

The Journal of FINANCE

The Journal of THE AMERICAN FINANCE ASSOCIATION

The Journal of Finance®



John R. Graham

The President of the American Finance Association 2021

Presidential Address: Corporate Finance and Reality

JOHN R. GRAHAM*

ABSTRACT

This paper uses surveys to document CFO perspectives on corporate planning, investment, capital structure, payout, and shareholder versus stakeholder focus. Comparing policy decisions today to those 20 years ago, I find that companies employ decision rules that are conservative, sticky, and geared to time the market; rely on internal forecasts that are miscalibrated and considered reliable only two years ahead; and emphasize corporate objectives that focus increasingly on stakeholders and revenues. These practice of corporate finance themes can discipline academic models toward better explaining outcomes. Models of satisficing decision-making or costly managerial biases align with many of the themes.

IN A TRADITIONAL CORPORATE FINANCE framework, rational managers optimize to maximize shareholder value. A substantial body of research based on

*John R. Graham is with Duke University and NBER. I thank colleagues in Brazil, Canada, Ecuador, France, Japan, and The Netherlands for their joint efforts in conducting the global surveys. I thank many colleagues at Duke University, NBER, the Federal Reserve Banks of Atlanta and Richmond, and several universities for discussions about survey construction and the ideas in this paper. I thank Manuel Adelino, John Barry, Zahi Ben-David, Nick Bloom, Alon Brav, Murillo Campello, Harry DeAngelo, Dave Denis, Greg Dickinson, Jill Grennan, Michelle Hanlon, Cam Harvey, Mervyn King, Mark Leary, Yueran Ma, Stefan Nagel (Editor), Emi Nakamura, Kjell Nyborg, Shiva Rajgopal, Michael Roberts, David Robinson, Antoinette Schoar, Anil Shivdasani, Jeremy Stein, Johannes Stroebel, René Stulz, Neng Wang, Mike Weisbach, and Marc Zenner, as well as seminar participants at Aarhus, Duke, University of Illinois Chicago, University of Pittsburgh, Wake Forest, and the Joint Finance Seminar of the Universities of Bielefeld, Bonn, Dortmund, and Wuppertal and WHU Otto Beisheim School of Management for feedback on various stages of this research project. I thank Kevin Standridge, Chenyu Wang, Rong Wang, and Tuo Yang for excellent research assistance, and John Barry for outstanding research assistance and valuable feedback throughout. BRX Research Services provided high-quality survey implementation assistance. The ideas in this paper do not necessarily reflect the views of the aforementioned and any errors are my own. I have read the *Journal of Finance's* disclosure policy and have no conflicts of interest to disclose. I am not able to share the individual data but the coding underlying the figures and tables in this paper (which are based on aggregated data) can be found at https://github.com/jwb4335/corporate_finance_and_reality. Supplementary material and teaching slides can be found at <https://ssrn.com/abstract=3994851>. A video presentation can be found at <https://youtu.be/henjrUBi22g> and an Internet Appendix is available on the *Journal of Finance* website at <https://onlinelibrary.wiley.com/doi/10.1111/jofi.13161>.

Correspondence: John R. Graham, Duke University and NBER, 100 Fuqua Drive, Durham NC, 27708, USA; e-mail: john.graham@duke.edu.

This is an open access article under the terms of the [Creative Commons Attribution-NonCommercial](#) License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited and is not used for commercial purposes.

DOI: 10.1111/jofi.13161

© 2022 The Authors. *The Journal of Finance* published by Wiley Periodicals LLC on behalf of American Finance Association.

this framework assumes among other things that managers form rational expectations, optimize corporate investment intertemporally, and invest in positive net present value (NPV) projects. However, these principles only partially align with real-world decision-making. Moreover, a gap between academic research and the practice of finance is reflected in the modest statistical fit of most corporate finance models and the even more modest ability to predict outcomes out of sample or provide quantitative guidance for specific companies.¹

The research-practice gap may have several possible explanations. For example, the academic (rational) paradigm may be normatively correct but managers err by not listening to academics; academic assumptions and approaches may be reasonable but not sufficient to solve key puzzles; researchers may operate under the wrong set of assumptions about managerial preferences, objectives, and biases, and the academic research process may perpetuate these mistakes; and the world may be too complicated for practitioners to optimize or implement academic approaches. It is also possible that managers act “as if” they follow theory (Friedman (1953)).²

To address the research-practice gap, it is important to examine not only corporate outcomes but also firms’ underlying decision processes. In a corporate finance setting, we can directly obtain this information from surveys of the expert practitioners who make the decisions that influence actual outcomes. In this paper, I use CFO surveys to collect detailed information about the practice of finance that can be used to discipline and test academic models, with the goals of improving predictability and working toward closing the research-practice gap.

Specifically, based on CFO surveys conducted in 2019 and 2020, I explore these issues in two primary ways. The first is to comprehensively document key stylized facts characterizing real-world corporate decision-making, with a focus on the link between decision processes and corporate outcomes. The CFO surveys explore topics including corporate investment,³ capital structure, payout, and corporate expectations and planning. Some of this analysis is new to finance, such as that corresponding to the corporate planning process, even though planning is the foundation of many financial decisions and underlies the cash flow forecasts that are a staple of finance teaching and research. Other analyses in this paper update and build upon previous surveys of financial executives that I conducted with coauthors over the past 25 years (see the [Appendix](#) for a list of prior surveys).⁴ Comparing the new surveys to

¹ One example: In a capital structure context, Graham and Leary (2011) show that the standard explanatory variables explain about 10% of within-firm variation in leverage. Untabulated analysis for this paper shows that explanatory power is worse out-of-sample.

² Models’ generally poor statistical fit and out-of-sample performance in explaining outcomes imply that managerial actions are not consistent in an “as if” sense with model predictions, but rather suggest that either key elements are missing from current models or a lot happens in practice that is not predictable (high noise-to-signal ratio). See Section I for further discussion.

³ For a theory versus practice comparison of valuation techniques used by analysts, see Mukhlynina and Nyborg (2020).

⁴ These past surveys, most of which were conducted with Cam Harvey, present early evidence on some of the phenomena documented in this paper, such as the use of simple decision rules.

previous surveys allows me to identify what has (or has not) changed. Doing so leads to the second key feature of the paper: identifying common themes in corporate decision-making that hold across policies and through time. These stylized facts and common themes can help us better understand the underlying mechanisms of corporate finance, clarify whether and why models do not align with practice, and improve our ability to explain economic outcomes.⁵

Common Themes in the Practice of Corporate Finance

Analyzing decision-making both across policies and over time allows me to identify common themes in corporate decision-making. These themes represent a set of underlying principles that can be used to inform the development of future models and empirical analyses. In the remainder of the introduction, I describe these unifying themes, touching on policy-level survey results briefly in explaining the various themes. Detailed policy-level survey results follow in the subsequent sections.

One common practice of finance theme is that in many instances, companies *focus on the near term*. For instance, CFOs indicate that, on average, the information in their corporate plans is reliable for a horizon of only two years—and that this horizon has decreased over time. A short and decreasing reliability horizon makes planning difficult and affects corporate decisions, such as encouraging a focus on short-term investment projects.⁶ Other evidence of a near-term focus includes extensive use of the payback method for capital budgeting; emphasis on current profits when changing investment plans; and benchmarking debt against current cash flows rather than long-term value.

Under a traditional corporate finance framework, managers form rational expectations, with their expectations calibrated to the distribution of future realizations. In contrast, a second theme that emerges from the CFO surveys is that in reality, managerial forecasts produce an unusual number of positive and negative surprises, that is, *managerial forecasts are miscalibrated* (or overprecise), with the second moment of the distribution too tight.⁷ For example, managers' forecasts are miscalibrated if ex post 25% of firm

⁵ An old adage says to use the world as a textbook, not the textbook as the world. At a minimum, surveys allow professors to accurately describe to students what firms actually do, which is important if these students are to use the best of theory and practice to guide their future employers through the complex modern economy.

⁶ Companies do, of course, continue to make long-term investments, but such decisions are based on projections that have become increasingly less reliable as the horizon increases, which encourages shorter-horizon investing. Future research should investigate whether, in addition to decreasing the investment horizon, a shorter planning horizon encourages companies to invest less.

⁷ It is not surprising that managerial forecasts are miscalibrated given that other research documents miscalibration among everyday people (Alpert and Raiffa (1982)) and experts (Soll and Klayman (2004)) alike. Given my short time series, I cannot directly prove miscalibration (though the survey evidence is consistent with it). For additional evidence of managerial miscalibration, see Ben-David, Graham, and Harvey (2013) and Boutros et al. (2021), who show that CFOs from the Duke CFO survey are miscalibrated and that miscalibration persists over time. See also Barrero (2022).

realizations are below (above) the 10th (90th) percentile of their forecasted distributions, leading to frequent downside and upside surprises.⁸ Because prior evidence suggests that managers' job prospects and reputations are penalized proportionally more for downside misses than they are rewarded for upside misses, in this paper, I focus primarily on the effects of *downside surprises*.⁹

How might we expect corporate policies to be designed given that planning is reliable only a couple years out and firms do not anticipate tail risks well? Companies *adopt what appear to be conservative policies* (the third theme), perhaps in an effort to provide slack in the event downside surprises occur.¹⁰ Conservative policies are common. Capital budgeting policies are conservative in that companies set investment hurdle rates far above their cost of capital, which leads them to choose projects that *ex ante* they believe will have large NPV ($NPV > 0$). The idea is that if a negative surprise occurs, and *ex post* the company finds itself underperforming expectations, projects in place may still be positive NPV or close to it. Such conservatism might be advantageous if, for instance, investment is irreversible or transactions costs are high, or simply if firms prefer not to reverse affirmative decisions. In the context of capital structure decisions, CFOs indicate that their primary objective is to preserve financial flexibility (in part to avoid distress), which is also consistent with mitigating the cost of downside surprises.¹¹ The CFOs also indicate that dividend payout increases tend to be conservative, allowing a firm to maintain

⁸ The planning analysis below shows that in response to past forecast errors and economic shocks, managers appear to adjust the second and first moments of forecasts. However, Boutros et al. (2021) indicate that while second-moment adjustments are "in the right direction," they only partially attenuate miscalibration in future forecasts.

⁹ As David Viniar, then-CFO of Goldman Sachs, noted in mid-August 2007, "The lesson you always learn is that your definition of extreme is not extreme enough" (see <https://www.nytimes.com/2007/08/13/business/13cnd-goldman.html>). In terms of being penalized for downside outcomes, Jenter and Kanaan (2015) document that some CEOs are fired for downside misses beyond their control such as industry or market shocks. Gennaioli, Ma, and Shleifer (2016) and Barrero (2022) show that CFO forecasts appear to be unbiased, implying that upside surprises are also common. Future research should explore the implications of not sufficiently anticipating upside outcomes.

¹⁰ A working hypothesis is that executives (companies) are aware that their forecasts are miscalibrated, or that they have been surprised by past downside outcomes and the associated penalties, and as a result, they design policies that build in slack. An important but unresolved question that I discuss below is why do executives not fix the miscalibration instead. It may be the case that they cannot fix it thus they try to prepare for it. This is somewhat like the sophisticated agents in the O'Donoghue and Rabin (1999) self-control model, who implement more-than-offsetting strategies in the near term because they believe that they may behave suboptimally in the future. In this paper, I consider miscalibration in the context of core financial policies. Future research should investigate whether miscalibration and adaptations to it affect management practices more broadly, including corporate culture.

¹¹ See Graham (2000) for additional evidence of conservative capital structure decisions. Using the same survey data used in this paper, Barry et al. (2022) show that financial flexibility, workplace flexibility, and investment flexibility helped firms navigate the COVID crisis and affected plans for post-COVID operations.

its dividend even if future profits disappoint.¹² In sum, decision rules are often conservative, to some extent offsetting near-focused and miscalibrated managerial forecasts.

Fourth, companies are assumed to intertemporally balance marginal costs and benefits, implying changes in corporate decision-making as market conditions change. One might therefore expect the preferred corporate policies to change with structural changes in the U.S. economy (e.g., shift to a service-based economy, growth in intangible assets, and historically low interest rates).¹³ The CFO surveys, however, indicate that *corporate decision-making is sticky*. For example, the factors that drive debt decisions are ranked similarly in 2022 and 2001. In addition, the popularity of using the capital asset pricing model (CAPM) to estimate the cost of capital has persisted over the past 20 years, despite many advances in asset pricing theory and evidence that the CAPM does not well explain the cross-section of returns. Moreover, investment hurdle rates are very sticky, with only minor changes over the past 35 years even as market interest rates fell substantially. CFOs further indicate that target debt ratios do not change often. This wide-spread inertia implies that even when decisions are made according to economic principles, changes to the decision process move slowly, with possibly long lags before changes appear in the data; and when changes do occur, they may reflect a “pent up” need to change. Such inertia may be due to coordination and communication frictions in organizations or to rigidity of the budgeting process. Note that policy stickiness might be connected to the previous theme of conservative policies that build in slack, as conservative policies may allow firms to adapt to changing conditions slowly.¹⁴

A fifth theme relates to the commonly held assumption that managers use decision processes that account for multiple dimensions of complex circumstances. The CFO surveys suggest that *companies use simple decision rules* (see also Graham and Harvey (2001)). For example, even after decades of business education highlighting the deficiencies of the payback rule, many (especially small) firms rely more heavily on payback than on NPV in capital allocation, possibly due to implementation challenges. Moreover, NPV often plays a supporting role in corporate investment choices.¹⁵

Corporate research also often assumes that financial markets are (close to) informationally efficient, which implies that there is little advantage to

¹² These last two findings confirm evidence in Graham and Harvey (2001), Brav et al. (2005), and archival research, consistent with inertia in corporate decision-making (which is the next theme).

¹³ In 2000, GE had the largest market value, followed by Exxon, Pfizer, Cisco, and Citigroup. In 2020, the six largest companies by market value were Apple, Microsoft, Amazon, Google, Facebook, and Tesla. Among the 20 largest firms in 2000, only three (Walmart, Microsoft, and Johnson & Johnson) were also among the largest 20 in 2020.

¹⁴ Despite substantial inertia, examples of changes that have occurred over the past two decades include increased emphasis on flexibility, a shift toward stakeholders, and a shorter term planning focus (likely due to increased uncertainty).

¹⁵ Formal textbook rules also sometimes take a back seat to informal or “strategic” considerations. NPV (or IRR) in many cases is used to justify a decision made by other means.

trying to time the market and that market prices are a reliable guide for financial decisions. In reality, the CFO surveys show that often *managers attempt to time the market* when issuing securities or repurchasing shares, consistent with Graham and Harvey (2001) and archival findings (e.g., Baker and Wurgler (2002), Shleifer and Vishny (2003)). This finding suggests that managers believe that they have an informational advantage or that managers believe that markets are not fully efficient. Using survey data back to the 1990s, I find that most managers believe that their firm's stock is undervalued, which could encourage attempts to time the market. While other explanations likely exist, the left-tail miscalibration discussed above can lead a manager to believe that the market undervalues their company's stock.

Finally, the surveys provide evidence about *the objects over which companies attempt to optimize*. Somewhat at odds with the traditional objective of maximizing shareholder value, the survey evidence suggests that *companies have shifted toward a more balanced shareholder-stakeholder focus*. As discussed below, this potentially has implications for discount rates and employee welfare. In addition, corporate objectives appear to focus more on the valuation numerator (revenues or cash flows) than on the denominator (discount rates), more on debt/EBITDA or credit ratings than on debt/value or debt/assets,¹⁶ and more on maintaining dividend payouts than on the classic objective of first choosing investment projects and then paying out excess profits to investors.

Implications and Roadmap

To summarize, the survey evidence indicates that the decision-making that drives corporate outcomes is based on a short and decreasing reliability horizon, miscalibrated forecasts, decision processes that are simple, sticky, and conservative, and managers who have rosy views of their firms' valuations. Models and empirical analyses should account for these common themes of real-world corporate finance. Research that incorporates costly managerial biases can investigate these themes in fairly traditional ways.¹⁷ For example, Barrero (2022) adds two biases (miscalibration and extrapolation) to an otherwise traditional structural model to study hiring and valuation.

Less traditional approaches such as a satisficing framework (Simon (1956a)) can also help explain several of the common themes of corporate finance.¹⁸ The world is very complex. Managers cannot reliably plan far into the future and have an imperfect understanding of tail outcomes. Because managers

¹⁶ Given that cash flows are relatively volatile in some industries, a debt/EBITDA focus may help explain why real-world debt targets are often loose and companies behave as if objective functions are flat (see figure 10 in Binsbergen, Graham and Yang (2010)).

¹⁷ Ben-David, Graham, and Harvey (2013) show that managers' subjective distributions of corporate investment IRRs are miscalibrated and the authors link miscalibration to investment and capital structure policies. See also Graham, Harvey, and Puri (2013), Malmendier and Tate (2015), Gennaioli, Ma, and Shleifer (2016), Manski (2018), Shleifer (2019), Barrero (2022), and cites therein.

¹⁸ Simon (1956b) argues that rational models can find optimal solutions for a simplified world or satisficing models of simple behavior can explore decisions in a more realistic world.

cannot optimize in a precise sense (except perhaps at great cost), they instead make satisficing choices. Perhaps the best firms can do take steps in what they believe is the right direction (Kay and King (2020)), to achieve incremental improvement and keep alive future options. Conservative and simple rules may work as well as any in this environment (Gigerenzer (1991)), and if a given decision rule works well enough, executives are likely to stick with it. Importantly, under the satisficing framework, not optimizing in a traditional economic sense is not necessarily evidence of a bias that leads to inferior performance, but rather may simply reflect learned adaptations to real-world circumstances. One could interpret many corporate actions and outcomes through this lens.

Various implications follow from the common themes summarized above. First, taken together, the themes of corporate finance suggest that assuming representative or homogeneous economic players masks the fact that heterogeneous firms may respond differently to a common shock, and use different decision processes, due to differences in their circumstances and historic paths. Moreover, the themes suggest new dimensions to consider when evaluating academic models, for example, whether a model designed to capture one or two themes (e.g., miscalibration, focus on near term) produces results consistent with the other themes (e.g., simple and sticky decision rules). I explore these and other implications in Section VII below. My hope is that theoretical and empirical research that takes seriously the unifying themes and real-world objectives of corporate finance can help better explain and predict outcomes. In addition to in-sample fit, progress should be measured against out-of-sample performance, with quantitative guidance at the firm level a bonus.

The implications of this paper extend beyond corporate finance. Companies drive much of the employment and investment in the economy, and the aggregation of firm-level decisions defines much of the macroeconomy. Companies also produce the assets and cash flows that underlie the securities on which asset pricing is based.¹⁹ The implications also suggest that policies and legal systems should take the real-world practice of finance into account. For example, as discussed below, the fact that companies' investment decisions rely on sticky hurdle rates suggests that investment may be insensitive to interest rates, in which case interest rate-based monetary policy will struggle to spur corporate investment. In general, better understanding real-world corporate finance is central to understanding the macroeconomy, asset pricing, and policy and legal objectives.

The paper proceeds as follows. Section I describes the surveys and data collection. Section II explores corporate investment and capital budgeting. Section III focuses on planning and internal forecasts, Section IV on capital

¹⁹ The evidence presented herein suggests that variation in discount rates is not a first-order driver of corporate investment. Interestingly, investor discount rates have traditionally been viewed as important in asset pricing (Campbell and Shiller (1988), Cochrane (2008, 2011)). Recently, Bordalo et al. (2020a), De La O and Myers (2021), and Pettenuzzo, Sabbatucci, and Timmermann (2020) suggest a more prominent role for cash flows.

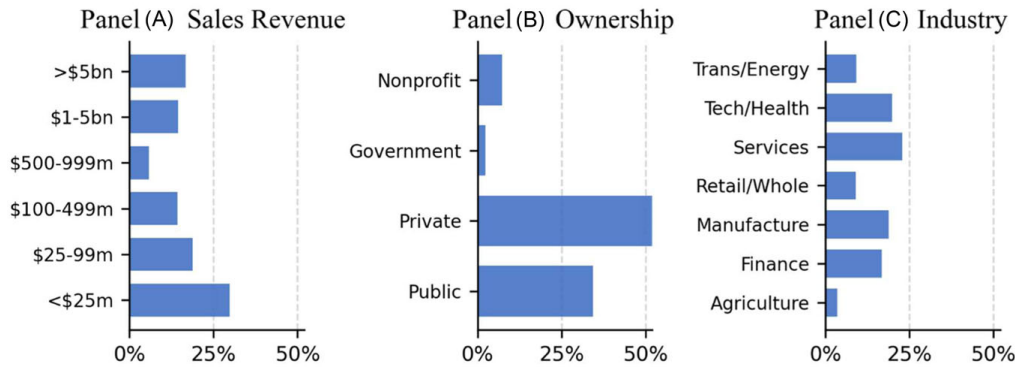


Figure 1. Demographics for survey companies. This figure displays demographic variables for firms in the 2022 CFO survey (combining the March 2019 and March 2020 waves of the survey). Internet Appendix Figure IA.1 displays more detailed demographic breakdowns. (Color figure can be viewed at [wileyonlinelibrary.com](https://onlinelibrary.wiley.com))

structure, target debt ratios, frictions that drive leverage decisions, and the importance of financial flexibility, Section V on payout policy, including the tension between payout and investment, and Section VI on shareholder versus stakeholder welfare. Sections II to VI provide in-depth treatment of a given topic, emphasizing new information while also presenting new analysis of known facts. Section VII discusses avenues for future research and Section VIII concludes. The Appendix and an Internet Appendix²⁰ provide more details.

I. Data and Survey Methodology

Much empirical corporate finance research attempts to infer decision-making and optimization by studying archival data. However, such data can reflect government policy responses to economic events and corporate adjustments to those policy changes, making it difficult to isolate ex ante corporate plans, explore the reasonableness of underlying economic assumptions, or fully assess model performance. Surveys complement archival data and extend our knowledge of corporate behavior by directly asking questions of the expert practitioners responsible for firms' ex ante plans, policies, outcomes, and underlying decision processes.

The main data source for this paper is a multipart survey conducted primarily in March 2019 and March 2020. To align with the publication date of this paper, I refer to these two surveys jointly as reflecting the practice of finance in 2022. Figure 1 summarizes respondents by several demographics; details on the content and timing of the surveys and on the survey methodology are provided in Sections I and II of the Internet Appendix. Although the surveys were conducted worldwide, in this paper, I focus mostly on the U.S. data (which

²⁰ Internet Appendix is available in the online version of the article on *The Journal of Finance* website at <https://onlinelibrary.wiley.com/doi/10.1111/jofi.13161>.

include several dozen Canadian responses). I rely on other data sources, including surveys conducted from 1996 to 2020 as part of Duke's Global Business Outlook (cfosurvey.fuqua.duke.edu) and other research (e.g., Ben-David, Graham, and Harvey (2013), Gennaioli, Ma, and Shleifer (2016), Barrero (2022), Boutros et al. (2021)) to shed light on specific features of corporate forecasts and decision-making.

