitivity phenomenon is driven, at least partly, by mental accounting (Thaler, 1999), i.e., the principle that "one invests within one's means," as households do when they match their consumption to their income (e.g., Baugh, Ben-David, Park, and Parker, 2020).

Old Business Practice, New Research Frontiers

Business education has traditionally been prescriptive, teaching students how businesses *should* behave as opposed to how they actually operate (a normative approach). In the search for new ways to improve business practices, academics often develop new methodologies and advocate their use in businesses. Despite a century of formal business education and decades of new techniques brought to the table by academics, business practices have not changed much.

Improving existing business practices is difficult for two reasons. First, some methods became business practices exactly because they were robust over time and provided a reasonable (but not necessarily optimal) solution to business problems over many years or decades and across different variations of the problem. Second, business practices are, by definition, used across the industry and therefore are likely to be used in contracts. As such, replacing existing business practices is likely to be quite costly.

Why are business practices so simple and intuitive? Their characteristics give them an advantage in becoming dominant in an industry: They are easy to deploy and likely to generate reasonable results in different environments. Furthermore, they create sticky industry lingo that facilitates communication within and outside the organization.

Many of the existing business practices are here to stay.

References

Agarwal, Sumit, and Itzhak Ben-David, 2018, Loan prospecting and the loss of soft information, *Journal of Financial Economics* 129, 608–628.

Aghion, Philippe, and Peter Howitt, 1992, A model of growth through creative destruction, *Econometrica* 60, 323–351.

Al-Najjar, Nabil I, and Mallesh M Pai, 2014, Coarse decision making and overfitting, *Journal of Economic Theory* 150, 467–486.

Baker, Malcolm, Robin Greenwood, and Jeffrey Wurgler, 2003, The maturity of debt issues and predictable variation in bond returns, *Journal of Financial Economics* 70, 261–291.

Baker, Malcolm, Mathias F Hoeyer, and Jeffrey Wurgler, 2019, Leverage and the beta anomaly, *Journal of Financial and Quantitative Analysis* 1–24.

Baker, Malcolm, and Jeffrey Wurgler, 2002, Market timing and capital structure, *Journal of Finance* 57, 1–32.

Baker, Malcolm, and Jeffrey Wurgler, 2013, Behavioral corporate finance: An updated survey, in *Handbook of the Economics of Finance*, volume 2, 357–424 (Elsevier).

Barber, Brad M, and Terrance Odean, 2007, All that glitters: The effect of attention and news on the buying behavior of individual and institutional investors, *Review of Financial Studies* 21, 785–818.

Baugh, Brian, Itzhak Ben-David, Hoonsuk Park, and Jonathan A Parker, 2020, Asymmetric consumption smoothing, *American Economic Review* forthcoming.

Baumol, William J, and Richard E Quandt, 1964, Rules of thumb and optimally imperfect decisions, *American Economic Review* 54, 23–46.

Begley, Jaclene, Lara Loewenstein, and Paul S Willen, 2019, The price-rent ratio during the boom and bust: Measurement and implications, Working paper, Federal Reserve Bank of Boston.

Ben-David, Itzhak, John R Graham, and Campbell R Harvey, 2013, Managerial miscalibration, *Quarterly Journal of Economics* 128, 1547–1584.

Ben-David, Itzhak, and David Hirshleifer, 2012, Are investors really reluctant to realize their losses? Trading responses to past returns and the disposition effect, *Review of Financial Studies* 25, 2485–2532.

Bénabou, Roland, and Jean Tirole, 2016, Bonus culture: Competitive pay, screening, and multitasking, *Journal of Political Economy* 124, 305–370.

Boquist, John A, and William T Moore, 1984, Inter-industry leverage differences and the DeAngelo-Masulis tax shield hypothesis, *Financial Management* 13, 5–9.

Bowen, Robert M, Lane A Daley, and Charles C Jr Huber, 1982, Evidence on the existence and determinants of inter-industry differences in leverage, *Financial Management* 11, 10–20.

Brav, Alon, John R Graham, Campbell R Harvey, and Roni Michaely, 2005, Payout policy in the 21st century, *Journal of Financial Economics* 77, 483–527.

Brennan, Thomas J, and Andrew W Lo, 2011, The origin of behavior, *Quarterly Journal of Finance* 1, 55–108.

Case, Karl E, Robert J Shiller, and Allan N Weiss, 1993, Index-based futures and options markets in real estate, *Journal of Portfolio Management* 19, 83–92.

Dasgupta, Sudipto, Jarrad Harford, and Fangyuan Ma, 2019, EPS-sensitivity and mergers, Working paper, University of Washington.

Davis, Gerald F, and Henrich R Greve, 1997, Corporate elite networks and governance changes in the 1980s, *American Journal of Sociology* 103, 1–37.

Demiroglu, Cem, and Christopher M James, 2010, The information content of bank loan covenants, *Review of Financial Studies* 23, 3700–3737.