In addition to exploring traditional subjects such as investment, financing, and payout policies, the surveys investigate corporate expectations and planning. In March 2019, each firm was asked to provide year-2019 internal forecasts and ex ante plans for a number of variables, including sales, capital expenditures, research and development (R&D), employment, sources of external funds, cost of capital, and payout. The CFOs provided base-case, upside, and downside forecasts for several variables, and best-guess as well as 10th and 90th percentile revenue forecasts.²¹ In March 2020, many of these same CFOs then provided realizations for 2019, and in the case of any forecast errors, statements explaining what caused the deviations and how the surprises affected decision-making. The March 2020 wave also requested year-2020 forecasts for several key variables, again including the 10th and 90th percentiles for revenues. These data allow me to observe how firms react to shocks to the planning process. In particular, I explore the effects of both 2019 forecast errors and the 2020 COVID shock on policy decisions and on first- and second-moment forecasts for 2020 (see Section III). Importantly, much of my data were gathered before the COVID crisis, and thus, the crisis plays a minor role in my analysis except where noted otherwise.

Analyzing survey data is not without potential problems (see Internet Appendix II for further discussion). Perhaps managers do not understand the questions as asked. Alternatively, perhaps practitioners do not have to understand why they do what they do for economic models to be predictively successful (Friedman's (1953) "as if" thesis). I argue in the introduction that the modest statistical fit and even more modest ability of models to predict out-of-sample outcomes weakens the as-if argument. Moreover, to narrow the gap between the theory and practice of corporate finance, it is important to address both cause and effect, which the as-if perspective sidesteps. Considering how experts make decisions might be helpful for several reasons. First, following Friedman (1953), the common themes and other results that I document may provide for a wider range of assumptions within traditional models, some of which might lead to improved predictability. Second, for those who favor the subset of realistic assumptions, knowing which assumptions and processes

²¹ Altig et al. (2020), based on several hundred monthly responses from financial executives, and Bloom et al. (2020), based on a Census question answered by managers at more than 30,000 plants, find that the 10th (90th) percentile forecast aligns with the "lowest" ("highest") forecast when respondents probability-weight five possible future outcomes: lowest, low, middle, high, and highest. That is, these respondents assign a 10% probability of the "lowest" and "highest" forecasts occurring. Bachmann et al. (2020) show that the span between "best possible" and "worst possible" forecast is wider following large changes in past sales growth and large recent forecast errors, particularly following negative occurrences.

influence managerial decisions has the potential to lead to a broader set of models. Third, if models incorporating improved assumptions still have weak explanatory power, then understanding real-world decision processes is an end unto itself, providing a lens through which to interpret economic data. Finally, the common decision-making themes and stylized facts may be of independent research interest (e.g., exploring the underlying forces that lead to the common elements of firms' decision processes).

II. Corporate Investment, Capital Budgeting, and the Cost of Capital

Most corporate investment research is based on outcomes as reflected in financial statement data. To help improve our ability to explain outcomes, in this section, I focus on *how* investment decisions are made. Common themes across decision processes related to investment are emphasized (e.g., decision rules are generally simple and exhibit inertia and conservatism). The evidence suggests that shocks to demand and cash flows have first-order effects on investment while interest rates do not. Section II.A explores the capital budgeting decision rules companies use, many of which involve both discount rates and cash flow forecasts. Section II.B (II.C) studies discount rates (state variables that drive investment). Section III examines revenue and cash-flow-related issues.

A. Capital Budgeting Decision Rules

Standard finance logic argues that, absent constraints and given perfect markets, companies should pursue $NPV > 0$ projects to increase firm value. Standard textbook guidance further argues that in an unconstrained rational setting, the investment hurdle rate should be set equal to the cost of capital and projects with an expected internal rate of return (IRR) that exceeds the hurdle rate should be pursued. The CFO surveys explore the extent to which these and other decision rules are used in capital budgeting.

Figure 2 and Table I document that NPV and IRR are the most popular decision rules among large U.S. firms. In 2022, at least three-quarters of large firms indicate that they always or almost always use NPV and IRR in capital budgeting, which is only somewhat fewer than 20 years earlier (Graham and Harvey (2001)). Though not shown in the table, significantly more shareholder-focused firms²² and significantly fewer family firms rely on NPV, and likewise so do significantly more firms with CEOs whose pay is tied to stock performance (above the median in performance pay). These findings are intuitive given that maximizing NPV is consistent with creating wealth for equityholders. In addition to NPV and IRR, many firms rely on simple investment decision rules like payback and return on invested capital (ROIC),

²² On a scale of 0 to 100, where 0 (100) indicates that a company should be run for the benefit of shareholders only (stakeholders other than shareholders only), by shareholder-focused firms I refer to companies whose CFOs give a value of ≤ 40 (see Figure 22).

Table I
Capital Budgeting Techniques

This table presents survey responses to the following question about capital budgeting methods: *How frequently does your firm use the following techniques when deciding which projects or acquisitions to pursue?* {0 = Never; 1, 2, 3, 4 = Always}. Panel A compares results from the Graham and Harvey (2001) survey to results from the 2022 Duke CFO Survey (March 2020 wave). Columns (1) and (2) display the percentage of large firms that always or almost always use the given technique (i.e., they answered a score of “3” or “4” to the question above). Columns (3) and (4) display the same for small firms. Large (small) firms have revenue greater (less) than \$1 billion. No statistical tests are performed in columns (1) to (4). Columns (5) and (6) display the average score (on a 0 to 4 scale) for each technique in the 2001 and 2022 surveys, respectively. Columns (7) to (10) display analogous information for large and small firms. For each pair of columns and each technique, a comparison of means (*t*-test) is performed (e.g., in columns (5) and (6), the mean scores for each technique are compared across the full samples in the 2001 and 2022 surveys). Panel B uses data solely from the 2022 Duke CFO Survey and displays comparisons of the frequency of use of each technique across different company characteristics (e.g., small and large firms are compared in columns (1) and (2)). Definitions of demographic variables are given in Appendix Table A.I. *, **, and *** display significance at 10%, 5%, and 1% level, respectively.

Panel A: Capital Budgeting Techniques, 2001 vs. 2022 Comparison											
	Percent Always or Almost Always						Score				
	Large Firms		Small Firms		Full Sample		Large Firms		Small Firms		
	2001 (1)	2022 (2)	2001 (3)	2022 (4)	2001 (5)	2022 (6)	2001 (7)	2022 (8)	2001 (9)	2022 (10)	
N	161	85	217	376	378	461	161	85	217	376	
Net Present Value	84.52	77.38	67.92	40.22	3.08	2.04***	3.42	3.10**	2.83	1.80***	
IRR/Hurdle Rate	84.81	75.00	68.72	39.67	3.09	2.10***	3.41	3.02**	2.86	1.89***	
Scenario Analysis	58.67	68.67	46.38	51.78	2.31	2.38	2.56	2.81	2.13	2.28	
Payback	45.89	63.86	64.29	66.40	2.53	2.80***	2.25	2.82***	2.72	2.80	
ROIC ('22) Book Return ('01)	18.18	56.79	21.78	43.99	1.34	2.15***	1.25	2.60***	1.41	2.05***	
P/E Multiples	40.97	48.78	37.50	41.24	1.89	1.92	2.01	2.33	1.80	1.82	
Profitability Index	8.03	38.75	14.50	30.56	0.83	1.59***	0.75	1.81***	0.88	1.54***	
Real Options	28.03	37.50	25.63	40.28	1.47	1.90***	1.57	1.94*	1.40	1.90***	
Simulation Analysis/VAR	16.08	35.80	11.94	17.65	0.95	1.19***	1.22	1.79***	0.76	1.06***	
Adjusted Present Value	7.30	18.75	13.20	14.85	0.85	0.99	0.72	1.11**	0.93	0.96	

(Continued)

Table I—Continued

Panel B: Capital Budgeting Techniques, Conditional on Company Characteristics													
	Size		Public		Growth Prospects		Pay Dividends		Leverage		Cash		Financial Flexibility
	Small (1)	Large (2)	No (3)	Yes (4)	No (5)	Yes (6)	No (7)	Yes (8)	Low (9)	High (10)	Low (11)	High (12)	
<i>N</i>	376	85	373	88	201	215	183	57	92	70	195	188	95 366
Net Present Value	1.80	3.10***	1.78	3.17***	1.81	2.13**	2.04	2.43	1.60	2.10**	2.13	1.84*	1.87 2.09
IRR/Hurdle Rate	1.89	3.02***	1.86	3.10***	1.90	2.20**	1.96	2.60***	1.73	2.44***	2.11	2.01	1.68 2.21***
Scenario Analysis	2.28	2.81***	2.25	2.92***	2.15	2.51**	2.44	2.77	1.94	2.31*	2.22	2.48*	2.00 2.48***
Payback	2.80	2.82	2.75	3.03**	2.80	2.80	2.92	3.07	2.55	2.75	2.76	2.90	2.80 2.81
Return on Invested Capital	2.05	2.60***	2.02	2.73***	1.99	2.23*	2.00	2.36*	1.88	2.58***	2.18	2.06	1.87 2.23**
P/E Multiples	1.82	2.33***	1.74	2.67***	1.59	2.12***	1.91	2.52***	1.43	1.82	1.86	1.92	1.44 2.04***
Profitability Index	1.54	1.81	1.50	1.99***	1.48	1.59	1.69	1.59	1.26	1.63	1.67	1.43	1.37 1.65
Real Options	1.90	1.94	1.91	1.89	1.89	1.86	2.01	2.14	1.61	1.85	1.84	1.90	1.95 1.89
Simulation Analysis/VAR	1.06	1.79***	1.12	1.53***	1.06	1.20	1.20	1.70**	0.82	1.24**	1.11	1.21	0.89 1.27**
Adjusted Present Value	0.96	1.11	0.96	1.12	0.82	1.07**	1.05	1.25	0.84	0.85	0.87	1.08	0.69 1.07**

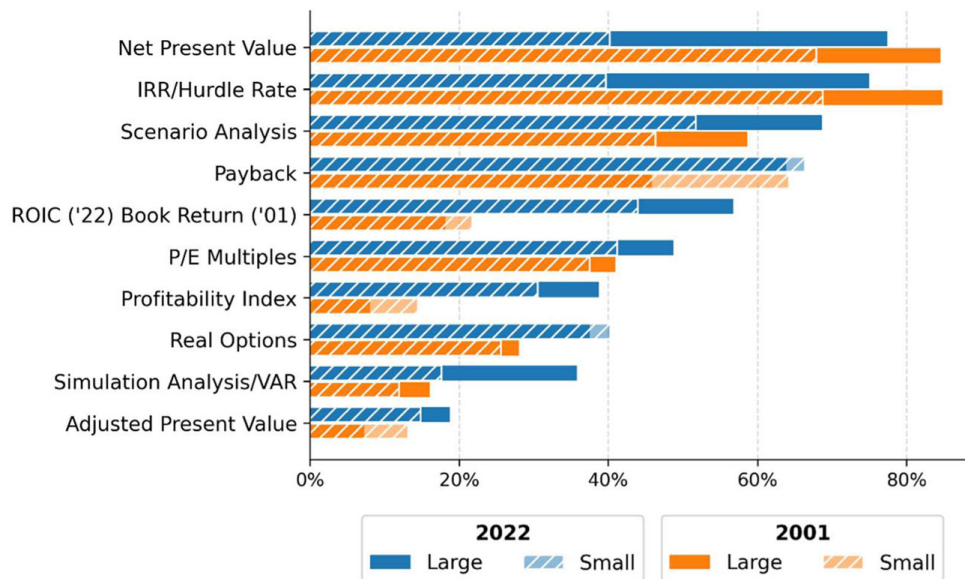


Figure 2. Capital budgeting decision rules. This figure displays CFO responses to the following question: *How frequently does your firm use the following techniques when deciding which projects or acquisitions to pursue?* {0 = Never, 1, 2, 3, 4 = Always}. The percentage of firms that answer “3” or “4” is shown for each decision rule. Blue (top) bars display results for the 2022 Duke CFO survey (March 2020 wave); orange (bottom) bars display results from Graham and Harvey (2001). Within each bar, the solid portion displays responses for large firms (revenue above \$1 billion) and the crosshatched portion displays responses for small firms (revenue below \$1 billion). In 2022, for example, according to the 2022 Duke CFO survey, 77% of large firms (40% of small firms) say that they always or almost always use NPV when choosing projects or making acquisition decisions, while the corresponding numbers for, say, payback are 64% and 66%. (Color figure can be viewed at wileyonlinelibrary.com)

which as commonly applied do not directly account for risk or the time value of money. Among small firms (revenues < \$1B), payback is far more prevalent than NPV or IRR, which written comments indicate reflects constraints on funding, time, or financial sophistication.

Comparing preferred capital budgeting decision rules over the past two decades provides evidence of several of the unifying themes described in the introduction: stickiness in the rankings assigned to various decision rules over time,²³ and the popularity of simple, short-horizon rules such as payback and ROIC. Open-ended survey responses presented in Section III of the [Internet](#)

²³ Confirming that not much has changed is important. Empirical studies that use several decades or more of data often implicitly assume that the processes explaining corporate behavior have not changed over the sample period, to justify using one specification to study all of the data, even as the nature of assets and products produced by the companies have changed substantially over the same period. My evidence pertains, of course, to the stability of decision processes, not necessarily stationarity of data distributions, although the two could be related. Relatedly, while one should be cautious in comparing very different samples, there is evidence of changes in the popularity of NPV in the decades preceding 2000. In a sample of approximately 100 large firms, Gitman and Forrester (1977) find that in the mid-1970s, only 10% (26%) of firms used NPV as their primary (secondary) decision rule, in comparison to 54% (14%) for IRR, 25% (14%) for accounting rate of return, and 9% (44%) for payback.

[Appendix](#) indicate that some firms do not rely on NPV as much as textbooks recommend due to liquidity needs, a lack of sophistication, and a preference for simple decision rules. These responses also indicate that NPV is often used to support decisions that are driven by other strategic or qualitative objectives.²⁴ These results raise several questions that future research should explore. For instance, do decision-makers shy away from conducting detailed cash flow and discount rate calculations, and if so why? Does business education sufficiently teach how to conduct capital budgeting in the face of uncertainty, a short planning horizon, or binding constraints?²⁵ And, given the use of simulations and real options has increased, do these trends reflect a changing nature of firms and their cash flows?

B. Discount Rates and Hurdle Rates

The popularity of IRR indicates that many businesses compare expected investment returns to a hurdle rate. Survey analysis shows that these hurdle rates differ from standard cost of capital estimates. First, as [Figure 3](#) shows, for at least two decades, hurdle rates have built in a “buffer” of 6% on average above the cost of capital (see also Jagannathan et al. ([2016](#))). This buffer is apparent in all industries (not shown) and among all firm types (see [Table II](#)). The effective buffer may be even higher: a June 2017 Duke CFO survey shows that only 20% of companies say that they accept all projects whose expected return exceeds the stated hurdle rate. Standard textbook logic holds that setting a hurdle rate higher than the cost of capital may lead firms to pass up value-creating projects. However, some firms indicate that setting a high hurdle rate helps them focus on the best projects.

Adding a buffer is conservative in that it leads firms to choose projects that they believe to be $NPV > 0$. The conservatism inherent in a high hurdle rate may reflect practical considerations if firms frequently underestimate the severity or likelihood of left-tail outcomes (miscalibration), combined perhaps with agency considerations making negative surprises onerous (see discussion in the introduction and [Section III](#)).²⁶ A high hurdle rate buffer is also

²⁴ Graham, Harvey, and Puri ([2015](#)) show that 70% of U.S. firms report that internal capital allocation is affected by the reputation of the manager requesting funding and nearly half indicate that managerial “gut feel” drives investment decisions.

²⁵ Mukhlynina and Nyborg ([2020](#)) use surveys to document the valuation methodologies used by practitioners (professional analysts in their case). They find that 84% of professional analysts always or almost always use multiples valuation techniques, with discounted cash flow (DCF) (i.e., NPV) being second-most popular. Parallel to what I document for CFOs, they find that analysts employ several simplifications, for example, they use the CAPM rather than a multifactor model to estimate the cost of equity, and they do not properly account for tax benefits when calculating the weighted average cost of capital (WACC). Mukhlynina and Nyborg ([2020](#)) argue that the gap between theory and practice in valuation is fairly wide and that peers have greater influence than financial education on the approach a given analyst uses in performing valuations. They argue that financial education within the workplace might help close the theory versus practice gap.

²⁶ Decaire ([2021](#)) uses oil drilling data to argue that the hurdle buffer is tied to idiosyncratic risk.

Table II
Hurdle Rates and the Cost of Capital

This table presents survey responses to the following question: *What is the hurdle rate (weighted average cost of capital, or WACC) that your company uses to evaluate investment projects? (The “hurdle rate” is typically the minimum rate of return a project is required to earn in order for a company to pursue the project.)* The table uses data solely from the 2022 Duke CFO Survey (March 2019 wave) and compares results across different company characteristics (e.g., small and large firms are compared in columns (2) and (3)). For each pair of columns and each pair of numbers, a comparison of means (*t*-test) is performed. Definitions of demographic variables are given in Appendix Table A.I. *, **, and *** display significance at 10%, 5%, and 1% level, respectively.

	All Firms (1)	Size		Public		Growth Prospects		Pay Dividends		Leverage		Cash		Financial Flexibility	
		Small (2)	Large (3)	No (4)	Yes (5)	No (6)	Yes (7)	No (8)	Yes (9)	Low (10)	High (11)	Low (12)	High (13)	No (14)	Yes (15)
<i>N</i>	220	138	82	131	89	101	112	132	88	111	101	112	79	22	198
Hurdle Rate	15.02	16.15	13.11**	16.03	13.52**	13.37	16.62**	15.44	14.39	14.79	15.65	16.07	14.72	15.18	15.00
WACC	9.04	9.10	8.95	8.95	9.17	8.05	9.86***	9.00	9.11	8.79	9.28	8.94	9.17	9.48	8.99
Buffer (Hurdle Rate—WACC)	5.98	7.06	4.16**	7.08	4.35**	5.32	6.76	6.44	5.28	6.00	6.37	7.13	5.55	5.70	6.01

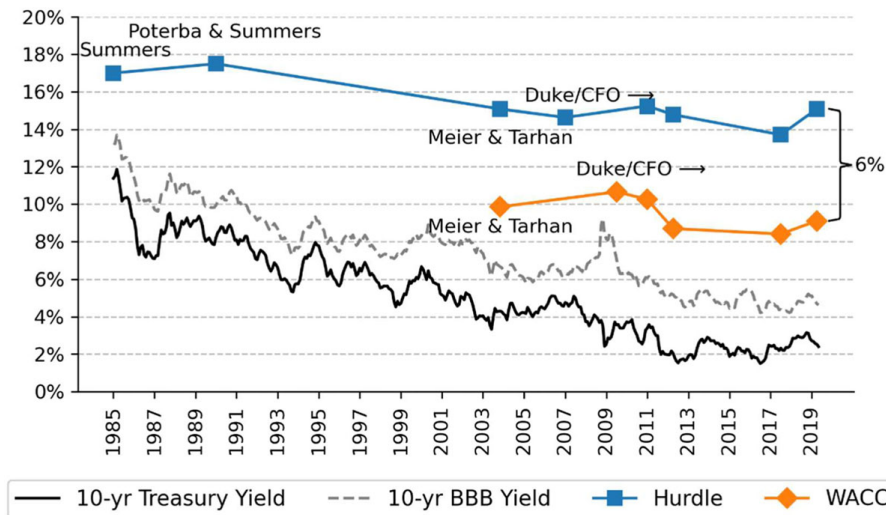


Figure 3. Hurdle rates and the cost of capital. This figure displays hurdle rates and the WACC over time based on different surveys. Each blue square in the top line corresponds to the average hurdle rate given by firms from the indicated survey. Each orange diamond in the second line from the top corresponds to the average WACC given by firms from the indicated survey. For example, the blue square and orange diamond on the far right display the hurdle rate and WACC (15% and 9%, respectively) for firms from the 2022 survey (March 2019 wave). This figure expands on figure 1 in Sharpe and Suarez (2021). Original data come from Summers (1987 Fortune 200 firms), Poterba and Summers (1995; Fortune 1000), Meier and Tarhan (2003; Northwestern University alumni who are CFOs), and various Duke CFO surveys from 2007 to 2019; interest rates come from FRED. (Color figure can be viewed at [wileyonlinelibrary.com](https://onlinelibrary.wiley.com))

consistent with high perceived costs of reversing an investment decision, and with it being hard to identify positive NPV projects or projects that pay back quickly: even if a project ex post underperforms to some degree, having used a buffer makes it less likely the project's performance will fall below the threshold that would involve changing from a yes to a no decision, which managers might prefer to avoid.²⁷ A subtle point is that, though not likely management's intent, choosing only projects that are expected to earn more than a "buffered up" hurdle rate may tilt a company's portfolio toward higher risk projects to the extent that risk and return are positively correlated.

²⁷ Duke CFO survey explanations for adding a hurdle rate buffer above the cost of capital include rationing due to financial constraints, operational constraints including on management's time (see also Jagannathan et al. (2016)), the desire to pursue the best project among available options, accounting for a margin of error in analysis, addressing dimensions (e.g., risk) not fully captured in IRR calculations, and choosing projects with a shorter payback period. Although not expressed this way by CFOs, when a company says that it does not pursue a project due to constraints (e.g., time or funding), this may indicate that if the project were pursued, it would be at higher cost and lower NPV than initially estimated. Finally, McDonald and Siegel (1986) and Ingersoll and Ross (1992) argue that if the option value of waiting to start a project is sufficiently large, this may justify not investing in the project today even if its current NPV is positive. McDonald (2000) shows that under certain assumptions, using a hurdle rate higher than the true discount rate is consistent with "waiting to invest" behavior that approximates optimal decision-making.

In addition to having a buffer, Figure 3 shows that hurdle rates are sticky, changing only about two or three percentage points over the last 35 years, despite market interest rates falling substantially. This observation suggests that companies do not base hurdles tightly on a current, market-oriented cost of capital.²⁸ Hurdle rates might remain high in the face of falling interest rates if risk premia increased in an offsetting manner over the past 35 years, but that is not the prevailing view (Binsbergen (2020)). Future research should explore whether hurdle rates are sticky or ratchet upwards more quickly in an increasing interest rate environment. One executive told me that by remaining invariant, the hurdle rate was “sacred” in her company, providing a clear benchmark to facilitate decisions by mid-level employees (i.e., a coordinating device); the executive further suggested that changing the hurdle frequently would make it less sacred and could lead to less unified decision-making across the firm. Whatever the underlying cause, hurdle rates empirically reflect conservative, simple, and sticky decision rules and directly affect corporate investment outcomes.²⁹ Moreover, sticky hurdle rates make a lower cost of capital less relevant, and thus, imply that monetary policy (i.e., reducing interest rates) may not be able to spur corporate investment.

Among the minority of firms that changed their hurdle rate at least twice during the past decade, Figure 4 shows that they did so due largely to changes in borrowing costs, the risk premium, or the cost of equity. I focus on the cost of equity next.

The cost of equity. The cost of equity is an important component of the cost of capital and the standard calculation of discount rates. As with other policies, there is notable inertia in the ranking of methods to calculate the cost of equity. Figure 5 shows that as in Graham and Harvey (2001), in 2022, firms commonly rely on the CAPM to estimate the cost of equity. Relative to 20 years ago, large, public companies are now more likely to account for extra risk factors when

²⁸ See Sharpe and Suarez (2021) for analysis of the interest rate sensitivity of investment. Also, in Figure 3, I performed unreported analysis to control for sample composition over time. This analysis reveals no statistical change in the hurdle rate from one survey to the next after propensity-score matching each sample to the 2022 survey sample. Related, Section I.V of the Internet Appendix presents evidence that approximately 60% of North American firms indicate that they changed their hurdle rate once or not at all in the past decade. CFO explanations for why hurdle rates are so steady include (i) a belief that long-term investment decisions should be based on metrics that do not change much from year to year, (ii) for some firms, hurdle rate calculations are not the key metric used to choose investments, and (iii) a desire not to make decisions strictly based on precise numerical calculations (e.g., precise cost of capital calculations). One CFO told me that his firm kept its hurdle rate at 17% for decades, reducing it in 2015 by 4 percentage points in response to a pent-up need for change. In addition, many companies estimate WACC each year but do not also change the hurdle rate. One setting in which firms do frequently change discount rates is mergers and acquisitions, where WACC plays a bigger role, possibly because this is what investment banks provide in their analyses.

²⁹ Graham and Harvey (2001) document another simple capital budgeting practice, namely, using a single discount rate to value projects in a multidivisional firm, rather than an industry- or country-specific discount rate. Kruger, Landier, and Thesmar (2015) find empirical evidence that firms are more likely to use a single discount rate when the expected cost of doing so is small. See also Stein (1996).

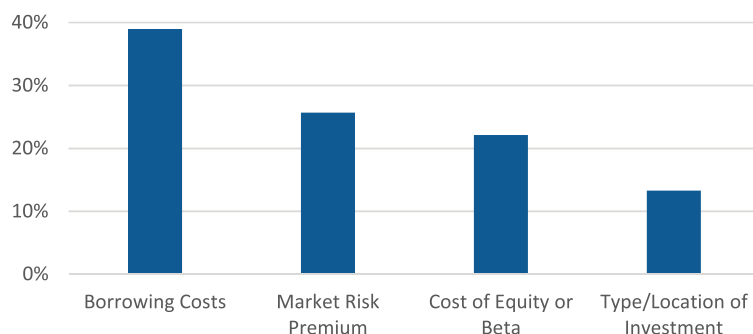


Figure 4. Reasons companies change hurdle rates. This figure displays CFO responses to the following question: *The last time you changed your hurdle rate, why did you change it?* Only firms that changed their hurdle rate at least two times in the past decade were asked this question. The bars display results for the 2022 Duke CFO survey (March 2019 wave). For example, 39% of firms that changed their hurdle rate at least two times in the past decade did so due to changes in borrowing costs. (Color figure can be viewed at wileyonlinelibrary.com)

estimating the cost of equity, though they continue to use the one-factor CAPM most often (Table III).³⁰ Widespread reliance on the CAPM, even in the face of evidence of the model's empirical shortcomings, suggests that firms rely on simple and familiar techniques. The enduring popularity of the CAPM may also reflect teaching emphasis. The figure also reveals that in 2022, many small firms indicate that their cost of equity estimate has not changed in many years, again consistent with inertia.

C. Economic Variables That Explain Changes in Corporate Investment

In this section so far, I examine internal processes and calculations behind corporate investment decisions. Investment outcomes, however, are also affected by economic forces external to the firm. In this subsection, I turn to the role of economic variables that affect corporate investment, to further inform academic modeling.

Many models link changes in outcomes to exogenous shocks that propagate through the economic system (Strebulaev and Whited (2012)). Accordingly, the survey asked CFOs which economic shocks are most important in terms of causing corporate investment in 2019 to deviate from plan. Figure 6 summarizes the results. CFOs indicate that shocks to demand, cash, and current profits are important factors influencing investment outcomes. Cash and current profits are particularly important for firms whose actual capital expenditures

³⁰ Graham and Harvey (2001) find that the extra risk factors that firms explicitly incorporate into their discount rates are more related to interest rates, inflation, and foreign exchange risk than to classic asset pricing factors. Gormsen (2020) examines Duke CFO survey data on WACC and backs out cost of equity estimates; he estimates that the market beta, size, and book-to-market factors of Fama and French (1993) explain 37% (26%) of the cross-sectional variation in cost of capital (hurdle rate) estimates.

Table III

How Do Companies Estimate the Cost of Equity?

This table presents survey responses to the following question about cost of equity methods: *How do you determine your firm's cost of equity capital? {0 = Never; 1, 2, 3, 4 = Always}.* CFOs are asked this question only if they first answered “Yes” to the question: *Does your firm estimate the cost of equity capital? {Yes, No}.* Panel A compares results from the Graham and Harvey (2001) survey to results from the 2022 Duke CFO Survey (March 2020 wave). Columns (1) and (2) display the percentage of large firms that always or almost always use a given technique (i.e., they answered a score of “3” or “4” to the question above). Columns (3) and (4) display the same for small firms. Large (small) firms have revenue greater (less) than \$1 billion. No statistical tests are performed in columns (1) to (4). Columns (5) and (6) display the average score (on a 0 to 4 scale) for each technique in the 2001 and 2022 surveys, respectively. Columns (7) to (10) display analogous information for large and small firms. For each pair of columns and each technique, a comparison of means (*t*-test) is performed (e.g., in columns (5) and (6), the mean scores for each technique are compared across the full samples in the 2001 and 2022 surveys). Panel B uses data solely from the 2022 Duke CFO Survey and displays comparisons of the frequency of use of each technique across different company characteristics (e.g., small and large firms are compared in columns (1) and (2)). Definitions of demographic variables are given in Appendix Table A.I. *, **, and *** display significance at 10%, 5%, and 1% level, respectively.

Panel A: Cost of Equity, 2001 vs. 2022 Comparison										
Percent Always or Almost Always						Score				
Survey	Large Firms		Small Firms		Full Sample		Large Firms		Small Firms	
	2001 (1)	2022 (2)	2001 (3)	2022 (4)	2001 (5)	2022 (6)	2001 (7)	2022 (8)	2001 (9)	2022 (10)
<i>N</i>	126	51	105	87	231	138	126	51	105	87
CAPM	83.05	82.61	61.86	26.58	2.92	2.14***	3.27	3.20	2.49	1.53***
Multi-Factor Model	37.84	69.05	30.30	28.77	1.56	1.81	1.70	2.62***	1.39	1.34
Historical Average	37.96	32.56	41.05	17.33	1.72	1.20***	1.65	1.51	1.80	1.03***
Investor Expectations	6.60	29.55	22.11	18.18	0.86	1.12*	0.54	1.27***	1.22	1.04
Dividend Discount Model	15.69	17.50	15.79	13.33	0.91	0.76	0.87	0.92	0.96	0.67
Market Return ('22 only)		16.67		20.51		1.06		0.95		1.12
Regulatory Decisions	8.57	14.29	5.32	18.67	0.44	0.89***	0.50	0.83*	0.37	0.92***
Unchanged Estimate ('22 only)		11.36		29.11		1.21		0.66		1.52

(Continued)

Table III—Continued

Panel B: Cost of Equity, Conditional on Company Characteristics													
	Size		Public		Growth Prospects		Pay Dividends		Leverage		Cash		Financial Flexibility
	Small (1)	Large (2)	No (3)	Yes (4)	No (5)	Yes (6)	No (7)	Yes (8)	Low (9)	High (10)	Low (11)	High (12)	No (13) Yes (14)
<i>N</i>	87	51	81	57	43	82	41	33	23	23	66	47	14 124
CAPM	1.53	3.20***	1.66	2.78***	1.66	2.31**	1.78	2.14	2.14	2.50	2.19	1.70	0.91 2.26***
Multifactor Model	1.34	2.62***	1.59	2.13*	1.36	1.87	1.61	2.11	1.37	2.05	1.76	1.56	1.82 1.81
Historical Average	1.03	1.51*	1.06	1.42	1.60	0.92**	1.14	1.59	0.90	1.00	0.98	1.34	1.23 1.20
Investor Expectations	1.04	1.27	0.90	1.45**	1.34	0.82**	1.00	1.45	1.05	0.78	0.98	1.12	1.00 1.14
Dividend Discount Model	0.67	0.92	0.71	0.82	0.64	0.63	0.83	0.81	0.45	0.78	0.78	0.59	0.33 0.81
Market Return	1.12	0.95	1.21	0.83	1.17	1.01	0.94	1.33	1.33	0.72	0.87	1.44**	0.27 1.14**
Regulatory Decisions	0.92	0.83	0.93	0.84	1.26	0.62***	0.76	1.29	0.71	0.90	0.73	1.05	0.67 0.91
Unchanged Estimate	1.52	0.66***	1.59	0.63***	1.35	1.17	1.56	1.19	1.33	0.75	1.05	1.57*	1.83 1.14

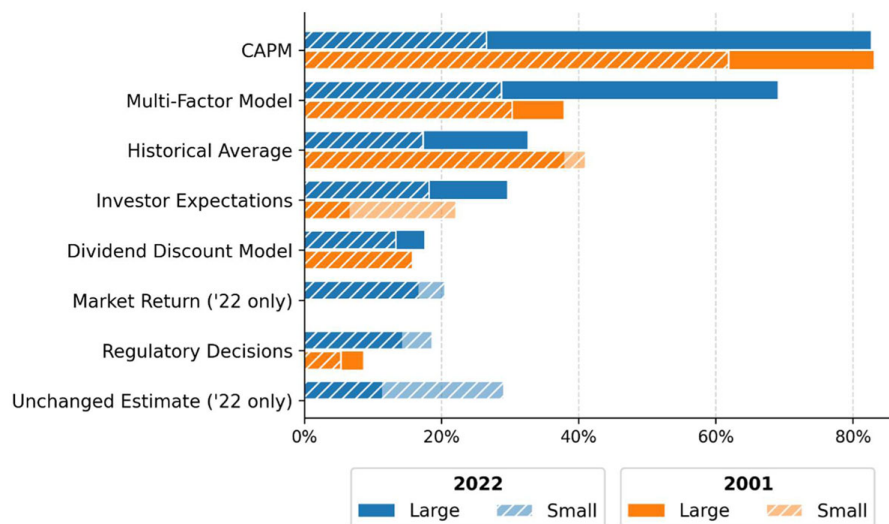


Figure 5. How do companies estimate the cost of equity? This figure displays CFO responses to the following question: *How do you determine your firm's cost of equity capital?* {0 = Never, 1, 2, 3, 4 = Always}. The percent who answered "3" or "4" are presented. CFOs are asked this question only if they first answered "Yes" to the question: *Does your firm estimate the cost of equity capital?* {Yes, No}. Blue (top) bars display results for the 2022 Duke CFO survey (March 2020 wave); orange (bottom) bars display results from Graham and Harvey (2001). Within each blue and orange bar, the solid portion displays responses for large firms (revenue above \$1 billion), while the crosshatched portion displays responses for small firms (revenue below \$1 billion). In 2022, for example, 83% of large firms (29% of small firms) always or almost always use the CAPM to estimate their firm's cost of equity capital. (Color figure can be viewed at [wileyonlinelibrary.com](https://onlinelibrary.wiley.com))

in 2019 fell short of expectations (orange (top) bars), suggesting that these firms may have faced financial constraints or a high cost of external funds, consistent with investment being sensitive to cash flows. The effect of current profits on investment is also consistent with a near-term focus. Among firms that exceeded spending plans in 2019, some explanations point to unexpectedly high demand, consistent with difficulty anticipating tail outcomes. The results also indicate that in 2019, when interest rates were low, corporate investment was not sensitive to the interest rate, in line with the nearly static hurdle rate described above and with Duke surveys in 2004Q2, 2010Q4, 2012Q3, 2013Q3, and 2014Q1 that similarly document a lack of investment-interest rate sensitivity. I discuss the latter finding more below (see also Sharpe and Suarez (2021)).

Figure 6 presents evidence on shocks that cause firms to deviate from planned investment. A separate question asks which macroeconomic variables are ex ante expected to cause a firm to realize a good, bad, or middling scenario. For U.S. firms, GDP growth and consumer spending rank most important (see Appendix Figure A.3). In sum, the key variables in Figures 6 and A.3 may help inform future economic inquiry and structural models.

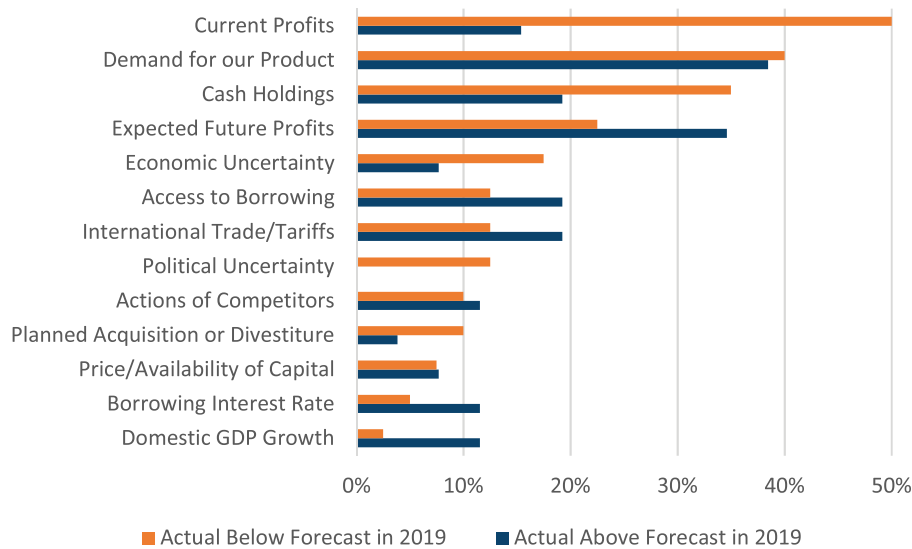


Figure 6. Reasons that capital spending outcomes differ from forecasts. This figure displays CFO responses to the following question: *Why was your actual 2019 capital expenditures higher/lower than your 2019 forecasted capital expenditures?* The presented results are for firms that first chose “Capital Expenditures” (possibly along with another item) in response to the question: *Considering the actuals vs. forecasts shown in the table above, for which items did the difference between actual and forecast have the biggest impact on your firm? (check up to two)* Blue bottom (orange top) bars display results for firms with 2019 actual capital spending greater than (less than) 2019 forecasts. For example, among firms for which realized 2019 capital expenditures were less than their 2019 forecast (orange bar), 50% of these firms say that “Current Profits” were a primary reason that they undershot capital spending. (Color figure can be viewed at wileyonlinelibrary.com)

D. Investment and Capital Budgeting Takeaways

- Capital budgeting and cost of equity decision rules are generally simple.
 - Decision rules of small firms appear to reflect constraints or liquidity concerns.
- Hurdle rates, capital budgeting methods, and cost of equity methods tend to be sticky over time.
- Firms set hurdle rate \gg WACC thus creating a buffer, which is conservative in the sense of firms investing only in projects that they expect to be $NPV \gg 0$, which may compensate for underestimating the likelihood or severity of possible downside events.
- Corporate investment appears to be insensitive to interest rates (at the time and in the setting of the survey).
- Profit and demand shocks lead capital investment to deviate from plan.
- Sections III and IV of the [Internet Appendix](#) contain additional information on the relative importance of NPV and on the frequency of hurdle rate changes.

III. Corporate Planning and Internal Forecasts

Given that hurdle rates do not change much over time, changes in cash flow forecasts are likely more important for within-firm variation in investment.³¹ Yet, research on the planning process behind cash flow forecasts, as well as how planning underlies and affects other policy decisions, is scarce.³² In this section, I lay out basic features of corporate planning processes that underlie cash flow forecasts and outcomes. The section explores the short horizon of reliable planning forecasts, miscalibration, how firms dynamically change forecast and policy variables in reaction to forecast error and economic shocks, and the importance of sales growth projections. The [Appendix](#) and Sections V and VI of the [Internet Appendix](#) present additional information on corporate planning.

A. Scenarios

The CFO surveys suggest that companies construct on average three scenarios as part of their planning process. Most scenarios are of a downside/base case/upside nature ([Appendix Figure A.1](#))—with the scenarios generally applying to company-wide outcomes (they occasionally apply to a particular division or project).³³ The base case reflects the “most likely” outcome, not necessarily the expected value, and is the basis of most budgeting and cash flow forecasts. Most firms use downside scenarios to plan for contingencies (e.g., what to cut and by how much if a bad outcome occurs), consistent with trying to avoid or manage the costs of distress³⁴ (see [Appendix Table A.III](#)). This result implies that downside mistakes are costly. Upside scenarios often lay out stretch goals and are generally used to motivate employees. Downside and especially upside scenarios are often developed in less detail than the base case.³⁵

³¹ Using data from the Duke CFO survey, Gennaioli, Ma, and Shleifer (2016) confirm that cash flow expectations are a significant predictor of both capital spending plans and realizations. Also, as reported in [Section II](#), the importance of demand, current profits, and overall economic activity imply that cash flows are important drivers of investment.

³² A growing literature explores managerial expectations (e.g., Ben-David, Graham, and Harvey (2013), Gennaioli, Ma, and Shleifer (2016), Boutros et al. (2021), Barrero (2022)), investors (e.g., Greenwood and Shleifer (2014), Andonov and Rauh (2020), Giglio et al. (2021)), and macroeconomic outcomes (e.g., Malmendier and Nagel (2016), Coibion and Gorodnichenko (2012, 2015), Bordalo et al. (2020b)).

³³ Large firms are more likely to create division-level scenarios than are small firms, though the survey did not ask whether CFOs aggregate division-level scenarios to create their company-wide scenarios.

³⁴ Results presented below indicate that concerns about distress also have large impact on capital structure decisions.

³⁵ Base-case scenarios are the most fully developed and are central to the business plan. Downside scenarios focus primarily on how firms should react to negative shocks, though they do not necessarily lead to fleshed-out forecasts or pro forma financial statements. Upside scenarios often boil down to stretch targets for a few variables. (Bolton and Faure-Grimaud (2009) model action plans that are intentionally incomplete due to the time costs of deliberation.) A common perspective seems to be to expect the typical but prepare for the bad (though due to miscalibration, tail outcomes may not be fully anticipated), with less formal attention paid to upside scenarios. Future

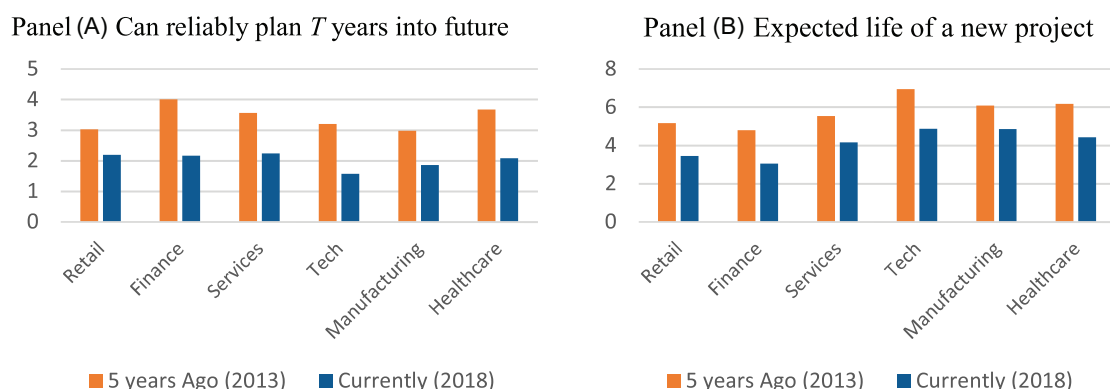


Figure 7. Reliable planning horizon and project life. This figure displays information about the horizon over which CFOs believe that their corporate plans are reliable (Panel A) and the productive life of their investment projects (Panel B). Data are from the September 2018 Duke CFO Survey. In Panel A, the blue (right) bars display how many years into the future firms in the 2018 survey could plan into the future; the orange (left) bars display the recollection of CFOs about the reliable planning horizon as of five years earlier (i.e., in 2013). The bars in Panel B display the analogous averages for the length of the productive life of a project. (Color figure can be viewed at wileyonlinelibrary.com)

B. Forecast Horizon

Many companies develop a 5- or 10-year plan, but CFOs indicate that the horizon for reliable planning information is much shorter, with the first and possibly second years serving as the basis for budget decisions. For example, Figure 7 shows that the 2018Q3 Duke CFO survey finds that U.S. companies' CFOs believe only that the first two years of company forecasts are reliable, versus three reliable years as of 2013. Over this same 2013 to 2018 period, the average life of investment projects dropped by one to two years. Thus, increased uncertainty has reduced the horizon over which forecasts are thought to be reliable and, in turn, the horizon of projects being chosen. This form of short-termism is driven by limited ability to forecast the future rather than bad governance or external pressures (see also Graham, Harvey, and Rajgopal (2005), Bebcuk, Brav, and Jiang (2015), and Kaplan (2018)). As one CFO explained, a short, reliable planning horizon leads to conservative decision-making because conservative decisions leave firms with more options and flexibility in the future (see also Barry et al. (2022)). Near-focused decision rules like payback also align well with short-horizon planning and project selection.

C. Revenue and Profit Margin Focus

The 2019 wave of the survey asked CFOs to report forecasts for about a dozen variables, including variables related to sales, spending, and hiring, while the

research could examine whether this approach prepares the typical firm to exploit upside opportunities, under what conditions this approach to planning is optimal, and the potential negative consequences of this approach.

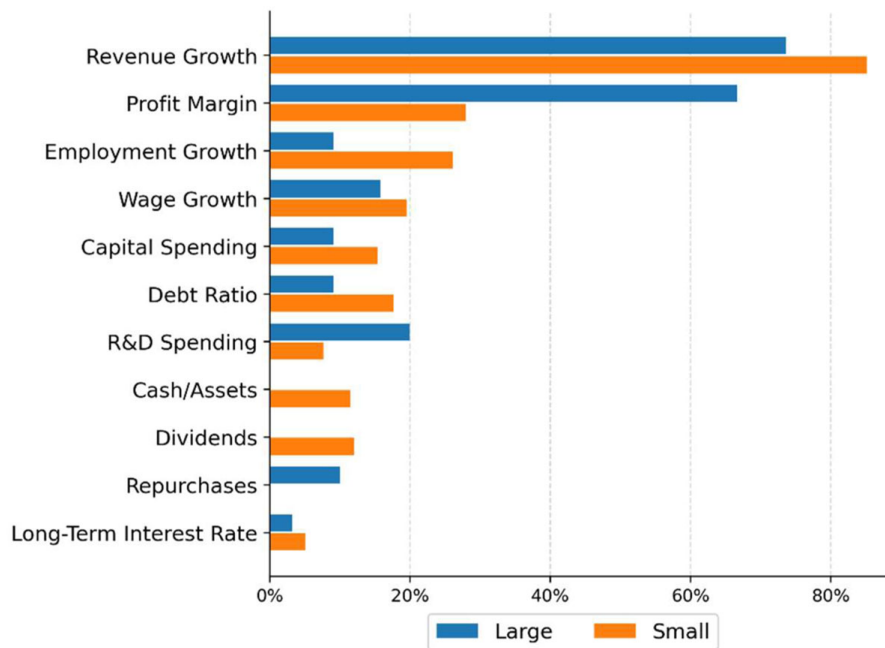


Figure 8. Which internal forecasts have the biggest impact? This figure displays CFO responses to the following question: *Considering the actuals vs. forecasts [for 2019] shown in the table above, for which items did the difference between actual and forecast have the biggest impact on your firm? (check up to two)* This question appeared in the 2022 Duke CFO Survey (2020 wave). Blue (top) bars display responses for large firms (revenue above \$1 billion); orange (bottom) bars display responses for small firms (revenue below \$1 billion). For example, 74% of large firms (85% of small firms) say that the difference between actual and forecasted revenue growth was one of the two differences that most impacted their firm. The denominator for each variable is the number of firms for which the CFO provided data on both actual and forecasted values of a given variable. (Color figure can be viewed at wileyonlinelibrary.com)

2020 wave asked CFOs to report actual values for these variables. I am therefore able to calculate forecast errors (investigated below). As Figure 8 shows, CFOs of both large and small firms indicate that among the variables that companies forecast, missing a revenue forecast is most consequential, suggesting an important top-down element in planning.³⁶ Missing a profit margin target is the second-most consequential forecasting error, especially for large firms. Appendix Table A.II provides information on the forecast accuracy of each variable. Surprisingly, the revenue forecast is the least accurate among the forecasted variables considered.