Dichev, Ilia D, and Douglas J Skinner, 2002, Large-sample evidence on the debt covenant hypothesis, *Journal of Accounting Research* 40, 1091–1123.

Drexler, Alejandro, Greg Fischer, and Antoinette Schoar, 2014, Keeping it simple: Financial literacy and rules of thumb, *American Economic Journal: Applied Economics* 6, 1–31.

Drucker, Peter, 2012, *Managing in a time of great change* (Routledge).

Fabozzi, Frank J, Robert J Shiller, and Radu S Tunaru, 2020, A 30-year perspective on property derivatives: What can be done to tame property price risk?, *Journal of Economic Perspectives* 34, 121–45.

Farmer, J Doyne, and Andrew W Lo, 1999, Frontiers of finance: Evolution and efficient markets, *Proceedings of the National Academy of Sciences* 96, 9991–9992.

Fazzari, Steven, R Glenn Hubbard, and Bruce C Petersen, 1987, Financing constraints and corporate investment, Working paper, National Bureau of Economic Research.

Gabaix, Xavier, 2011, Game theory with sparsity-based bounded rationality, Working paper, New York University.

Garvey, Gerald T, Todd T Milbourn, and Kangzhen Xie, 2013, What will it do for my EPS? An unflattering but powerful motive for mergers, Working paper, Washington University in St. Louis.

Gersick, Connie JG, 1991, Revolutionary change theories: A multilevel exploration of the punctuated equilibrium paradigm, *Academy of Management Review* 16, 10–36.

Gigerenzer, Gerd, and Daniel G Goldstein, 1996, Reasoning the fast and frugal way: Models of bounded rationality, *Psychological Review* 103, 650.

Gigerenzer, Gerd, and Peter M Todd, 1999, *Simple heuristics that make us smart* (Evolution and Cognition).

Graham, John R, 1996, Debt and the marginal tax rate, *Journal of Financial Economics* 41, 41–73.

Graham, John R, and Campbell R Harvey, 2001, The theory and practice of corporate finance: Evidence from the field, *Journal of Financial Economics* 60, 187–243.

Guler, Isin, Mauro F Guillén, and John Muir Macpherson, 2002, Global competition, institutions, and the diffusion of organizational practices: The international spread of iso 9000 quality certificates, *Administrative Science Quarterly* 47, 207–232.

Hartzmark, Samuel M, and David H Solomon, 2013, The dividend month premium, *Journal of Financial Economics* 109, 640–660.

Hartzmark, Samuel M, and David H Solomon, 2019, The dividend disconnect, *Journal of Finance* 74, 2153–2199.

Hill, Robert J, and Iqbal A Syed, 2016, Hedonic price–rent ratios, user cost, and departures from equilibrium in the housing market, *Regional Science and Urban Economics* 56, 60–72.

Hines, James R, and Richard H Thaler, 1995, The flypaper effect, *Journal of Economic Perspectives* 9, 217–226.

Hinkelmann, Christoph, and Steve Swidler, 2008, Trading house price risk with existing futures contracts, *Journal of Real Estate Finance and Economics* 36, 37–52.

Hirshleifer, David, and Siew Hong Teoh, 2017, How psychological bias shapes accounting and financial regulation, *Behavioural Public Policy* 1, 87–105.

Holmstrom, Bengt, and Paul Milgrom, 1987, Aggregation and linearity in the provision of intertemporal incentives, *Econometrica* 303–328.

Hurvich, Clifford M, and Chih-Ling Tsai, 1989, Regression and time series model selection in small samples, *Biometrika* 76, 297–307.

Jiang, Wei, Ashlyn Aiko Nelson, and Edward Vytlacil, 2014, Liar's loan? Effects of origination channel and information falsification on mortgage delinquency, *Review of Economics and Statistics* 96, 1–18.

Jorion, Philippe, 1997, *Value at risk: The new benchmark for controlling market risk* (Irwin Professional Pub.).

Kahneman, Daniel, and Dan Lovallo, 1993, Timid choices and bold forecasts: A cognitive perspective on risk taking, *Management Science* 39, 17–31.

Kahneman, Daniel, and Amos Tversky, 1972, Subjective probability: A judgment of representativeness, in *The concept of probability in psychological experiments*, 25–48 (Springer).

Kaplan, Steven N, and Luigi Zingales, 1997, Do investment–cash flow sensitivities provide useful measures of financing constraints?, *Quarterly Journal of Economics* 112, 169–215.

Kroszner, Randall S, and Robert J Shiller, 2011, *Reforming US financial markets: Reflections before and beyond Dodd-Frank* (MIT Press).

Krüger, Philipp, Augustin Landier, and David Thesmar, 2015, The WACC fallacy: The real effects of using a unique discount rate, *Journal of Finance* 70, 1253–1285.