The CFO surveys provide evidence consistent with self-attribution bias in that executives are more likely to “blame the market” if revenues miss on the

³⁶ This suggests that (i) topline revenue growth is a primary objective of the firm and/or (ii) revenue is a summary statistic for important corporate outcomes. Interestingly, only about half of NYSE firms reported sales revenue prior to the Securities and Exchange Act of 1934 explicitly requiring that sales be reported (Binz and Graham (2022)), implying that (iii) managers view sales forecasts as strategically important. Baumol (1959) explores maximizing revenues subject to a profit constraint.

downside (relative to forecast) but take credit if revenues overperform: when the realization exceeds the forecast, 64% of CFOs attribute the outperformance to firm actions or performance while only 36% attribute it to changing market conditions; whereas when the realization falls short of the forecast, 62% blame the market and only 44% attribute it to firm actions or performance. This pattern can lead forecasters to narrow distributions too much (widen them too little) after a past success (failure), leading to posterior distributions that are too narrow, and thus contributing to miscalibration.³⁷

I next explore the extent to which planning forecasts are miscalibrated, underestimating the left tail in particular, and how firms react dynamically to forecast error and economic shocks. For example, do companies update their forecasts to widen the distribution in the direction of a missed forecast and/or do they alter real policy choices? Recall that the goals of this section are to better understand internal forecasts and corporate planning in their own right, as well as to provide context to understand how planning might drive many corporate decisions.

D. Miscalibration

Prior research indicates that executive forecasts are miscalibrated, with forecast distributions that are too narrow and underestimate the frequency of occurrences in the tails of the distribution. For example, studying the Duke CFO survey, Ben-David, Graham, and Harvey (2013) and Boutros et al. (2021) show that CFOs' S&P500 return forecasts are miscalibrated in that only about 30% (rather than 80%) of ex post realizations fall within ex ante 10th to 90th percentiles, and Ben-David, Graham, and Harvey (2013) show that managerial IRR forecasts tied to corporate investment are also miscalibrated. My respondents significantly overlap with the same pool of Duke CFO survey participants as in Ben-David et al. and Boutros et al.; and in fact, only 26% of S&P500 return forecasts realizations fall within ex ante 10th and 90th percentiles for the CFOs in my sample.

In the 2022 surveys, CFOs provided 10th and 90th percentile forecasts as well as best-guess forecasts of revenues for 2019 and 2020. While my sample is too short to robustly demonstrate miscalibration, Figure 9 shows that the 2019 forecasts underestimate the lower and upper tails of own-firm revenue forecasts.³⁸ For comparison, at year-end 2018, economists covered in the Livingston Survey expected 2.4% (2.3%) annualized real GDP growth in the

³⁷ See Hertwig et al. (2004), Moore, Tenney, and Haran (2015), Libby and Rennekamp (2011), and Gervais and Odean (2015) for related research. In addition to miscalibration, Payzan-LeNestour and Woodford (2022) argue that individuals are “blind to outliers” (i.e., perceive tail events as less extreme than they are) due to a neurobiological phenomenon that leads humans to allocate neuro resources to the most likely outcomes.

³⁸ Examining SBU survey data from 2014 to 2019, Barrero (2022) documents substantial miscalibration in sales forecasts and shows that managerial forecasts overextrapolate (i.e., good/bad past performance leads to forecasts of continued good/bad performance).

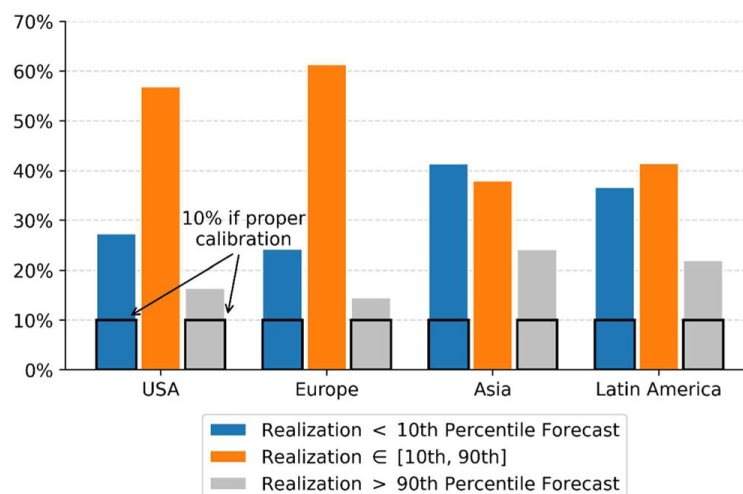


Figure 9. Revenue calibration by region. This figure explores the calibration of CFO revenue forecasts, comparing 2019 actuals to 2019 forecasts. Data are from both waves of the 2022 CFO Survey. The first wave (March 2019) asked CFOs to report the 10th percentile, best-guess, and 90th percentile revenue growth forecasts for 2019. The second wave (March 2020) then asked CFOs for their firm's 2019 revenue growth realization. Blue (leftmost) bars display the percentage of actual revenue observations below the 10th percentile of the forecasted value; orange (middle) bars display the percentage of actual revenue observations within the 10th and 90th percentiles of the forecast distribution; gray (rightmost) bars display the percentage of actual revenue observations above the 90th percentile of the forecasted value. For example, 28% of CFOs in the U.S. indicate that 2019 actual revenues for their firm were below the 10th percentile of their 2019 forecasted revenue distribution. (Color figure can be viewed at wileyonlinelibrary.com)

first (second) half of 2019, and actual real GDP growth for 2019 was 2.3%, in line with expectations. Having said that, the Federal Reserve reduced interest rates in the second half of 2019 in response to perceived moderate economic weakening.

As I discuss above, many corporate policies appear to be conservative, which I argue may help offset underestimation of the likelihood (and possibly severity) of left-tail outcomes.³⁹ Future research should investigate additional consequences of miscalibration. While downside miscalibration may have negative consequences should the downside occur, ex ante underestimating the downside (and instead emphasizing the upside) may be beneficial for executives due to career concerns. For example, if a company presents forecasts with substantial downside to bankers or credit markets and competitors do not, the firm may not obtain the desired funding. Also, to the extent that it is difficult for managers who focus on the downside to climb the company ladder

³⁹ A managing director at an investment bank noted that when the price of oil was \$100/barrel more than a decade ago, the worst-case scenario that his energy client firms considered in their five-year plans was \$80/barrel (either because they did not think that a lower price was reasonable or because they did not want to recognize a lower price in their plans). After weeks of haranguing, the banker was able to persuade the energy firms to consider a worst case of \$70/barrel. Shortly thereafter, the price of oil fell well below \$70 and remained there for many years.

to the C-suite (e.g., Goel and Thakor (2008)), managers may have incentives to project confidence rather than emphasize the downside.

E. Dynamic Reactions to Economic Shocks and Missed Forecasts

E.1. Dynamic Changes to Forecasts

Given the importance of cash flow projections for many company decisions, I next explore how corporate forecasts change in response to changing economic circumstances. In particular, I examine (i) whether missing their 2019 forecasts leads companies to change the first or second moments of their 2020 forecasts and their real decisions, and (ii) how the COVID-19 shock of March 2020 affected corporate planning and decisions. This analysis should be updated and expanded in future research.

As background, Boutros et al. (2021) use data from 2001 to 2017 to examine 10th and 90th percentiles and best-guess forecasts of S&P500 returns provided by CFOs in the Duke survey (the same survey population as my survey, though not necessarily the same respondents). They find that when a realization falls below (above) the 10th (90th) percentile of a CFO's ex ante forecast, the CFO tends to reduce the lower bound (increase the upper bound) in the next forecast. In this sense, CFOs “learn from their mistakes” and miscalibration may be somewhat reduced. However, the learning is partial and improvement plateaus after a few quarters. Thus, forecast distributions are sticky in that they do not fully reflect all new information.

The surveys examined in this paper focus on corporate decision-making. The CFOs provide 10th and 90th percentile and best-guess forecasts of 2019 revenues (blue (left) lines in Figure 10) and 2020 revenues (orange (right) lines). For “accurate” 2019 forecasts (2019 realization is within ex ante 10th and 90th percentiles), the width of the distribution shrinks in 2020. For “low-miss” and “high-miss” firms (2019 realization below (above) the 2019 forecasted 10th (90th) percentile), the 2020 distribution width remains relatively unchanged. Thus, in a relative sense, distributions are wider for firms that miss a previous forecast. In addition, the best-guess forecast falls more for firms that underperformed in 2019 (though the decrease is not statistically different than for the other two subgroups). The results imply that for revenue forecasts in the given period, the second moment of forecast distributions reacts more to forecast errors than does the first moment.

Figure 11 presents 2020 forecasts conditional on the negative COVID-19 shock. As shown in Barry et al. (2022), before mid-March 2020 most U.S. companies thought that any effects of COVID on the U.S. economy would be minimal. Consistent with this perspective, the two lines in the middle of the figure indicate that before March 15, most firms expected their 2020 sales prospects to be similar to 2019, regardless of whether their assessment of own-firm financial risk due to COVID was high (orange) or low (blue). In contrast, by mid-March as it started to become clear that the United States might experience significantly negative COVID effects, the distribution of possible

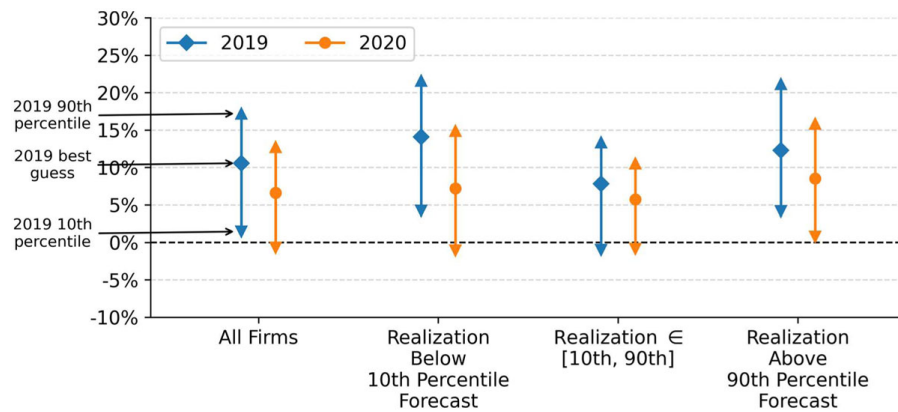


Figure 10. Impact of past forecast errors on future forecasted revenue distributions.

This figure displays the distributions of 2019 and 2020 forecasted revenue, conditional on the accuracy of the 2019 forecast as reflected on the x-axis. Data are from both waves of the 2022 CFO Survey. The first wave (March 2019) asked CFOs to report revenue growth forecast distributions for 2019. The second wave (March 2020) then asked CFOs for the same information for 2020, as well as 2019 realizations. To minimize possible effects of the COVID shock on 2020 numbers, only responses received before March 15, 2020 are included in this analysis. Blue (left) lines display the 10th percentile (lower arrowhead), best-guess (diamond), and 90th percentile (upper arrowhead) averaged across firms for 2019 revenue growth forecasts. Orange (right) lines display the same information for 2020 revenue growth forecasts created in 2020. Starting from the far right, the x-axis divides firms into those whose realization was above the 90th percentile forecast in 2019, those whose realizations fell between the 10th and 90th percentiles, and those whose realization was below the 10th percentile forecast for 2019. (Color figure can be viewed at wileyonlinelibrary.com)

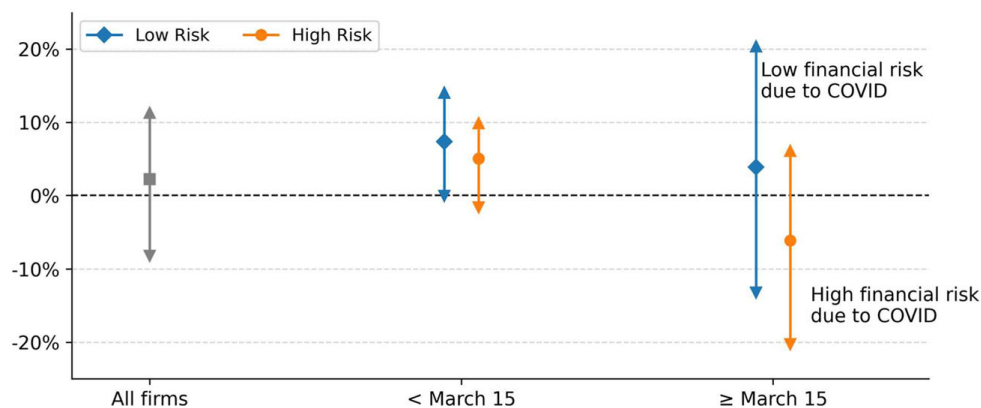


Figure 11. Impact of COVID-19 shock on 2020 revenue forecast distributions. This figure displays firms' 2020 revenue forecast distributions by level of COVID-related financial risk, for forecasts made before versus after March 15, 2020 (an inflection point for U.S. firms becoming aware of the severity of the COVID crisis). Blue (left) and orange (right) lines display results for firms that say they face low and high COVID-related financial risk, respectively. For each line, the top arrowhead denotes the 90th percentile forecast and the bottom arrowhead denotes the 10th percentile; the diamond (left)/dot (right) gives the average best-guess forecast. The data are from the 2020 wave of the survey. (Color figure can be viewed at wileyonlinelibrary.com)

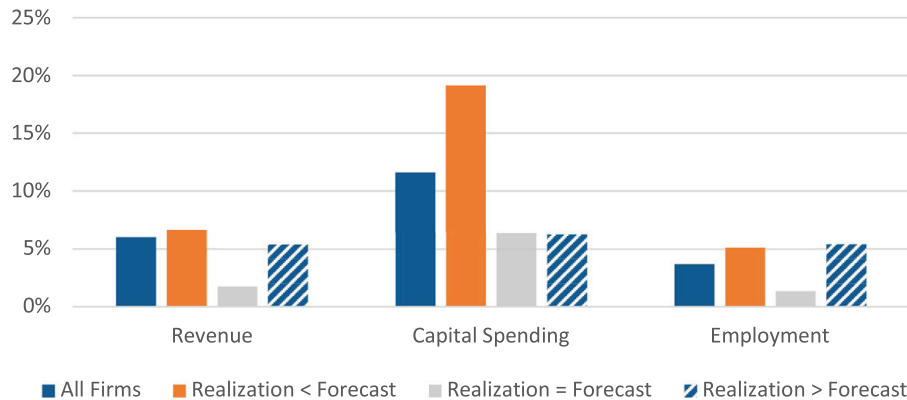


Figure 12. Effect of 2019 forecast errors on revenue, capital spending, and employment plans for 2020. This figure displays winsorized forecasts of growth in 2020 revenues, capital spending, and employment, conditional on the relation between realizations and forecasts for 2019. The four bars display (separately for each variable) the average forecasted 2020 growth for all firms (blue, leftmost), firms with realized 2019 growth below the forecasted value for 2019 (orange, second from left), firms with realized 2019 growth equal to their forecasted value (gray, third from left), and firms with realized growth above the forecasted growth (blue patterned, rightmost). The 2020 forecasts were made prior to March 15, 2020 to attenuate possible effects of the COVID-19 shock on 2020 forecasts. The sample includes firms that appear in both waves (March 2019 and March 2020) of the 2022 CFO Survey. (Color figure can be viewed at wileyonlinelibrary.com)

2020 outcomes widened considerably for both high- and low-risk firms. In particular, these firms (especially high-risk firms) started to consider much worse left-tail possibilities than considered before March 15. Interestingly, the low-COVID-risk firms had similar pre- and post-March 15 best-guess forecasts and on average increased their upside forecasts.

One implication from Figures 10 and 11 is that, relative to a benchmark, forecast errors and negative shocks affect the second moment of subsequent forecasts. Such patterns should be captured by dynamic cash flow or corporate planning models. As discussed above, Boutros et al. (2021) show in their setting that second-moment adjustments are in the right direction but relatively small.

E.2. Dynamic Changes to Real Outcomes

Figure 12 explores 2020 revenue, capital spending, and employment plans after a company misses its 2019 forecast. Note that the 2020 plans correspond to firms that responded before March 15, 2020 to avoid confounding effects of COVID on corporate planning. For capital expenditures, firms that underspent in 2019 (orange bars) have strong 2020 plans, as if they intend to make up the difference. The capital spending patterns can be thought of as a form of inertia (multi-year objectives). Section V of the [Internet Appendix](#) contains additional information about why forecast errors occur and firm responses to missed revenue forecasts.

F. Planning and Internal Forecasting Takeaways

- Most companies make scenario plans, primarily for downside, base-case, and upside company-wide scenarios.
 - Ex post, GDP growth and consumer spending are the macro forces that have the greatest effect on whether a firm ends up in a downside, base case or upside outcome (see Appendix Figure A3).
- Forecast distributions are typically too narrow and underestimate the tails of possible outcomes (more than 10% of realizations fall below (above) the forecasted 10th (90th) percentile of the ex ante distribution, indicating miscalibration). I argue that other corporate policies may be designed as conservative to offset downside miscalibration.
 - Executives often take credit for success and blame the market for failure. Such self-attribution may contribute to miscalibration.
- The revenue forecast is paramount (in that hitting/missing the revenue forecast is most important in terms of its consequences on the firm and its plans). Profit margins are second most important.
- An inaccurate forecast in one year leads to relatively wider second moments for forecasts made the following year.
- The COVID shock led to wider forecast distributions in general. For high-COVID-risk firms, expected outcomes fell. For low-COVID-risk firms, upside possibilities increased.
- Capital spending behaves as if it follows a multiyear plan and in this sense exhibits inertia: companies plan to get back on track if in the previous year they went off track.
- Creating and modifying plans takes time and resources, which may contribute to infrequent changes in (sticky) corporate policies.
- Section V of the [Internet Appendix](#) contains additional information about why forecast error occurs and actions companies take (or do not take) when their revenue forecast is inaccurate.
- The [Appendix](#) and Section VI of the [Internet Appendix](#) contain additional information about planning for downside outcomes and best practices when uncertainty is high.

IV. Capital Structure

The survey asks CFOs a number of capital structure questions: Do companies have leverage targets? If so, are targets strict or is there an acceptable range (and how large is that range)? How often do targets change? What factors determine the ideal amount of debt? What aspects of financial flexibility are important? Are various sources of external funding fungible once raised? As described below, the key findings relate to sticky decision processes, debt conservatism, flexible debt targetting, financial flexibility, market timing, and a pervasive view that equity is undervalued.

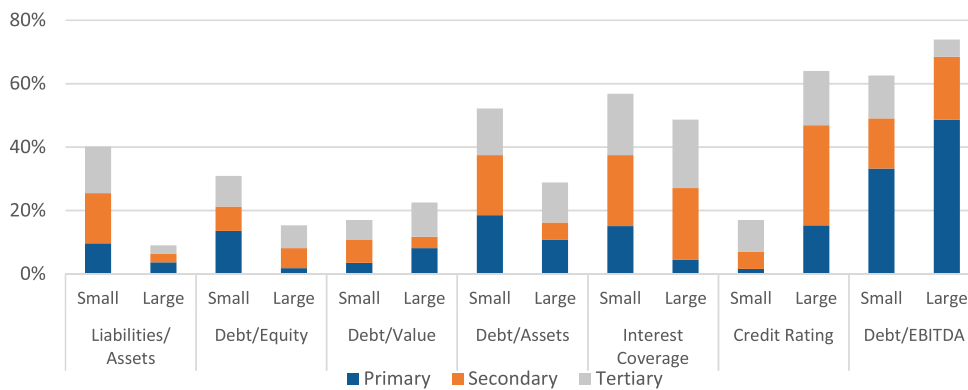


Figure 13. How do companies measure leverage? This figure displays CFO responses to the following question: *When you consider the appropriate amount of debt for your firm (optimal capital structure), what are the primary metrics your company uses? (rank your top 3)* The blue bottom bars display results for the primary choice. The orange middle (gray top) bars display results for the secondary (tertiary) choices, respectively. The results are presented conditional on firm size. Large firms have annual revenue greater than \$1 billion, and small firms have annual revenue less than \$1 billion. For example, 49% of CFOs from large firms indicate that their primary measure of capital structure is debt/EBITDA (and 74% say that it is one of their top three debt measures). (Color figure can be viewed at wileyonlinelibrary.com)

A. Debt Policy

I start with a very basic question: What measure do companies use when they evaluate their debt usage? Figure 13 and Table IV present evidence that debt/EBITDA is the most popular measure of debt usage: more than 70% of large firms and approximately 60% of small firms rely on this measure as one of their three most frequently used debt ratios.⁴⁰ Reliance on debt/EBITDA may be due to firm preference or it may be required by lenders (via debt covenants⁴¹) or credit rating agencies (lease-adjusted debt/EBITDA is a key input in credit ratings). The role of credit ratings and covenants is particularly relevant for firms that underestimate the left tail of possible outcomes.

After debt/EBITDA, credit ratings (among large firms) and interest coverage (among small firms) are the next-most popular debt measures. These results are surprising, given that most studies measure leverage using debt/assets or debt/value, which the survey indicates are not as heavily relied upon (Table IV)⁴²—in *The Journal of Finance* articles published since 2015 that mention leverage, 86% use debt/assets or net debt/assets to measure

⁴⁰ Debt/EBITDA is a rough measure of how many years of cash flow would be required to pay off outstanding debt, or more broadly, of the ability to service debt. This measure has long been favored by investment bankers, which may promote its use among CFOs.

⁴¹ Griffin, Nini, and Smith (2019) show that debt/EBITDA is included in the most commonly used covenant packages and that in recent years, an increasing use of cash flow-based covenants has improved the signal-to-noise ratio of covenant violations. See also Chava and Roberts (2008), Sufi (2009), and Lian and Ma (2021).

⁴² Companies often use debt-to-value to determine WACC, but when evaluating their debt usage generally rely on different leverage measures (as shown in Figure 13).

Table IV
What Metrics Do Companies Use to Measure Debt Usage?

This table displays CFO responses to the following question about their primary debt measures: *When you consider the appropriate amount of debt for your firm (optimal capital structure), what are the primary metrics your company uses? (rank your top 3)* This table displays comparisons of the percentage across different company characteristics (e.g., small and large firms are compared in columns (4) and (5)). The rankings in columns (4) to (13) are averages with primary = 3, secondary = 2, and tertiary = 1. This table uses data from the 2022 Duke CFO Survey (March 2019 wave). For each pair of columns and each debt measure, a comparison of means (*t*-test) is performed in columns (4) to (13). Definitions of demographic variables are given in Appendix Table A.I. *, **, and *** display significance at 10%, 5%, and 1% level, respectively.

Percent Primary, Secondary or Tertiary (All Firms)			Conditional on Company Characteristics										
			Size		Public		Leverage		Cash		Financial Flexibility		
	Primary (1)	Secondary (2)	Tertiary (3)	Small (4)	Large (5)	No (6)	Yes (7)	Low (8)	High (9)	Low (10)	High (11)	No (12)	Yes (13)
N				263	111	251	123	183	167	185	129	41	333
Debt/EBITDA	37.84	17.03	11.08	1.46	1.91***	1.44	1.90***	1.45	1.78**	1.74	1.47*	1.56	1.59
Interest Coverage	11.89	22.43	20.00	1.10	0.80**	1.16	0.71***	1.00	1.07	1.15	0.88**	1.02	1.01
Debt/Assets	16.22	14.86	14.05	1.07	0.56***	1.16	0.44***	1.11	0.73***	0.72	1.23***	0.90	0.92
Credit Rating	7.30	16.31	14.16	0.31	1.35***	0.29	1.29***	0.51	0.80**	0.72	0.52	0.58	0.69
Liabilities/Assets	7.84	11.89	11.08	0.76	0.19***	0.76	0.24***	0.73	0.40***	0.38	0.94***	0.83	0.56*
Debt/Equity	10.00	7.30	8.92	0.65	0.25***	0.60	0.38**	0.57	0.49	0.54	0.54	0.56	0.53
Debt/Value	4.86	6.22	7.57	0.32	0.42	0.26	0.54***	0.31	0.40	0.45	0.21***	0.37	0.35

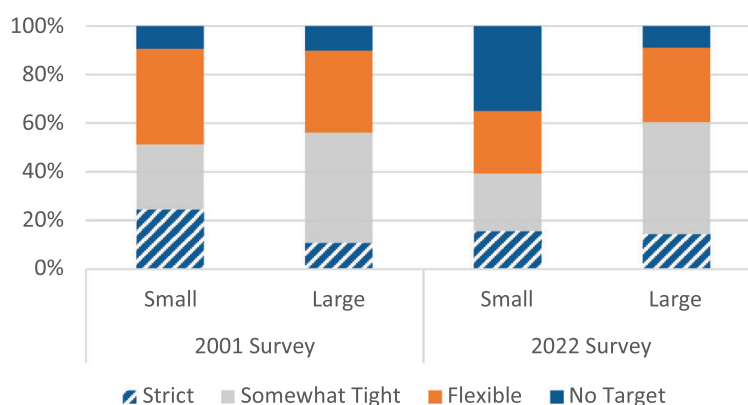


Figure 14. Do firms have target debt ratios? This figure displays 2001 and 2022 CFO responses to the following question: *Does your firm have a target for how much debt to use?* The results are presented conditional on firm size. Firms with annual revenue greater than \$1 billion are defined as “large”; firms with annual revenue less than \$1 billion are “small.” Blue (top) bars display results for no target/range. Orange (second from top) bars display results for flexible target/range. Gray (third from top) bars display results for somewhat tight target/range. Patterned (bottom) bars display results for strict target/range. For example, in the 2022 survey, 60% of large firm CFOs say that they have a strict or somewhat tight debt target. (Color figure can be viewed at wileyonlinelibrary.com)

indebtedness and none use debt/EBITDA. It would be worth investigating whether research implications are sensitive to the choice of debt measure (e.g., Liu and Shivdasani (2019), Bolton, Wang, and Yang (2021)). For example, the fact that few companies target debt/value or debt/equity might help explain Welch's ((2004)) finding that firms do not counteract changes in these ratios that are due to stock price changes. Internet Appendix Table IA.IX shows reasonably high correlations among leverage ratios using annual data but lower correlations when the variables are measured quarterly. In addition, two of the three most popular debt measures have flows in the denominator, indicating a near-term focus relative to an asset- or value-denominated variable. Flow variables are also more volatile than debt divided by assets or value (see Section VII of the Internet Appendix) and hence might lead to flatter objective functions or more conservative policies. More broadly, a change in interest rate might affect debt targets differently for many of the debt variables. Finally, the top three measures in Figure 13 focus on debt service, which is consistent with a conservative capital structure focus.

Traditional trade-off theories of capital structure (e.g., Myers and Robichek (1966), Scott (1976)) predict that firms have static optimal debt targets. Fischer, Heinkel, and Zechner (1989) and others create dynamic models that imply an optimal range for debt, where the company allows its debt ratio to vary until it reaches an upper or lower bound, at which point action is taken to push it back toward optimal. Figure 14 provides evidence on target debt ratios and shows that, similar to 2001, in the 2022 survey 60% of large U.S. firms indicate that they have a tight or somewhat tight range for how much debt to use. However, while small firms targeted at roughly the same rate as large firms

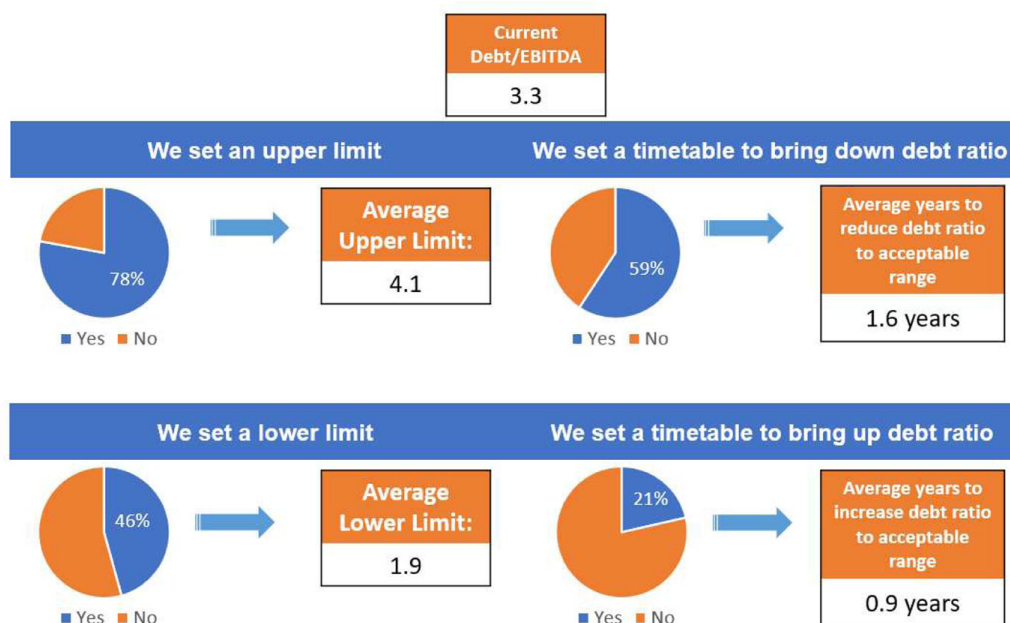


Figure 15. Debt ratio ranges and timetable to return to target. This figure displays March 2019 CFO responses to questions about whether they set an upper or lower bound as part of an acceptable range for their target debt ratios. These responses are only displayed for firms that indicated that they had a strict, somewhat tight, or flexible debt range (in Figure 14), among firms that indicated debt/EBITDA was their primary debt metric (Figure 13). Mean debt/EBITDA was 3.3 among these firms at the time of the survey. Of these firms, 78% indicated that they set an upper-limit debt ratio, with a mean upper limit of 4.1, and 59% of these firms set a timetable to reduce their debt ratio when it hit the upper limit, with a mean of 1.6 years. The lower limit results shown at the bottom are interpreted analogously. (Color figure can be viewed at wileyonlinelibrary.com)

in 2001, fewer than 40% of small firms target in 2022. Taken together, the evidence indicates inertia in targeting among large firms whereas small firms have moved toward more flexible capital structures. Table V further shows that highly levered firms are more likely to target debt usage.

To investigate whether debt targets are narrowly focused or flexibly tied to ranges, two related questions were asked: How wide and symmetric is the band of acceptable debt ratios? How quickly do companies alter their debt to move back within the acceptable range? For the firms that target debt/EBITDA, Figure 15 reports that their debt ratio at the time of the survey averaged 3.3, and 78% of these firms indicate that they set an upper bound (which on average is 4.1). These companies indicate that it would take them on average 1.6 years to push their debt ratio back down to an acceptable level. Such slow-moving debt policy changes are generally consistent with Korteweg et al. (2022), who argue that firms on average adjust capital structure greater than 5% of asset value only once every 2.5 years. Forty-six percent of debt/EBITDA companies set a lower debt limit, and for these firms, the lower limit averages about 1.9. Analogous results aggregated across all firms (not just firms that focus on debt/EBITDA) are shown in Table VI, which

Table V
Do Companies Have Target Debt Ratios?

This table presents survey responses to the following question about target debt ratios: *Does your firm have a target for how much debt to use? (No Target/Range, Flexible Target/Range, Somewhat Tight Target/Range, Strict Target/Range)*. The percentage of CFOs that provide a given answer is shown in the bottom four rows. In the conditional analysis, large (small) firms have revenue greater (less) than \$1 billion. Panel A compares results from the Graham and Harvey (2001) survey to results from the 2022 Duke CFO Survey (March 2019 wave). For each pair of columns, a Pearson's chi-squared test for differences in proportions (reflected in the bottom four rows) is performed. For example, in columns (1) and (2) of Panel A, the frequency of firms in each target debt range is compared and tested across the full samples in the 2001 and 2022 surveys. Panel B uses data solely from the 2022 Duke CFO Survey and displays comparisons conditional on company characteristics (e.g., public and private firms are compared in columns (3) and (4)). In both panels, the row "Score" gives the average score and the significance from the comparison of proportions. The values used in each score are 0 = No Target, 1 = Flexible, 2 = Somewhat Tight, 3 = Strict. Definitions of demographic variables are given in Appendix Table A.I. *, **, and *** display significance at 10%, 5%, and 1% level, respectively.

Panel A: Target Debt Ratios, 2001 vs. 2022 Comparison							
	Full Sample		Large Firms		Small Firms		
	2001 (1)	2022 (2)	2001 (3)	2022 (4)	2001 (5)	2022 (6)	
N	361	385	148	111	213	274	
Score	1.62	1.33***	1.57	1.66	1.66	1.20***	
No Target (%)	9.70	27.53	10.14	9.01	9.39	35.04	
Flexible (%)	37.12	27.27	33.78	30.63	39.44	25.91	
Somewhat Tight (%)	34.35	29.87	45.27	45.95	26.76	23.36	
Strict (%)	18.84	15.32	10.81	14.41	24.41	15.69	

(Continued)

Table V—Continued

Panel B: Target Debt Ratios, Conditional on Company Characteristics														
	Size		Public		Growth Prospects		Pay Dividends		Leverage		Cash		Financial Flexibility	
	Small (1)	Large (2)	No (3)	Yes (4)	No (5)	Yes (6)	No (7)	Yes (8)	Low (9)	High (10)	Low (11)	High (12)	No (13)	Yes (14)
N	274	111	262	123	166	164	268	117	188	169	186	130	44	341
Score	1.20	1.66***	1.22	1.57***	1.29	1.32	1.25	1.50***	1.16	1.56***	1.53	1.10***	1.14	1.35***
No Target (%)	35.04	9.01	34.73	12.20	28.92	26.22	32.09	17.09	34.04	18.34	18.28	36.15	47.73	24.93
Flexible (%)	25.91	30.63	25.95	30.08	27.11	28.05	27.99	25.64	27.13	26.63	27.96	27.69	18.18	28.45
Somewhat Tight (%)	23.36	45.95	22.14	46.34	30.12	32.93	22.39	47.01	27.13	36.09	36.02	26.15	6.82	32.84
Strict (%)	15.69	14.41	17.18	11.38	13.86	12.80	17.54	10.26	11.70	18.93	17.74	10.00	27.27	13.78

highlights that large, public, dividend-paying, low cash firms say that they are more likely to set leverage bounds.

In March 2020, 10% (12%) of firms said that by year-end 2019, they had reached their ex ante upper- (lower-) limit debt ratio. Interestingly, only 16% of these firms⁴³ had taken action to push their debt ratios back toward optimal, suggesting that the effective range of acceptable debt may be wider than shown in the figure. Common explanations for this lack of action are that firms thought their debt ratio would self-correct in the near term and/or they changed the width of their acceptable range during 2019. This flexible rebalancing, as well as the general importance of financial flexibility as described below, is consistent with research by Harry DeAngelo and others arguing that companies intentionally deviate from traditional debt targets by issuing transitory debt that allows them to achieve objectives such as funding investment. This literature would argue that the targeting behavior described above is secondary to the use of transitory debt to invest.⁴⁴

Evidence in Section VII of the [Internet Appendix](#) further shows that over the most recent decade, firms changed their target debt ratios infrequently: roughly 60% of companies indicate that they changed their target debt ratio at most one time during the 2009 to 2018 period. This stability is consistent with debt ratio persistence documented by Lemmon, Roberts, and Zender (2008) (although DeAngelo and Roll (2015) provide evidence of increased debt ratio variation, and hence less stability, over longer horizons). While it is hard to know the appropriate amount of target variation, the stickiness over the last decade is notable given the changes in economic and financial market conditions (deep recession, initially slow but eventually strong recovery, changes in the tax code, low interest rates, etc.). An open-ended question on the survey asked CFOs why they changed their target when they last did so (see Table [IA.X](#)). CFOs indicate that target debt ratios change for operational (e.g., investment, M&A) and liquidity reasons, with restructuring designed to reoptimize the debt ratio less a concern.

Following Graham and Harvey (2001), the survey also asks CFOs about the determinants of their debt policy choices. Results are shown in Figure 16. Perhaps the most striking observation from the figure is the overall persistence (i.e., stickiness) of the importance of many factors:⁴⁵ most of the factors are of similar magnitude and relative rank in the two surveys, notwithstanding the dramatic changes in the economy. One interesting exception is the

⁴³ This subgroup consists of only 19 firms, so these findings should be interpreted with caution.

⁴⁴ See DeAngelo and DeAngelo (2006), DeAngelo, DeAngelo, and Whited (2011), DeAngelo, Gonçalves, and Stulz (2018), DeAngelo (2021), and cites therein.

⁴⁵ Discussions with CFOs indicate that for a factor to be considered important, the factor must be part of the decision process the company uses and its effect must be of sufficiently large magnitude. For example, the reduction in the importance of the interest tax savings factor likely reflects a reduction in the magnitude of the statutory tax rate rather than a change in the importance of taxes generally. For variables that received relatively similar rankings, the combination of importance in the decision process and magnitude of effect can be interpreted as relatively similar today to 20 years ago.

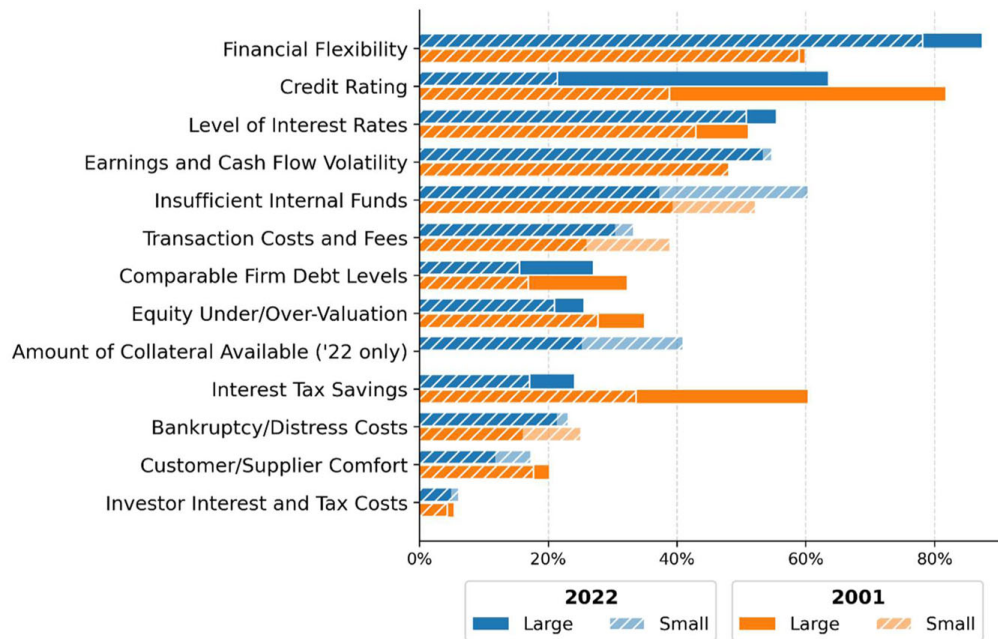


Figure 16. Which factors drive debt decisions? This figure displays CFO responses to the following question: *Which of the following factors affect how your firm chooses the appropriate amount of debt for your firm?* (0 = Not Important, 1, 2 = Moderate Importance, 3, 4 = Very Important). The percentage of firms that answer “3” or “4” is shown. Blue (top) bars display results for the 2022 Duke CFO survey (March 2019 wave); orange (bottom) bars display results from Graham and Harvey (2001). Within each blue and orange bar, the solid portion displays responses for large firms (revenue above \$1 billion), and the crosshatched portion displays responses for small firms (revenue below \$1 billion). For example, 87% of large firms (78% of small firms) in 2022 regard maintaining financial flexibility as an important or very important factor affecting debt decisions. The 2022 credit rating number in the figure (i.e., 63.5% for large firms) is for firms that indicated that they had a credit rating on the survey. For the firms that I can confirm have a Standard & Poor’s credit rating, the percentage that listed credit rating as important or very important is 71.9% for the full sample. (Color figure can be viewed at wileyonlinelibrary.com)

importance of interest tax deductibility: 60% of large firms indicated that interest deductibility was an important or very important debt factor in 2001, compared to only 24% in the recent survey. This reduction in importance is intuitive given the reduction in U.S. federal corporate income tax rates (from a top rate of 35% in 2001 to 21% in 2018), very low interest rates, and hence low interest deductions, as well as new restrictions on interest deductibility. This result is consistent with stability of the decision process together with a change in the magnitude of the tax factor. Given that the importance of tax deductions changed in the expected direction, this result also highlights the stability of the other factors: the similar ranking of nontax factors appears to reflect substantial inertia in managerial decision processes (though one cannot say whether these decision processes reflect precise optimization or learned adaptations).

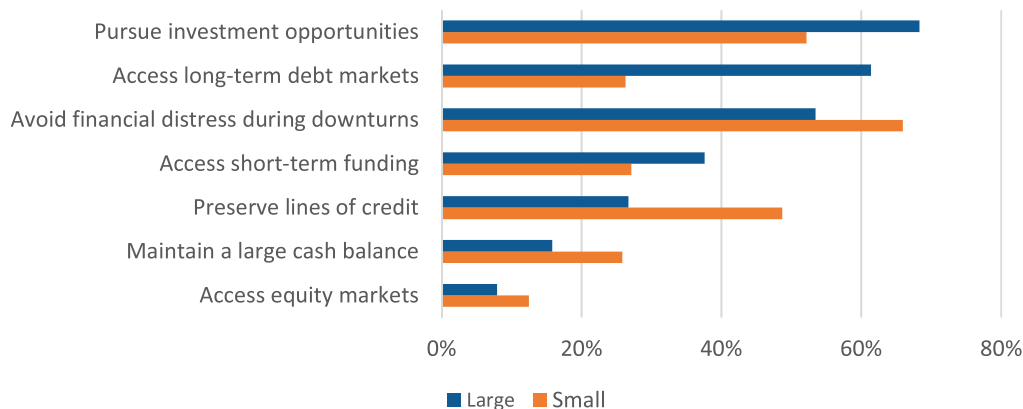


Figure 17. Why is maintaining financial flexibility important? This figure displays the 2022 CFO responses to the following question: *Why is it important for your firm to maintain financial flexibility? (choose up to three)* This question was only asked of firms that indicated that financial flexibility was at least moderately important (answered “2,” “3,” or “4”) in Figure 16). Large (small) firms are those with sales revenue greater (less) than \$1 billion. Blue (top) bars display responses from large firms; orange (bottom) bars display responses for small firms. For example, two-thirds of small firms indicate that financial flexibility is important to help avoid financial distress. (Color figure can be viewed at wileyonlinelibrary.com)

Figure 16 also shows that the desire to preserve financial flexibility is the most popular factor, notably more so in 2022 than two decades prior.⁴⁶ The importance of flexibility makes sense in the context of short planning horizons and internal forecasts with miscalibrated left tails. Future research should consider what drives the (increasing) importance of flexibility. Possibilities include the shift toward a more service and tech-based economy, the increased role of product customization, the growing importance of intangible assets, and increased asset specificity (i.e., reduction in redeployability).

Many of the debt factors seem consistent with a trade-off theory (earnings volatility, transaction costs, collateral, tax savings), while other factors align with a pecking-order theory (preference for flexibility, undervaluation of public companies, insufficient internal funds of private companies; see Table VII). Given that managers consider decreasing potential costs of distress as a primary benefit of financial flexibility (see Figure 17) and treat earnings/cash flow volatility as a primary debt factor (see Figure 16), companies appear to view financial distress as an important deterrent to debt usage. This result runs counter to some studies in the literature,⁴⁷ and could indicate

⁴⁶ Using Compustat data, DeAngelo, Gonçalves, and Stulz (2018) show that after hitting a peak debt ratio, the median firm reduces its debt ratio to a near-zero trough in fewer than seven years, consistent with these firms increasing financial flexibility. See also Bolton, Wang, and Yang (2021), who model the importance of financial flexibility.

⁴⁷ Miller (1977) famously used the phrase “horse and rabbit stew” to describe the large “horse” tax benefits of debt associated with the 48% corporate income tax rate in the mid-1970s, versus the small “rabbit” expected costs of financial distress. As Miller (1991) puts it, “neither empirical research nor simple common sense could convincingly sustain these presumed costs of bankruptcy as a sufficient, or even as a major reason for the failure of so many large, well-managed US cor-

Table VII
Which Factors Drive Debt Decisions?

This table presents survey responses to the following question about key debt factors: *Which of the following factors affect how your firm chooses the appropriate amount of debt for your firm?* (0 = *Not Important*, 1, 2 = *Moderate Importance*, 3, 4 = *Very Important*). Panel A compares results from the Graham and Harvey (2001) survey to results from the 2022 Duke CFO Survey (March 2019 wave). Columns (1) and (2) display the percentage of large firms that regard the given factor as important or very important (i.e., they answered a score of “3” or “4” to the question above). For example, 87.38% of large firms in the 2022 survey regard maintaining financial flexibility as an important or very important factor that affects their debt decisions. Columns (3) and (4) display the same for small firms. Large (small) firms are firms with revenue greater (less) than \$1 billion. No statistical tests are performed in columns (1) to (4). Columns (5) and (6) display the average score (on a 0 to 4 scale) for each factor in the 2001 and 2022 surveys, respectively. Columns (7) to (10) display analogous information for large and small firms. For each pair of columns and each technique, a comparison of means (*t*-test) is performed (e.g., in columns (5) and (6), the mean scores for each factor are compared across the full samples in the 2001 and 2022 surveys). Panel B uses data solely from the 2022 Duke CFO Survey (March 2019 wave) and displays comparisons of the frequency of use of each factor across different company characteristics (e.g., small and large firms are compared in columns (1) and (2)). Definitions of debt factors and demographic variables are given in Appendix Table A.I. *, **, and *** display significance at 10%, 5%, and 1% level, respectively.