Langer, Ellen J, and Jane Roth, 1975, Heads I win, tails it's chance: The illusion of control as a function of the sequence of outcomes in a purely chance task, *Journal of Personality and Social Psychology* 32, 951–955.

Levitt, Steven D, and Chad Syverson, 2008, Market distortions when agents are better informed: The value of information in real estate transactions, *Review of Economics and Statistics* 90, 599–611.

Lintner, John, 1956, Distribution of incomes of corporations among dividends, retained earnings, and taxes, *American Economic Review* 46, 97–113.

Liu, Jing, Doron Nissim, and Jacob Thomas, 2002, Equity valuation using multiples, *Journal of Accounting Research* 40, 135–172.

Lo, Andrew W, 2017, *Adaptive markets: Financial evolution at the speed of thought* (Princeton University Press).

Lyandres, Evgeny, 2007, Costly external financing, investment timing, and investment–cash flow sensitivity, *Journal of Corporate Finance* 13, 959–980.

McDonald, Robert L, 2000, Real options and rules of thumb in capital budgeting, in Michael J Brennan, and Lenos Trigeorgis, eds., *Project Flexibility, Agency, and Competition: New Developments in the Theory and Application of Real Options*, 13–33 (New York: Oxford Univ. Press).

Modigliani, Franco, and Merton H Miller, 1958, The cost of capital, corporation finance and the theory of investment, *American Economic Review* 48, 261–297.

Nelson, Richard R, and Sidney G Winter, 2009, *An Evolutionary Theory of Economic Change* (Harvard University Press).

Odean, Terrance, 1998, Are investors reluctant to realize their losses?, *Journal of Finance* 53, 1775–1798.

Odean, Terrance, 1999, Do investors trade too much?, *American Economic Review* 89, 1279–1298.

Pinto, Jerald E, Thomas R Robinson, and John D Stowe, 2019, Equity valuation: A survey of professional practice, *Review of Financial Economics* 37, 219–233.

Posner, Eric A, and Luigi Zingales, 2009, A loan modification approach to the housing crisis, *American Law and Economics Review* 11, 575–607.

Rajan, Uday, Amit Seru, and Vikrant Vig, 2015, The failure of models that predict failure: Distance, incentives, and defaults, *Journal of Financial Economics* 115, 237–260.

Reppenhagen, David A, 2010, Contagion of accounting methods: Evidence from stock option expensing, *Review of Accounting Studies* 15, 629–657.

Romanelli, Elaine, and Michael L Tushman, 1994, Organizational transformation as punctuated equilibrium: An empirical test, *Academy of Management Journal* 37, 1141–1166.

Schiller, Christoph, 2017, Global supply-chain networks and corporate social responsibility, Working paper, University of Toronto.

Schumpeter, Joseph A, 2013, *Capitalism, socialism, and democracy* (Routledge).

Schwartzstein, Joshua, and Adi Sunderam, 2019, Using models to persuade, Working paper, Harvard University.

Scott, David F Jr, and John D Martin, 1975, Industry influence on financial structure, *Financial Management* 4, 67–73.

Scott, W Richard, 2013, *Institutions and organizations: Ideas, interests, and identities* (Sage Publications).

Shah, Rachna, and Peter T Ward, 2003, Lean manufacturing: Context, practice bundles, and performance, *Journal of Operations Management* 21, 129–149.

Shefrin, Hersh, and Meir Statman, 1985, The disposition to sell winners too early and ride losers too long: Theory and evidence, *Journal of Finance* 40, 777–790.

Shefrin, Hersh M, and Richard H Thaler, 1988, The behavioral life-cycle hypothesis, *Economic Inquiry* 26, 609–643.

Thaler, Richard H, 1999, Mental accounting matters, *Journal of Behavioral Decision Making* 12, 183–206.

Todd, Peter M, and Gerd Gigerenzer, 2000, Précis of simple heuristics that make us smart, *Behavioral and Brain Sciences* 23, 727–741.

Todd, Peter M, and Gerd Gigerenzer, 2007, Environments that make us smart: Ecological rationality, *Current Directions in Psychological Science* 16, 167–171.

Triana, Pablo, 2009, *Lecturing birds on flying: Can mathematical theories destroy the financial markets?* (John Wiley & Sons).

Trueman, Brett, MH Franco Wong, and Xiao-Jun Zhang, 2000, The eyeballs have it: Searching for the value in internet stocks, *Journal of Accounting Research* 137–162.

Van de Ven, Andrew H, and Marshall Scott Poole, 1995, Explaining development and change in organizations, *Academy of Management Review* 20, 510–540.

Vickrey, William, 1961, Counterspeculation, auctions, and competitive sealed tenders, *Journal of Finance* 16, 8–37.

Welch, Ivo, and Amit Goyal, 2007, A comprehensive look at the empirical performance of equity premium prediction, *Review of Financial Studies* 21, 1455–1508.

Werner, Geoff, and Claudine Modlin, 2010, Basic ratemaking, in *Casualty Actuarial Society*.