Panel A: Key Debt Factors, 2001 vs. 2022 Comparison										
	Percent Important or Very Important						Score			
	Large Firms		Small Firms		Full Sample		Large Firms		Small Firms	
	2001 (1)	2022 (2)	2001 (3)	2022 (4)	2001 (5)	2022 (6)	2001 (7)	2022 (8)	2001 (9)	2022 (10)
<i>N</i>	156	107	211	262	367	369	156	107	211	262
Financial Flexibility	59.87	87.38	59.02	78.17	2.59	3.20***	2.65	3.47***	2.54	3.09***
Credit Rating	81.70	63.46	38.83	21.43	2.46	1.73***	3.14	2.82*	1.95	1.28***
Level of Interest Rates	50.99	55.34	42.93	50.80	2.22	2.47**	2.40	2.53	2.08	2.44**
Earnings and Cash Flow Volatility	48.05	53.33	48.10	54.76	2.32	2.50*	2.36	2.49	2.28	2.50*
Insufficient Internal Funds	39.33	37.25	52.17	60.40	2.13	2.34*	1.88	1.80	2.31	2.55
Transaction Costs and Fees	26.00	30.39	38.94	33.33	1.95	1.89	1.81	1.75	2.05	1.95

(Continued)

Table VII—Continued
Panel A: Key Debt Factors, 2001 vs. 2022 Comparison

	Percent Important or Very Important				Score					
	Large Firms		Small Firms		Full Sample		Large Firms		Small Firms	
	2001 (1)	2022 (2)	2001 (3)	2022 (4)	2001 (5)	2022 (6)	2001 (7)	2022 (8)	2001 (9)	2022 (10)
Comparable Firm Debt Levels	32.24	26.92	16.91	15.54	1.49	1.24**	1.77	1.70	1.29	1.05*
Equity Under/Over-Valuation	34.87	25.49	27.72	20.99	1.56	1.48	1.76	1.58	1.41	1.44
Amount of Collateral Available ('22 only)		25.24		40.94		1.85		1.30		2.07
Interest Tax Savings	60.26	24.04	33.65	17.13	2.07	1.30***	2.44	1.62***	1.80	1.16***
Bankruptcy/Distress Costs	16.11	21.36	25.12	23.11	1.24	1.25	1.10	1.21	1.33	1.27
Customer/Supplier Concerns	20.13	11.76	17.70	17.36	1.24	1.17	1.30	1.15	1.21	1.18
Investor Interest and Tax Costs	5.33	4.95	4.39	6.10	0.68	0.64	0.72	0.49*	0.64	0.70

(Continued)

Table VII—Continued
Panel B: Key Debt Factors, Conditional on Company Characteristics

	Size		Public		Growth Prospects		Pay Dividends		Leverage		Cash		Financial Flexibility	
	Small	Large	No	Yes	No	Yes	No	Yes	Low	High	Low	High	No	Yes
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
N	262	107	252	117	163	156	253	116	184	167	183	128	41	328
Financial Flexibility	3.09	3.47***	3.09	3.44***	3.22	3.14	3.12	3.38*	3.26	3.12	3.19	3.23	3.08	3.22
Credit Rating	1.28	2.82***	1.27	2.73***	1.80	1.59	1.55	2.12***	1.55	1.92*	1.85	1.46*	1.59	1.75
Level of Interest Rates	2.44	2.53	2.46	2.48	2.39	2.54	2.40	2.61	2.42	2.50	2.42	2.54	2.08	2.52*
Earnings and Cash Flow Volatility	2.50	2.49	2.43	2.63	2.54	2.43	2.49	2.51	2.45	2.60	2.46	2.51	2.77	2.46
Insufficient Internal Funds	2.55	1.80***	2.58	1.80***	2.50	2.16*	2.55	1.89***	2.37	2.31	2.30	2.43	3.30	2.21***
Transaction Costs and Fees	1.95	1.75	1.96	1.73	1.99	1.84	1.91	1.84	2.03	1.73*	1.77	2.02	1.92	1.89
Comparable Firm Debt Levels	1.05	1.70***	0.97	1.82***	1.25	1.19	1.19	1.35	1.11	1.35	1.31	1.03*	1.18	1.25
Equity Under-/Overvaluation	1.44	1.58	1.27	1.91***	1.39	1.58	1.48	1.48	1.28	1.69**	1.44	1.49	1.34	1.50
Amount of Collateral Available	2.07	1.30***	2.09	1.35***	1.89	1.77	2.05	1.43***	1.80	1.93	1.98	1.75	2.30	1.79*
Interest Tax Savings	1.16	1.62**	1.14	1.63***	1.18	1.32	1.27	1.35	1.26	1.27	1.26	1.27	0.82	1.35*
Bankruptcy/Distress Costs	1.27	1.21	1.24	1.29	1.32	1.14	1.27	1.22	1.19	1.32	1.32	1.28	1.71	1.20*
Customer/Supplier Concerns	1.18	1.15	1.13	1.25	1.32	1.11	1.22	1.06	1.02	1.32*	1.13	1.15	1.59	1.12*
Investor Interest and Tax Costs	0.70	0.49	0.65	0.61	0.73	0.56	0.63	0.64	0.61	0.61	0.59	0.63	0.45	0.66

conservatism driven by managerial self-interest (e.g., risk-averse managers choosing conservative corporate actions). Many businesses seem to act as if they face an objective function that has a flat region near optimality for which the penalty for being too aggressive is much worse than the penalty for being too conservative.⁴⁸ Such an objective function may reflect downside miscalibration in corporate forecasts and/or managers' job security concerns.

Section II suggests that corporate investment is not sensitive to the interest rate. In Figure 16, it is therefore notable that interest rates are an important debt factor. This result suggests that CFOs try to time the market, which is difficult to reconcile with standard theory. Internet Appendix Table IA.XII summarizes what CFOs say they mean when they indicate that they issue debt when interest rates are low (e.g., cost of debt is cheap, ability to service debt improves). Graham and Harvey (2001) also find evidence of attempts to market-time debt maturity and foreign debt issuance. Future research should investigate the contrast between CFOs indicating that debt issuance is interest rate sensitive while investment hurdle rates are not, given the common view that investment and capital structure are closely related.

Panel A of Table VII reports that 25% of large firms say that having sufficient collateral to secure debt is an important debt factor. The overall moderate importance of collateral is consistent with the downward trend in secured debt use documented by Benmelech, Kumar, and Rajan (2020). These authors argue that firms more likely to face distress or financial constraints are more likely to secure debt (see also Rampini and Viswanathan (2010) and Ma, Tong, and Wang (2021)). Consistent with this view, I find that small firms and firms lacking financial flexibility are significantly more likely to note that collateral is an important determinant of debt policy (Panel B).

As discussed above, approximately 80% of companies consider preserving financial flexibility as a primary determinant of corporate debt policy. In response to a separate question asking why maintaining financial flexibility is important, large firms indicate that preserving the ability to pursue investment opportunities is most important (Figure 17), suggesting that for these firms, the benefit of being able to invest outweighs many traditional costs and benefits of debt, while small, private firms list avoiding distress as the most important reason to maintain financial flexibility (Table VIII), underscoring an important role of debt conservatism for such firms. Internet Appendix

porations to pick up what seemed to be billions upon billions of dollars of potential tax subsidies." This thinking, of course, abstracts from indirect costs of debt, such as the benefit of preserving debt capacity for future opportunities. Interestingly, in the current survey, distress costs appear to be more important than tax factors, and thus, we may have rabbit and horse stew in the current (low-tax) environment. More recent research focusing on distress costs includes Berk, Stanton, and Zechner (2010) and Almeida and Philippon (2008), who argue that the costs of distress may be higher than estimated in previous academic studies (the latter paper focuses on measurement, while the former focuses on labor costs as a missing and hard-to-measure component of distress costs). See also Elkamhi, Ericsson, and Parsons (2012), Graham, Kim, Li, and Qiu (2021), and Ivanov, Pettit, and Whited (2021).

⁴⁸ Binsbergen, Graham, and Yang (2010) derive such an objective function (see their figure 10; see also Korteweg (2010)).

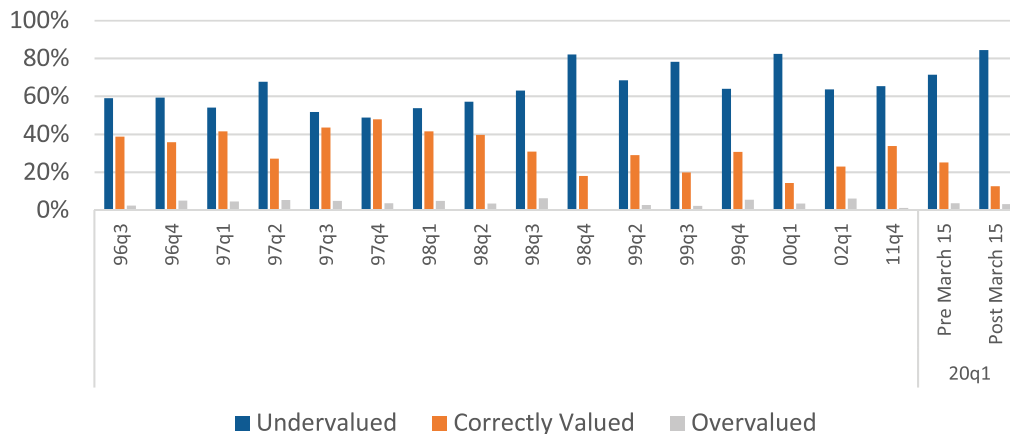


Figure 18. Is your stock correctly valued? (1990s, 2000, 2002, 2011, 2020). This figure displays CFO responses to the following question: *Is your stock correctly valued?* Blue (left) bars display the percentage of CFOs who believe that their firm's common stock is undervalued. Orange (middle) bars display results for CFOs who believe that their stock is correctly valued. Gray (right) bars display results for CFOs who believe that their stock is overvalued. The historic data are from the Duke Global Business Outlook survey. 20Q1 data are from the March 2020 wave of the 2022 survey. For example, among CFOs who responded after March 15, 2020, 83% think that their stocks are undervalued. (Color figure can be viewed at wileyonlinelibrary.com)

Table [IA.XI](#) provides evidence of self-attribution bias when firms evaluate the relative contribution of the market versus own-firm actions in determining their degree of financial flexibility.

B. Equity Issuance and Valuation

The survey also investigates equity issuance decisions. The 2022 findings (not in a table) are similar to those in Graham and Harvey (2001) and thus again consistent with sticky decision processes. In both 2022 and 2001, issuance decisions are affected by perceived own-firm equity valuation, concern about earnings per share (EPS) dilution, and issuing equity as part of employee compensation. One factor more important today than 20 years ago is balancing capital structure via equity issuance.

Given the importance of equity valuation to equity issuance decisions (and repurchase decisions; see Section V), it is notable that in a typical quarter, 50% to 80% of public company CFOs think that their stock is undervalued (see Figure 18). This was true in the late 1990s during the Internet Bubble, before and after the 2001 recession, and again in 2020 just before and during the COVID-19 crisis. This strong, pervasive view implies actual or perceived information asymmetry between managers and investors and is consistent with there being an incentive for firms to attempt to time the market. CFOs' excessive optimism pertains to their own firms, not the market at large: CFOs rate their ability to "time the overall market" as average but rate their ability to choose own-firm value-creating investment projects as much better than their industry peer CFOs.



Figure 19. What methods do companies use to value their own stocks? This figure displays the 2022 CFO responses to the following question: *What approach does your company use to conclude that your stock is undervalued/overvalued or that your stock price is low/high?* For example, 52% of the CFOs value their stocks according to the current stock price relative to its historic highs and lows. (Color figure can be viewed at wileyonlinelibrary.com)

Figure 19 summarizes results on how CFOs estimate their own firm's valuation. A majority of firms rely on a simple approach comparing the current price to recent highs and lows. Many firms also rely on advisors or internal models based on discounting their own cash flows or looking at comparable firms.

C. Capital Structure Takeaways

- Most companies quantify debt using ratings or flow measures, in particular debt/EBITDA.
- Firms indicate that they target debt but flexibly.
 - There is stickiness in the degree of targeting pursued.
 - For firms that target, over moderate time horizons, they rarely change the target itself and if they find themselves off target, they move slowly back toward the target.
- Factors driving debt decisions are sticky (i.e., similar rankings in 2001 and 2022).
- Financial flexibility is regarded as important to allow for investment and to help avoid distress (consistent with not fully anticipating left-tail outcomes and/or large costs of distress).
 - When flexibility changes, executives take credit for improvements but blame markets for deterioration (see Internet Appendix Table IA.XI).
- There is evidence of market timing (issue debt when interest rates low; issue equity when valuation is perceived to be high).
- Companies commonly think that their stock is undervalued, even during market booms.
- Simple rules like recent highs are used to determine own-firm common stock valuation.⁴⁹

⁴⁹ Future equity issuance research could explore why firms act as if equity is more costly than debt on a risk-adjusted basis (is it tied to adverse selection?), why firms view equity issuance as dilutive if the funds are used to create value, and why firms appear to care more about existing/continuing equityholders than, for example, equityholders that sell into a repurchase program.

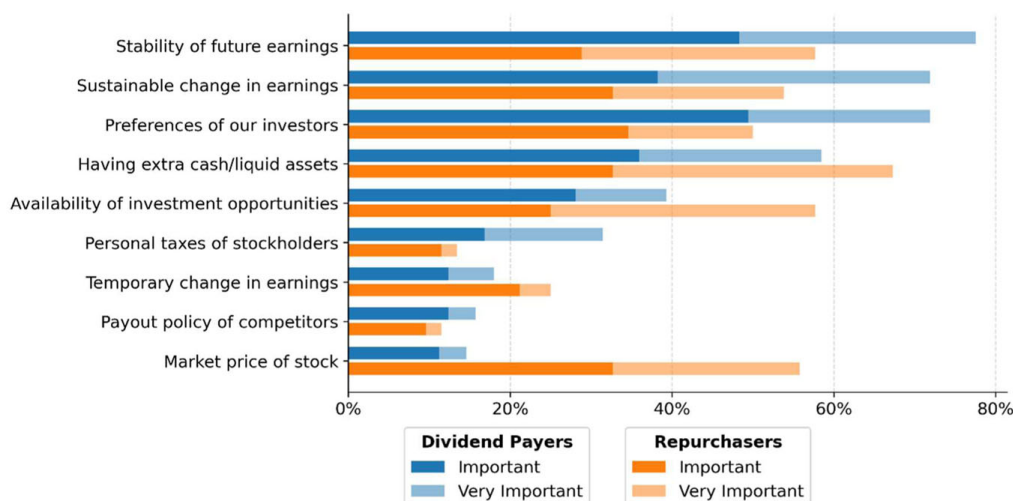


Figure 20. Factors driving payout decisions. This figure displays the 2022 CFO responses (March 2020 wave) to the following question: *How important are the following factors to your company's dividend/repurchases decisions?* {0 = Not important at all, 1 = Somewhat Unimportant, 2, 3 = Important, 4 = Very Important}. The graph displays the percentage of CFOs that answered "3" or "4," and the sample is conditional on the firm paying dividends (top, blue) or repurchasing shares (bottom, orange); a firm can be included as both a dividend payer and a repurchaser. For example, 48% (29%) of dividend payers indicate that the stability of future earnings is important (very important) to dividend decisions (thus, approximately 78% of dividend payers consider stability of future earnings to be important or very important). (Color figure can be viewed at wileyonlinelibrary.com)

- Internet Appendix Figure [IA.6](#) shows that funding sources are not viewed as interchangeable in terms of planned use of funds, that is, different sources of funds are associated with different real outcomes.
- Internet Appendix Figure [IA.5](#) shows that debt overhang leads to agency costs such as passing up NPV > 0 projects and cutting corners.
- Section VII of the [Internet Appendix](#) contains additional information about how often companies change debt targets and the factors that affect changes in targets, correlations between debt/EBITDA and other common debt ratios, how the interest rate affects capital structure policy, as well as the role of debt maturity and fixed versus floating rate debt.

V. Payout Policy

In this section, I turn to survey evidence on corporate payout policy, connect payout policy to the common themes of corporate finance, and explore the relation between payout and investment.

A. Evidence on Payout Policy

The evidence on payout in Figures [20](#) and [21](#), Table [IX](#), and Section VIII of the [Internet Appendix](#) is in line with three common themes

Table IX
Payout

This table presents CFO views on capital allocation and payout decisions. Panel A displays the importance of various factors that drive payout decisions, in the context of the following question: *How important are the following factors to your company's dividend/repurchase decisions?* (0 = *Not Important at All*, 1 = *Somewhat Unimportant*, 2, 3 = *Important*, 4 = *Very Important*). Data are from the 2022 CFO Survey (March 2020 wave). The “Div.” (“Rep.”) column shows responses for the subset of firms that pay dividends (repurchase shares); a firm can be in both groups. Columns (1) and (2) of Panel A display the percentage of CFOs that answered “3” or “4.” For example, 77.5% of dividend payers state that the stability of future earnings is important or very important to dividend decisions. Panel B displays responses to the following question: *Please indicate the priority of the following items as your firm allocates capital.* (1 = *Not important*; 2 = *Like to do but only moderately important*; 3 = *Important, do if possible*; 4 = *Top priority*). The percentage of firms that answer “Important, do if possible” or “Top priority” are shown in columns (1) and (2); the other columns present the mean scores based on a 1-to-4 scale for the four choices. For example, 77.3% of dividend-paying firms say that maintaining historic levels of dividends is important or a top priority. Public firms are listed on a stock exchange and large firms have sales revenue of at least \$1 billion. For each pair of columns, a comparison of means (*t*-test) is performed. No statistical tests are performed in columns (1) and (2). Definitions of demographic variables are given in Appendix Table A.I. *, **, and *** display significance at 10%, 5%, and 1% level, respectively.

Panel A: Important Factors Driving Payout Decisions											
Percent Important or Very Important			Subsample Comparisons								
			All Firms			Public Firms			Large Firms		
	Rep. (1)	Div. (2)	Rep. (3)	Div. (4)	Rep. (5)	Div. (6)	Rep. (7)	Div. (8)	Rep. (9)	Div. (10)	
<i>N</i>	52	89	52	89	32	33	25	33	27	56	
Stability of future earnings	57.69	77.53	2.46	3.06**	2.57	3.13	2.57	3.09	2.37	3.04*	
Preferences of our investors	50.00	71.91	2.33	2.87**	2.45	2.61	2.71	2.81	2.00	2.91***	

(Continued)

Table IX—Continued

Panel A: Important Factors Driving Payout Decisions											
	Percent Important or Very Important		Subsample Comparisons								
	All Firms		All Firms		Public Firms		Large Firms		Small Firms		
	Rep. (1)	Div. (2)	Rep. (3)	Div. (4)	Rep. (5)	Div. (6)	Rep. (7)	Div. (8)	Rep. (9)	Div. (10)	
Sustainable change in earnings	53.85	71.91	2.24	2.95**	2.32	3.00*	2.29	2.75	2.19	3.08**	
Having extra cash/liquid assets	67.31	58.43	2.76	2.55	3.03	1.97**	3.17	2.00***	2.38	2.87	
Availability of investment opportunities	57.69	39.33	2.53	2.19	3.03	2.20*	3.25	2.16**	1.89	2.21	
Personal taxes of stockholders	13.46	31.46	0.94	1.66**	0.74	0.74	0.62	0.78	1.22	2.19**	
Temporary change in earnings	25.00	17.98	1.33	1.41	1.45	0.97	1.42	1.00	1.26	1.67	
Payout policy of competitors	11.54	15.73	0.98	0.99	1.39	1.84	1.33	1.56	0.67	0.64	
Market price of stock	55.77	14.61	2.48	1.01***	3.07	1.68***	3.12	1.53***	1.88	0.70***	

(Continued)

Table IX—Continued

Panel B: How Do Companies Prioritize Capital Allocation of Funds?										
Percent Important or Top Priority			Subsample Comparisons							
All Firms			All Firms		Public Firms		Large Firms		Small Firms	
Rep. (1)	Div. (2)		Rep. (3)	Div. (4)	Rep. (5)	Div. (6)	Rep. (7)	Div. (8)	Rep. (9)	Div. (10)
N	60	128	60	128	39	49	30	46	30	82
Maintain historic levels of dividends	56.67	77.34	2.82	3.28**	3.21	3.46	3.38	3.48	2.24	3.18***
Fund existing capital spending	78.33	77.34	3.32	3.22	3.55	3.53	3.72	3.67	2.89	2.96
Fund new capital spending	80.00	75.00	3.32	3.07	3.41	3.30	3.41	3.33	3.22	2.92
Increase dividend per share	46.67	60.16	2.30	2.71*	2.53	2.72	2.59	2.70	2.00	2.72***
Pay down debt	53.33	57.03	2.68	2.74	2.53	2.63	2.57	2.67	2.80	2.78
Increase cash holdings	41.67	47.66	2.43	2.46	2.38	2.09	2.22	2.07	2.63	2.67
Fund R&D	51.67	46.88	2.75	2.51	2.97	2.72	3.07	2.85	2.40	2.32
Acquisitions	58.33	32.81	2.80	2.22***	2.92	2.58	2.82	2.42	2.79	2.10***
Repurchasing shares	73.33	24.22	2.91	1.85***	3.03	2.40**	3.07	2.35***	2.75	1.53***

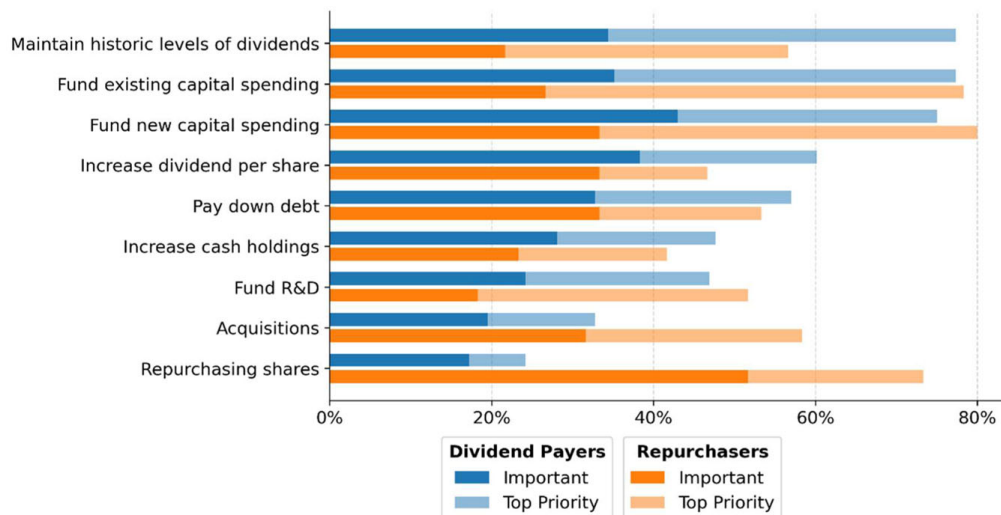


Figure 21. How do companies prioritize capital allocation of funds? This figure displays the 2022 CFO (March 2020 wave) responses to the following question: *Please indicate the priority of the following items as your firm allocates capital. [not important; like to do but only moderately important; important, do if possible; top priority; not applicable].* The percentage of firms that answer “Important, do if possible” or “Top priority” is shown. The results are divided into two nonmutually exclusive groups (i.e., a firm can be in both groups): firms that pay dividends (“Dividend Payers”), displayed in the top blue bars and those that repurchase shares (“Repurchasers”), displayed in the bottom orange bars. For example, 77% of dividend-paying firms say that maintaining historic levels of dividends is important or very important. (Color figure can be viewed at wileyonlinelibrary.com)

in corporate finance discussed above: inertia, conservatism, and market timing.

First, Figure 20 summarizes survey results on the factors that influence corporate payout decisions. Comparing the results with Brav et al. (2005) and Lintner (1956) points to persistence or stickiness in the factors that drive dividend and repurchase decisions.⁵⁰ This is notable given dramatic changes in firm type (e.g., manufacturing versus service), market scope, etc., in recent decades. Amidst this economic change, mature firms with stable profits are those most likely to pay out profits to shareholders (Figure 20).

Since Lintner (1956), we have known that U.S. companies are reluctant to reduce dividends, as doing so is associated with a negative market reaction (Internet Appendix Figure IA.9). Accordingly, in line with a second common theme in corporate finance, the survey results suggest that firms exhibit conservatism and smooth dividend increases. This conservative approach to dividend increases is intuitive given a context of reliable planning at only short horizons and firms underestimating the left tail of their earnings

⁵⁰ As additional evidence of payout process stability, Section VIII of the [Internet Appendix](#) shows that the simple Lintner (1956) model of increasing payout at a smooth rate toward a target payout ratio still works well in explaining dividends. The stability in what drives payout is also evident in Kahle and Stulz’s (2021) finding that models estimated on firm characteristics using pre-2000 data explain much of the change in payout post-2000.

distributions. Left-tail surprises also provide incentives for firms to shift payout toward repurchases, given the perceived lack of market penalty for repurchase reductions from one year to the next.

A third common theme in corporate finance, market timing, can also be seen in payout decisions. In particular, Internet Appendix Figure IA.10 shows that CFOs indicate that their firms repurchase more when buybacks are a good investment. This undervaluation logic is notable given that about two-thirds of companies believe that their shares are undervalued at any point in time (see Figure 18). CFOs also say that they repurchase with the objective of increasing EPS, a view also common among bankers and the popular press, although academics note that this action may not increase firm value due to the increased equity risk (and cost of equity) associated with leveraging up via repurchases (Oded and Michel (2008)). CFOs further cite repurchases as a tool to offset stock compensation.

B. Evidence on the Tension between Payout and Investment

The survey dedicates several questions to exploring the tension between returning funds to shareholders via payout on the one hand and using the funds to invest on the other hand. In particular, the survey explores whether a commitment to maintain historic levels of dividends (or repurchases) crowds out corporate investment.⁵¹ Brav et al. (2005) provide survey evidence, indicating that maintaining the existing level of dividend payments may be as important as funding corporate investment.

The current survey uses a three-prong approach to study how firms balance investment versus payout. (i) In response to a direct survey question, 45% (58%) of CFOs indicate that they choose their investment policy *before* choosing their dividend (repurchase) policy (Internet Appendix Figure IA.9). (ii) In response to a question that asks CFOs whether they would reduce payout to fund an attractive investment, and if so, what after-tax ROIC the new investment project would have to earn to justify such a change, 61% (23%) indicate that they would not reduce dividend payments (repurchases) to invest regardless of the return on the alternative project. Among the 39% (77%) who would consider cutting dividends (reducing repurchases) to fund investment in a new project, the required after-tax ROIC on the investment would need to be at least 19% (18%).

Three, the survey also asked CFOs how they prioritize the allocation of capital within their firms across investment, paying dividends, paying down debt, etc. Figure 21 summarizes the results. Among dividend-paying firms (blue (top) bars), maintaining the historic level of dividends is on par with funding existing or new capital investment and is more important than paying down debt or

⁵¹ Miller and Rock (1985) and Bhattacharya (1979) argue that high-quality firms can use payout and the forgone investment to signal their type. With the caveat that signaling is difficult to explore using surveys, Brav et al. (2005) find little support among practitioners for the signaling hypothesis. Ham, Kaplan, and Leary (2020) find evidence of signaling over short horizons.

funding R&D.⁵² Among firms that repurchase shares (orange (bottom) bars), buybacks are an important use of capital though not quite as important as funding investment.

Across these three questions on the tension between payout and investment, CFOs view maintaining dividend payments as of similar importance as investing in profitable investment projects. According to CFOs, repurchases are somewhat less likely to crowd out investment than are dividends. These relative priorities should be taken into account in corporate finance research and policy, for example, in examining the efficacy of a recent Biden Administration proposal to tax repurchases to discourage share buybacks in an attempt to encourage corporate investment.

C. Payout Takeaways

- The processes driving dividend decisions display stickiness over the last two decades (or more).
- The quantity of dividends displays stickiness and conservatism, and repurchases reflect attempts to time the market.
- Dividend inertia affects corporate investment: CFOs say that maintaining existing dividends is as important as corporate investment, with increasing dividends not far behind.
- Repurchases also compete with investment but less so. Most CFOs say that they would reduce repurchases to fund an attractive investment project.
- Section VIII of the [Internet Appendix](#) provides information about factors that affect payout decisions and estimation of the Linter partial adjustment model using data from 1950 to 2020.

VI. The Goal of the Firm

Earlier sections show that companies prioritize revenue growth, debt/EBITDA, and historic payout. In this section, I explore the important corporate objective of shareholder value maximization, the traditional goal of the firm.

Figure 22 shows that in a 2010 survey, conducted just after the Great Recession when capitalism was taking a beating in the press, CFOs indicated that their companies were run primarily for the benefit of shareholders. In particular, the average “stakeholder index” was 31 (a ranking of 100 would mean the firm focuses entirely on stakeholders other than shareholders). A decade later, CFOs have shifted toward a more balanced stakeholder/shareholder perspective, with the average stakeholder index equal to 41. This reduced focus on

⁵² For firms that neither repurchase nor pay dividends (not shown in Figure 21), their ranking of capital allocation priorities is very similar to that shown for dividend payers. The differences are that maintaining and increasing dividends are not ranked by nonpayout firms, and nonpayout firms rate “increase cash holdings” third in their capital allocation priorities.

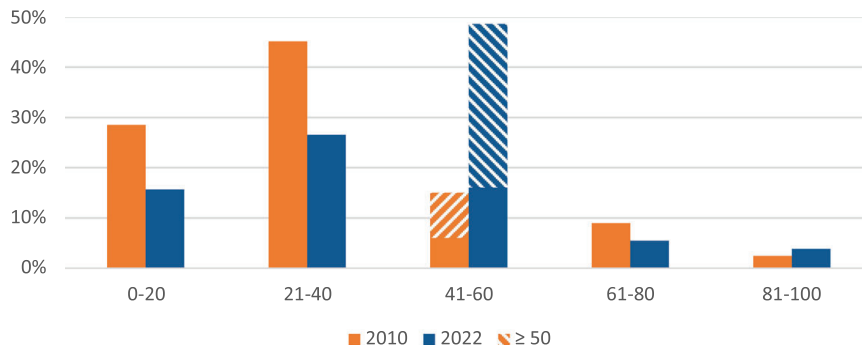


Figure 22. On whose behalf should a company be run? This figure displays CFO responses to the following question: *In whose interests do you think a company should be run?* {0 = Shareholders Only, ..., 100 = Other Stakeholders Only}. Orange (left) bars display results from a Spring 2010 Duke CFO survey; blue (right) bars display results for the 2022 survey (March 2020 wave). Within the middle bars, the crosshatched portion displays results for scores greater than or equal to 50. (Color figure can be viewed at wileyonlinelibrary.com)

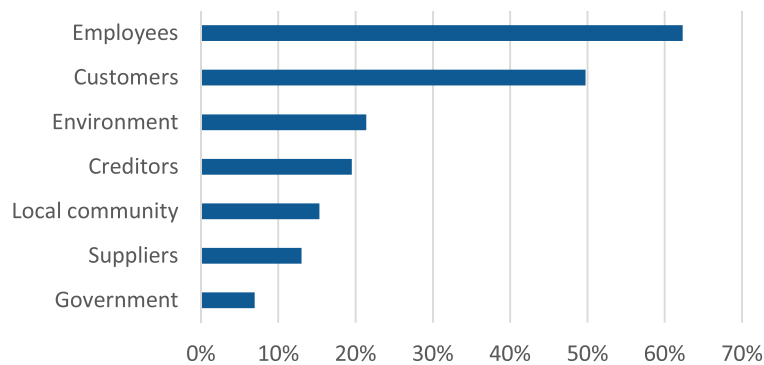


Figure 23. Which stakeholders (other than common stockholders) matter? This figure displays the 2022 CFO (March 2020 wave) responses to the following question: *Which (if any) constituents or stakeholders do you think should be ranked above shareholders?* The results are conditional on answering a score greater than or equal to 40 to the question in Figure 22: *In whose interests do you think a company should be run?* {0 = Shareholders Only, ..., 100 = Other Stakeholders Only}. (Color figure can be viewed at wileyonlinelibrary.com)

shareholder value maximization holds both across industries and around the world.⁵³

Among CFOs that give a stakeholder weight of at least 40, the 2022 survey asks which stakeholders are most important. Figure 23 shows that most firms

⁵³ About 6% of respondents are excluded from Figure 22 because they chose a 50/50 stakeholder/shareholder focus but answered a follow-up question in a manner inconsistent with such weighting. The implications do not change if these observations are included. Also, among public survey respondents, there is 33% correlation between the CFO-declared importance of stakeholders in the survey and the number of times “stakeholder” is mentioned in DEF14A letters to shareholders. See Adams, Licht, and Sagiv (2011), Hart and Zingales (2017), Fama and French (2020), Bebchuk and Tallarita (2020), Raghunandan and Rajgopal (2021), and citations therein for more research in this area.

list employees and customers as their key stakeholders. About one-in-five also list the environment and the local community.

More research is needed into this shift toward greater shareholder-stakeholder balance. Consistent with this shift in the survey data, in August 2019, the 1,000-member Conference Board announced that shareholders were only one of a half-dozen stakeholder groups on behalf of whom their firms optimize. Similar announcements were made by Blackrock and participants of the World Economic Forum, among others. Do these announcements coincide with genuine changes in the focus of public companies, or are they simply window dressing? Is focusing on stakeholders just a natural component of shareholder wealth maximization? Does stakeholder focus increase value and hence also benefit shareholders (Edmans (2020)), and have the two paradigms grown more incentive compatible?

If there has been a true shift toward greater focus on stakeholder interests, research is needed on the implications. For example, relative to shareholder-focused firms, do stakeholder-focused firms optimize from a less diversified agent's perspective? Moreover, do stakeholder firms favor labor (e.g., fewer layoffs during a recession), do they have a higher discount rate or cost of capital, and does their capital allocation differ? Additional questions include: does a stakeholder focus lead to more stability (less churn of employees and customers) that helps offset uncertainty and downside risk, how should executive compensation be tied to stakeholder focus, will enhanced technology and big data allow companies to write contracts or lead to disclosure more aligned with stakeholders, and how much shareholder value are stakeholder-focused firms willing to sacrifice to realize stakeholder objectives?

A. Goal of Firm Takeaways

- Over the last decade, there has been a shift toward greater stakeholder focus, though maximizing shareholder value is still the primary goal of the firm. Future research should explore whether there is corroborating evidence of a recent shift toward stakeholder interests, and if so, how this shift affects corporate decision-making.
- Employees and customers are the stakeholders that receive the most focus, followed by the environment and the local community. Future research should examine whether this expanded focus enhances or works against shareholder value.

VII. Summary and Implications for Future Research

In this section, I summarize the findings of the paper and explore avenues for future research. The summary presents key findings within the following broad trichotomization of corporate decision-making: (i) internal expectations and scenario planning, (ii) the objects that firms optimize, and (iii) the unifying themes of the corporate decision-making process.

Focusing first on a firm's internal forecasts and scenario plans, I show that in the creation of budgets, internal cash flow forecasts and scenarios, CFOs indicate that information used for decision-making purposes has a reliability horizon of approximately two years. Revenue forecasts are paramount in the planning process and the evidence suggests that these forecasts tend to be miscalibrated (see also Ben-David, Graham, and Harvey (2013) and Barrero (2022)). The short reliability horizon and miscalibration likely affect other corporate decisions, as discussed above. CFOs also say that corporate plans include a detailed base case and typically also include (less detailed) downside and upside scenarios. When plans are not realized *ex post* (i.e., forecast errors); for example, due to the arrival of shocks, companies adjust their future plans. In the data I examine, second moments appear to be adjusted more than first moments. Notably, Boutros et al. (2021) indicate that companies adjust enough to reduce but not eliminate miscalibration in CFO forecasts.

My analyses of internal forecasts and scenario plans are only initial steps. More research is needed to understand which economic factors drive corporate planning, how planning affects other corporate decisions, and how realized outcomes feed back to affect future corporate plans. Moreover, research should flesh out how downside and especially upside plans affect corporate decisions and the overall economy. To better understand (i) from the first paragraph of this section, will require detailed research about the creation and uses of firms' base-case forecasts and scenario plans. At a deeper level, we need to understand how these plans filter into and affect (ii) and (iii) from the initial paragraph. Though it would be ambitious, an ideal study would obtain actual planning forecasts for a panel of firms over many years and map these plans into cash flow forecasts. For example, given that expected cash flows play an important role in corporate decision-making, these internal cash flow forecasts could then be tied to capital allocation and other decisions. Studying the feedback effect of realizations on future forecasts and plans would also be informative. Finally, research is needed into how corporate budgeting, which is difficult to change during the budget year, affects the corporate decision process. Better understanding these foundational aspects of corporate planning has the potential to enhance academic models of a broad range of corporate actions and outcomes.

Research should carefully consider the objectives that firms prioritize (item (ii) above). Research traditionally assumes that companies maximize shareholder value. The CFO surveys, however, identify a trend toward balancing shareholders' and other stakeholder objectives. More work is needed to determine the degree to which this is an authentic change and implications of such a change (see Section VI). For example, to what extent does a shift toward ESG and stakeholder objectives lead to true changes in corporate objectives, policies, and outcomes? How well do stakeholder firms compete against shareholder-focused firms? Another important question is the role of revenue growth as an objective in the corporate planning process—do companies increasingly seek to maximize sales growth instead of profits or

shareholder value or is the importance of revenues driven by the variable being an important summary statistic?

There are also important considerations related to the objectives of specific policies. For example, the survey results show that cash flows are a more important determinant of corporate investment than are discount rates, payout is at least as important as investment, and most companies focus on debt/EBITDA or credit ratings to measure leverage, rather than debt/value or debt/assets. Future research should identify when these alternative objectives and measures matter and reevaluate past conclusions when they do matter.

In terms of (iii), research should consider carefully the stylized facts and commonalities of the corporate decision-making processes and economic decision rules that companies follow as they take specific actions, as well as the motives of the people making those decisions. The preceding sections document numerous decision rules used in various settings. Looking across these rules, there is some alignment between academia and the practice of finance; however, the continuing popularity of certain rudimentary decision rules (e.g., payback) is at one level surprising.

Comparing corporate practices over time allows me to identify several unifying themes with respect to the practice of finance: many corporate decision processes (i) are based on near-term focused and (ii) miscalibrated forecasts, decision processes are generally (iii) conservative (and value flexibility),⁵⁴ (iv) sticky,⁵⁵ and (v) simple, and (vi) decision-makers often attempt to time the market.⁵⁶ As one example, corporate investment decisions are based on sticky hurdle rates that are set well above the cost of capital. Sticky hurdle rates imply that investment is interest rate insensitive, and furthermore, suggest “stable” decision-making in the face of moderate positive or negative economic changes, with lags in when economic changes lead to changes in corporate decisions. Future research should explore the stickiness of hurdle rates in an increasing interest rate environment. More broadly, future research also should explain why these themes are prevalent in corporate decision-making (e.g., do they reflect constraints on funding, time, or cognition), whether they can be adequately modeled as costly biases, and under what conditions, they approximate first-best decision-making versus change decisions in important ways.

⁵⁴ Consistent with downside risk, Bolton, Wang, and Yang (2021) incorporate left-tail risk in a dynamic valuation model with costly external financing and show that due to the firm’s aversion to costly external equity issuance, the firm prudently keeps debt/EBITDA low (see also DeAngelo, DeAngelo, and Whited (2011)). Bolton, Wang, and Yang (2021) show that concern about financial flexibility affects other financial policies (e.g., payout, equity issuance, credit risk pricing and ratings, and earnings retention) via a single budget equation that equates sources and uses of funds.

⁵⁵ Blinder (1994) presents evidence that prices are sticky: the typical firm changes a product’s price only one time per year and takes on average three months to change prices in reaction to an economic shock. Nakamura and Steinsson (2009) argue that nonsale prices have a duration of 8 to 11 months.

⁵⁶ A growing literature examines effects of managerial optimism and overconfidence (e.g., Heaton (2002), Malmendier and Tate (2005), Hackbarth (2008), Graham, Harvey, and Puri (2013), and Malmendier (2018), and cites therein.) Also, Bolton, Chen, and Wang (2013) examine the interaction between financial flexibility and market timing.

Such research might focus on the different themes separately, or might consider subsets of the themes toward improving our understanding of how they interrelate with each other and other corporate policy choices. Consider miscalibration. Rather than fixing miscalibration, do companies instead attempt to offset it by adopting conservative financial policies?⁵⁷ A number of follow-up questions arise: how does pairing miscalibration with conservative policies compare to pairing proper calibration with policies that are not conservative, how does corporate hedging affect these relations, is miscalibration too ingrained psychologically to fix, and are realistic left-tail outcomes not included in CFOs' plans because doing so might hurt how rating agencies, investors, or bosses view their performance?⁵⁸ Conservative policies are sensible if the penalty for missing on the downside is severe for the executive or the firm. Research is needed to understand why miscalibration persists, as well as the effects of miscalibration on valuation and real decisions.⁵⁹

A notable practice of finance theme is that internal plans are thought to be reliable only a couple years out, which likely affects many other corporate finance decisions. Another notable theme is stickiness or stability in real-world decision processes over time.⁶⁰ Research could address whether a rational model can produce this stability, whether conservative "slack" leads to sticky decision processes by providing managers sufficient buffer that they do not need to reoptimize frequently (e.g., Bolton, Chen, and Wang (2013),⁶¹ and whether stickiness (and lack of innovation) result from companies becoming

⁵⁷ Rather than reducing miscalibration, is it more efficient to build in slack to allow for negative surprises? A benign view of conservative slack is that rational managers are aware of the complexity of the economy and accept that tail risks cannot be precisely anticipated in likelihood or magnitude. A less benign view is that building slack to offset persistent miscalibration is due to insufficient effort (perhaps in pursuit of a quiet life) combined with weak governance and monitoring (e.g., Myers (2002)). More research is needed to determine which of these or other explanations is most plausible.

⁵⁸ Adopting policies to offset expected left-tail surprises is different from miscalibration being a behavioral bias about which CFOs and firms are unaware. Also, a possible explanation for leaving downside miscalibration unfixed could be to offset actions by managers who are otherwise too conservative; of course, being miscalibrated on the upside would reinforce the tendency to make conservative managerial decisions.

⁵⁹ As one example, Barrero (2022) uses a structural model to study the interaction between miscalibration and extrapolation in managerial beliefs. According to his model, extrapolation causes forecasts to overshoot on both the upside and the downside, leading to excessive adjustment costs that reduce firm value by 2% to 7%. Additional research could investigate how the costs imposed by managerial biases affect corporate decisions. Stulz (2008) discusses in a risk management context the difficulty in anticipating the frequency and magnitude of extreme left-tail outcomes.

⁶⁰ This inertia in decision outcomes can affect both *when* companies change policies and, conditional on making a policy change (e.g., issuing debt), *how* these changes respond to economic factors. For example, stickiness could result in current decisions being based on factors that were important in the past and/or on factors' historic values. In terms of how decisions are made, if the reliable planning horizon is short (Section III), does this encourage companies to continue doing what they have been doing if it has been working well enough? A related question is whether policies only become "unstuck" in response to a sizable shock.

⁶¹ Or might it go the opposite direction: if for some reason, firms know that they cannot respond to changes quickly, they may build in more slack.

more bureaucratic as they age (Holmstrom (1989)). Moreover, future work could shed light on whether optimality of stickiness requires both decision rules that work well and a world that has not changed much over time. The latter seems unlikely given large changes in recent decades in the types of firms and products that dominate the economy.⁶² In terms of the former, a question that arises is whether stability means that companies use near-optimal decision rules, or processes that are not necessarily optimal but that are good enough in a satisficing way, or whether managers simply continue to use approaches handed down by the previous generation. In any of these cases, how are decision process norms formed and how are they handed down to the next generation of managers?⁶³ Importantly, how is change management implemented in companies? Stickiness of decision processes raises the possibility that changes in how management decisions are conducted entails large costs and constraints. Similar questions can be explored in the context of the other themes.

A satisficing framework aligns with many elements of observed corporate decision-making. The world is complex, with substantial uncertainty and poor understanding of tail risks, and companies have difficulty planning into the future. Executives oversee numerous projects and in the words of one CFO, “the time and manpower needed to implement a full analysis is a luxury that is not available.” Given such a setting, managers may make satisficing choices (Simon (1956a)). Perhaps, the best management can do is make incremental, path-dependent improvements relative to their current situation (Kay and King (2020)), with simple, conservative decision rules working as well as any in deciding the direction for that step.⁶⁴ As one CFO notes, “you can’t rely on Black-Scholes in this setting.” Such a satisficing view in a complex world

⁶² One might hypothesize that the creation of new firms leads to new processes and decision rules being introduced, with natural selection allowing these new methods to become dominant. Put differently, stickiness in decision rule innovation might be exacerbated by lulls in new firm creation.

⁶³ Future research should also investigate how a given company chooses a given approach in the first place. As an example, a financial executive from Company A was once a guest speaker in a corporate finance class I was teaching. This individual later moved to Company B and then to Company C, taking the methodologies and notation used in Company A with him to Companies B and C even though the three companies were in different industries. A different executive from C recently presented in class and her presentation substantially overlapped with the approach and notation described earlier when the first presenter was with A. This anecdote suggests a person-dependent introduction of finance norms and aligns with executive fixed effects as in Bertrand and Schoar (2003). Moreover, stability in decision processes that lasts longer than a typical CFO’s career suggests institutional fixed effects. Mukhlynina and Nyborg (2020) argue that this sort of sociological norm explains the clusters of common valuation techniques used by analysts. Better understanding how decision rules are propagated in firms would help us better interpret whether executive fixed effects are evidence of optimal matching versus ad hoc choices.

⁶⁴ Baumol (1979) describes satisficing in the context of looking for a needle in a haystack that contains many needles. The needle that would allow the searcher to sew optimally is in the haystack. Satisficing behavior occurs when the searcher stops searching once a needle is found that allows the sewing to be completed in a reasonable manner (rather than searching until the perfect needle is found). In a complex and uncertain world, it may be impossible for businesses to optimize in a sophisticated way, or the benefits of finding better decision rules may be outweighed

can explain why different firms use different decision rules, respond to shocks heterogeneously, and stick with simple rules that work adequately. Future research should explore the types of corporate outcomes that we might expect to observe if managers satisfice one step at a time, as well as the types of models and empirical tests that would be ideal to investigate these outcomes. Of course, satisficing is not the only modeling approach that should be explored in explaining observed corporate behavior (see footnote 59).

Another consideration is whether financial policies are the primary determinants of corporate decisions versus one part of an interdisciplinary approach that includes strategic (nonfinancial) managerial objectives, perhaps in a Modigliani and Miller (1958) sense. Settings in which nonfinancial objectives dominate, and finance plays more of a support role, may help explain why simple, sticky financial decision-making rules persist.

How should we evaluate whether the gap between academia and the practice of finance is narrowing? We can, of course, evaluate the extent of alignment between research and real-world outcomes using traditional measures of in-sample goodness of fit in empirical analysis of specific policies related to, say, hiring, investment, capital structure, and payout. A more stringent test would evaluate out-of-sample performance, which can help address the concern of overfitting models in-sample (see Harvey (2017)). It would also be useful to gauge whether a given area of research aligns well enough with reality to provide reliable guidance to practitioners and policy-makers. Finally, academic models could be evaluated against the degree to which their predictions are consistent with other characteristics of the decision process itself. For example, academic modeling makes simplifying assumptions to highlight key principles of a complex world. Simplification is also evident in real-world decision processes. Ideally, the academic and practitioner simplifications would align in a way that helps research explain the common themes in the practice of finance. For example, if a model assumes miscalibration or another characteristic, the model could be tested by whether it leads to decision rules that are conservative, simple, and sticky.

In sum, while many excellent research papers are published every year, a gap remains between the body of existing academic research and the practice of corporate finance. A rich opportunity thus exists for researchers to close this gap and in the process address a number of important, unanswered questions. Closing the gap will benefit practitioners, policy-makers, researchers, and teachers alike. I believe that it makes sense to use information on what expert executives actually do and why they do it, as well as their expectations and plans for the future, as the foundation of academic research that pursues this endeavor.

by the costs of continuing to search. Simon (1957) associates satisficing choices with individuals for whom bounded rationality prevents global optimization.

VIII. Conclusion

In this paper, I document important elements of the practice of corporate finance, which can serve as a benchmark in guiding and evaluating academic research. To be sure, companies incorporate certain economic principles into their financial decision-making. Nonetheless, there is a notable gap between academic corporate finance research and practice. The impact and relevance of research would increase by narrowing this gap.

In my view, there is much to gain by carefully grounding research in what skilled real-world practitioners actually do.⁶⁵ When academic models and practice align, a thorough understanding of the latter enhances our ability to understand the mechanisms behind real economic outcomes. When models and practice do not align, knowledge about practice helps distinguish whether practice, theory, or both are at fault.

If managers are at fault, a detailed understanding of practice can allow researchers to assess whether managers make correctable mistakes; and if so, evaluate the consequences of those mistakes; and if those consequences are large, determine what changes could be made to measurably improve corporate decisions.⁶⁶ By construction, this series of steps connects research to practice and may ultimately lead to extra emphasis on affecting practice by producing actionable guidance and practical business education.

If academic models are at fault, how should researchers try to close the research-practice gap? One approach would be to integrate common themes of the practice of finance into traditional or new frameworks. A second, related, approach would be to take managers' behavior (the themes and stylized facts described above) as given and determine whether there is a rational or behavioral model that is consistent with the real-world practice of corporate finance. Researchers following this approach should be careful not to "model mine" or develop a separate theory for each fact. Furthermore, it is not clear that the traditional research tool-kit will suffice in tackling these issues. A

⁶⁵ At a minimum, instructors should accurately describe to students what companies actually do. While there is a high level of alignment between the textbook view and the practice of finance along some dimensions, along other dimensions, there are long-standing exceptions to textbook recommendations. It may be worth classroom instruction renewing emphasis on foundational corporate finance, including the risks and pitfalls of not following academic recommendations. At the same time, academics should acknowledge that the practice of finance may differ from the textbook perspective for good reasons. It is thus important that we understand whether these differences imply suboptimality among firms, or whether they reflect too little emphasis on basic but important issues in academic research and teaching.

⁶⁶ Careful consideration should be given to the interactions between managers potentially being at fault, value implications, and possible corrective actions. If managers are at fault and value-increasing improvements are easy to identify, then why has arbitrage, the market for corporate control, or the market for managerial talent not eliminated actions that reduce value? Are these markets not competitive and well-functioning? Does weak governance allow reduced effort and retention of slack to compensate for operational and financial deficiencies? Or are value implications and the ability to improve on the status quo modest, suggesting that managerial actions are close to optimal given the real-world circumstances that managers face?

third approach might involve a more fundamental assessment of whether common academic paradigms can adequately explain the practice of finance, given that for some important real-world decisions, choices are not made in a manner that aligns with optimizing traditional academic models.⁶⁷ It stands to reason that disciplining academic research against realistic elements of the practice of finance will improve the ability of academics to predict and explain real-world outcomes, as well as provide managers and students with valuable guidance.

Appendix

A. Surveys of Executives Conducted at Duke University

This project is the culmination of 25 years of survey research using the Duke CFO survey to document the practice of corporate finance. I thank my outstanding coauthors for their significant contributions to the following papers:

- Graham and Harvey (2001) examine capital structure, capital budgeting, and cost of capital.
- Brav et al. (2005 (2008)) study payout policy.
- Graham, Harvey, and Rajgopal (2005) examine financial reporting and whether firms sacrifice value to deliver earnings.
- Campello, Graham, and Harvey (2010) study how financial constraints affected corporate decisions during the Great Financial Crisis.
- Graham and Harvey (2010) examine equity risk premia. This analysis has been updated several times through 2018; see <https://faculty.fuqua.duke.edu/~jgraham/resume.html>
- Graham, Hanlon, and Shevlin (2010) examine trapped foreign profits.
- Graham, Hanlon, and Shevlin (2011) study tax effects on profit repatriation.
- Campello et al. (2011 (2012)) explore liquidity management and investment during the Great Financial Crisis.
- Graham, Harvey, and Puri (2013) examine behavioral characteristics of executives and how they affect corporate policies.
- Dichev et al. (2013) study earnings quality.
- Ben-David, Graham, and Harvey (2013) and Boutros et al. (2021) examine managerial miscalibration in stock market forecasts, risk premia, and whether firms learn from forecasting errors.
- Graham et al. (2014) study incentives for tax planning.
- Graham, Harvey, and Puri (2015) examine capital allocation and delegation of decision-making.

⁶⁷ A related possibility is that the noise-to-signal ratio is high and it is difficult for academic models to predict outcomes. In this case, knowing facts about the practice of finance is particularly useful.

- Graham et al. (2017) examine how taxes affect corporate decision-making, including value loss due to nonoptimal tax considerations.
- Giambona, Graham, and Harvey (2017) examine how managerial views on political risk affect investment.
- Giambona et al. (2018) broadly review the practice of risk management.
- Bodnar et al. (2019) examine how executive risk-aversion affects corporate risk management decisions.
- Graham et al. (2022) explore corporate culture.
- Graham, Hanlon, and Shroff (2022) examine the effects of the 2018 Tax Cuts and Jobs Act (TCJA) tax reform and 2020 Coronavirus Aid, Relief, and Economic Security (CARES) Act on corporate decision-making.
- Barry et al. (2022) study how financial flexibility, work-from-home flexibility, and investment flexibility affect corporate plans during the COVID crisis.

An archive of Duke's quarterly Global Business Outlook survey, which underlies most of these projects, can be found at cfosurvey.fuqua.duke.edu.

B. Demographic Variable Definitions

Table A.I contains definitions of key demographic variables.

C. Scenario Planning

The survey documents details about corporate scenario planning. Even though little is known about how companies actually construct and use such plans, much academic research presumes that companies make ex ante decisions by analyzing expected (probability-weighted) costs and benefits, and much classroom instruction suggests that students consider low, medium, and high future paths when making ex ante decisions. The survey collects information about how companies actually use scenario planning and the extent to which they focus on downside versus upside, among other things.

Nearly two-thirds of U.S. firms indicate that they use scenario planning, typically developing scenarios at the level of the entire firm level (versus division or project level); see Panel A of Figure A.1. The median number of scenarios created by both large and small firms is 3 (e.g., downside, base case, upside). From left to right, the mean responses to the four choices in Panel A for large/small firms are 18%/40%, 21%/16%, 32%/12%, and 64%/45%.

Among companies that rely on scenario plans, more than 80% indicate that they use downside-upside types of scenarios (Panel B of Figure A.1). Figure A.2 shows that their plans lean toward downside scenarios more so than upside, perhaps because negative misses are more damaging than positive misses, or perhaps to partially compensate for left-tail miscalibration (though it is worth noting that internal forecasts are also right-tail miscalibrated).

Table A.I
Demographic Variable Definitions

This table defines some of the demographic conditioning variables that are used in the paper. All variables are based on CFO survey responses. For each table in which these variables are used, if the CFO did not answer a given question (i.e., their response was missing for a given variable), their response is excluded when defining the denominator for the demographic variable (e.g., when calculating a mean value presented in a given table). These variables are all binary.

Demographic Variable	Definition
Size	Small: Revenue below \$1B; Large: Revenue greater than or equal to \$1B. Note that results do not change if the large size cutoff were changed to \$1.4B in 2022, to adjust for inflation in the 20 years since Graham and Harvey (2001) used a \$1B cutoff.
Public	No: Firm is private, nonprofit, or government; Yes: Firm is publicly listed.
Growth Prospects	Yes: An answer of “4” or “5” to the question “ <i>Over the next three years, we expect our firm’s growth will be...</i> {1 = <i>Much Slower than other firms in our industry</i> , 2 = <i>Slower...</i> , 3 = <i>About the same...</i> , 4 = <i>Faster...</i> , 5 = <i>Much faster than other firms in our industry</i> ”
Pay Dividends	Yes: the firm pays dividends to its shareholders.
Leverage	Low: the firm’s debt/assets is below 30%; High: the firm’s debt/assets is greater than or equal to 30%.
Cash	Low: the firm’s cash/assets is below 10%; High: the firm’s cash/assets is greater than or equal to 10%.
Financial Flexibility	No: None or a little financial flexibility; Yes: more than a little financial flexibility, to the question “ <i>About how much financial flexibility would you say your company has right now?</i> {0 = <i>None</i> , 1 = <i>A little</i> , 2, 3 = <i>Moderate</i> , 4, 5 = <i>A lot</i> .”
Family Firm	Yes: An answer of “1” or “2” to the question “ <i>To what extent is your firm a “family firm”?</i> {1 = <i>Primarily controlled by</i> , 2 = <i>Not controlled but have influence</i> , 3 = <i>Not family firm</i> , 4 = <i>Don’t Know</i> .” Firms that answered “4” are excluded.
CEO Performance Pay	Yes: An answer of “3,” “4,” “5,” or “6” to the question “ <i>What proportion of your company’s CEO pay is performance based?</i> {1 = <i>None</i> , 2 = <i>1–10%</i> , 3 = <i>11–30%</i> , 4 = <i>31–50%</i> , 5 = <i>51–80%</i> , 6 = <i>> 80%</i> , 7 = <i>Don’t Know / Not Applicable</i> .” Firms that answered “7” are excluded.

D. Accuracy of Forecasts

Table A.II presents information related to the forecast accuracy of 13 variables for which CFOs provided forecasts for 2019. CFO forecasts are least accurate for sales revenue, followed by cash holdings, employment, and profit margin; while they are most likely to be accurate for payout, patents, and trademarks, perhaps because the realizations of these variables are more within a firm’s control. Note that the results are for sample year 2019, a year without many macroeconomic surprises, though the economy in the second half of the year was somewhat weaker than expected.

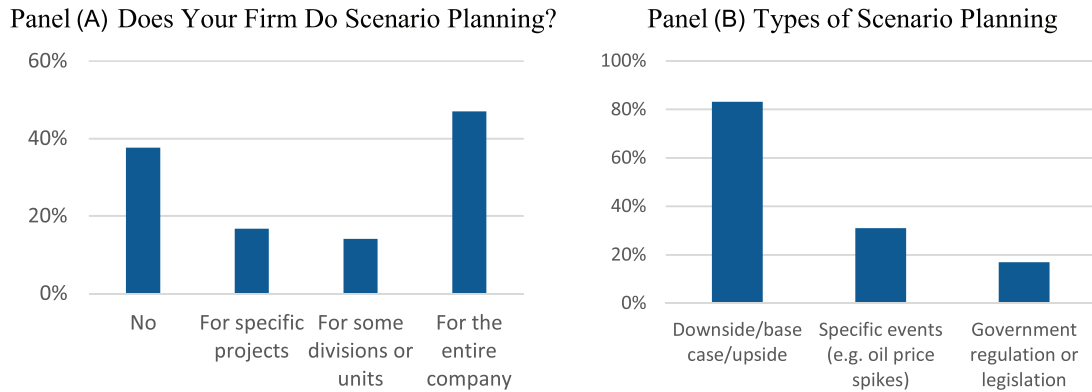


Figure A.1. Scenario planning. This figure displays information on whether firms use scenario planning (Panel A) and which types of scenario planning firms undertake (Panel B). Data are from the June 2019 Duke CFO Survey (not part of the two-wave 2022 survey). Panel A displays the percentage of CFOs that chose each option in response to the question: *Does your company conduct scenario analysis (e.g., good, medium, bad outcomes) as part of your planning? (Choose all that apply)*. Panel B displays the percentage of CFOs that chose each option in response to the question: *What types of scenarios does your firm consider? (Choose all that apply)*. The question in Panel B is conditional on answering the question in Panel A affirmatively. (Color figure can be viewed at wileyonlinelibrary.com)

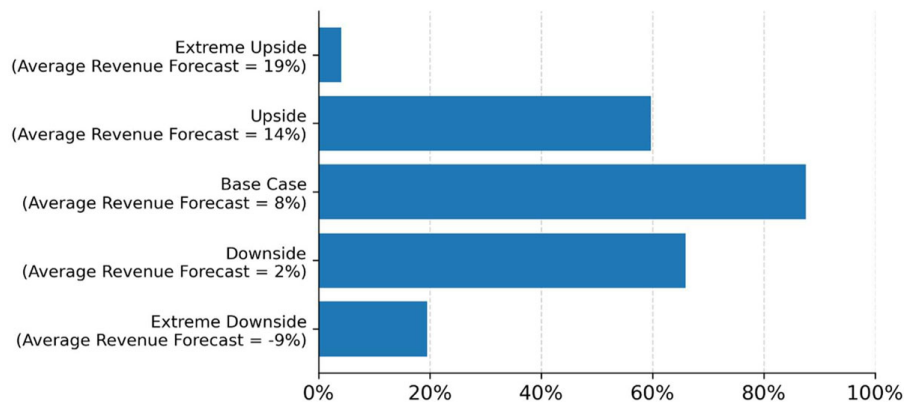


Figure A.2. Scenario planning for cases. Among firms that perform scenario planning, this figure displays responses to the following question: *In your scenario planning, which scenarios receive most of your company's attention and planning?* Data are from the 2022 Duke CFO survey (March 2019 wave). The figure displays the percentage of CFOs that chose each option. For example, 63% of companies include a downside plan among the scenarios they consider (among firms that perform scenario planning). Also shown is the mean forecast for each of the five types of forecasts. For example, among firms making downside (extreme downside forecasts), the mean revenue forecast was +2% (−9%). The modal number of scenarios considered was 3 (i.e., CFOs most often include three scenarios in their plans). (Color figure can be viewed at wileyonlinelibrary.com)

Table A.II
Accuracy of Internal Forecasts

Forecast accuracy of 13 variables for which CFOs provided internal 2019 forecasts as part of the 2019 survey and also provided 2019 realizations as part of the 2020 survey. An accurate forecast is defined as a forecast for which the realization falls within $\pm 20\%$ of the forecast. For example, a forecast of 15% is considered accurate if the realization is within [12%,18%]. About 23% of revenue forecasts were accurate, while 46% (31%) had low (high) realizations relative to forecast.

	Realization < 0.8×Forecast	Accurate	Realization > 1.2×Forecast
Revenue Growth	46.28	22.87	30.85
Year-end Cash/Assets	16.22	27.03	56.76
Employment Growth	31.11	42.78	26.11
Profit Margin	25.00	50.00	25.00
Wage Growth	30.11	50.54	19.35
Capital Spending	30.34	55.86	13.79
Long-Term Borrowing Rate	32.70	60.38	6.92
Year-end Debt Measure	18.60	69.77	11.63
R&D Spending	9.60	75.20	15.20
Trademarks	11.30	83.48	5.22
Patents	7.83	85.22	6.96
Dividends	6.15	86.15	7.69
Repurchases	4.92	89.34	5.74

E. Preparing for Worst-Case Outcomes and Actions Taken Should Worst Case Occur

In Table A.III, CFOs provide written responses indicating what actions their firms take in anticipation of a worst-case scenario occurring (ex ante) and what additional steps they might take if a worst-case outcome actually does occur (ex post). In one part of the survey, companies were asked which of the following scenarios their firms use in the planning process: extreme downside, downside, base case, upside, and extreme upside. From this list, the worst of the five chosen scenarios is shown as the “worst scenario” in Table A.III; for some companies, this was downside; and for others, it was extreme downside. In a separate table, CFOs also indicate how they plan in times of great uncertainty (see Internet Appendix Table IA.VIII).

The next figure shows that the economic variables that CFOs say most affect what type of outcome their firm ends up experiencing ex post (e.g., whether they end up in a downside, middling, or upside outcome).

Table AIII
How Do Companies Prepare for and Manage Worst-Case Scenarios?

The left column shows ex ante steps companies take in anticipation of a worst-case scenario possibly occurring. The right column lists additional steps taken ex post when a worst-case scenario occurs.

Steps to prepare for possibility of worst-case scenario	Additional steps to take if worst-case scenario occurs
<ul style="list-style-type: none"> > Build up cash; reduce debt; strong balance sheet; maintain undrawn credit line. > Careful cash management. > Operate efficiently (expense management, cost control). > Hire slowly; wait until uncertainty clears; automate. > Produce only to firm orders; no overtime. > Grow cautiously; slow expansion; manage inventory; tight rein on spending. > Consolidate operations to cheaper locations. > Diversify via acquisition. > Invest in core operations. > Plan; prepare a list of cutbacks, etc. > Hedge. > Increase demand via advertising; increase clients/customers. 	<ul style="list-style-type: none"> > Issue equity; secure financing; obtain funding from key investors; obtain covenant waiver. > “Survival” cash management. > Slash expenses; reduce discretionary spending; travel freeze. > Hiring freeze; fire employees; reduce workforce; outsource. > Take one-time charge; cut fixed operating expenses. > Defer/cancel strategic investments; cut CapEx, R&D. > Close locations/offices. > Asset sales. > Implement the list of cutbacks. > Price changes; cut marketing. > Bankruptcy; close business.

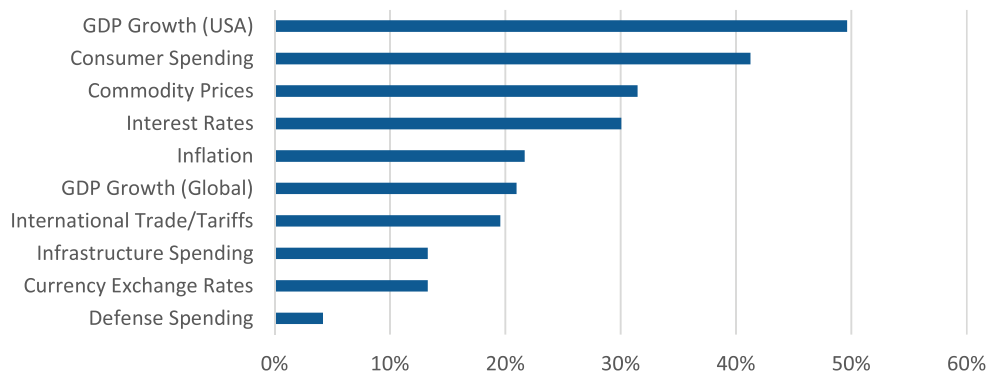


Figure A.3. Macro variables that determine company outcomes. This figure shows which macro variables firms consider most important in causing them to experience a given outcome (e.g., downside, base case, or upside outcome). CFOs were allowed to select up to three answers. The precise wording of the question was: *What economic indicators do you consider most important in causing your firm to actually experience a downside, base case, or upside outcome? (pick up to 3)*. The data come from the 2022 Duke CFO Survey (2019 wave). (Color figure can be viewed at wileyonlinelibrary.com)

REFERENCES

- Adams, Renée B., Amir N. Licht, and Lilach Sagiv, 2011, Shareholders and stakeholders: How do directors decide? *Strategic Management Journal* 32, 1331–1355.
- Almeida, Heitor, and Thomas Philippon, 2008, The risk-adjusted cost of financial distress, *Journal of Finance* 62, 2557–2586.
- Alpert, Marc, and Howard Raiffa, 1982, A progress report on the training of probability assessors, in Daniel Kahneman, Paul Slavic, and Amos Tversky, *Judgment Under Uncertainty: Heuristics and Biases* (Cambridge University Press, Cambridge, England).
- Altig, David, Jose Maria Barrero, Nicholas Bloom, Steven J. Davis, Brent Meyer, and Nicholas Parker, 2020, Surveying business uncertainty, *Journal of Econometrics*, forthcoming.
- Andonov, Aleksandar, and Joshua Rauh, 2020, The return expectations of institutional investors, Working paper, Stanford.
- Bachman, Rudiger, Kai Carstensen, Stefan Lautenbacher, and Martin Schneider, 2020, Uncertainty and change: Survey evidence of firms' subjective beliefs, *Stanford Institute for Theoretical Economics Archives*.
- Baker, Malcolm, and Jeffrey Wurgler, 2002, Market timing and capital structure, *Journal of Finance* 57, 1–32.
- Barrero, Jose M., 2022, The micro and macro of managerial beliefs, *Journal of Financial Economics* 143, 640–667.
- Barry, John W., Murillo Campello, John R. Graham, and Yueran Ma, 2022, Corporate flexibility in a time of crisis, *Journal of Financial Economics* 144, 780–806.
- Baumol, William, J., 1959, *Business Behavior, Value and Growth* (The Macmillan Press, New York).
- Baumol, William J., 1979, On the contributions of Herbert A. Simon to economics, *Scandinavian Journal of Economics* 81, 74–82.
- Bebchuk, Lucian A., Alon Brav, and Wei Jiang, 2015, The long-term effects of hedge fund activism, *Columbia Law Review* 115, 1085–1155.
- Bebchuk, Lucian A., and Roberto Tallarita, 2020, The illusory promise of stakeholder governance, *Cornell Law Review* 106, 91–178.
- Ben-David, Itzhak, John R. Graham, and Campbell Harvey, 2013, Managerial miscalibration, *Quarterly Journal of Economics* 128, 1547–1584.
- Benmelech, Efraim, Nitish Kumar, and Raghuram Rajan, 2020, The decline of secured debt, *NBER Working Paper* 26637.
- Berk, Jonathan B., Richard Stanton, and Josef Zechner, 2010, Human capital, bankruptcy, and capital structure, *Journal of Finance* 65, 891–926.
- Bertrand, Marianne, and Antoinette Schoar, 2003, Managing with style: The effect of managers on firm policies, *Quarterly Journal of Economics* 118, 1169–1208.
- Bhattacharya, Sudipto, 1979, Imperfect information, dividend policy, and “the bird in the hand” fallacy, *Bell Journal of Economics* 10, 259–270.
- Binsbergen, Jules H. van, 2020, Duration-based stock valuation: Reassessing stock market performance and volatility, *NBER Working Paper* 27367.
- Binsbergen, Jules H. van, John R. Graham, and Jie Yang, 2010, The cost of debt, *Journal of Finance* 65, 2089–2136.
- Binz, Oliver, and John R. Graham, 2022, The information content of corporate earnings: evidence from the Securities Exchange Act of 1934, *Journal of Accounting Research*, forthcoming.
- Blinder, Alan S., 1994, On sticky prices: Academic theories meet the real world, in *Monetary Policy* (The University of Chicago Press, Chicago).
- Bloom, Nicholas, Steven J. Davis, Lucia Foster, Brian Lucking, Scott Ohlmacher, and Itay Saporta-Eksten, 2020, Business-level expectations and uncertainty, *NBER Working Paper* 28259.
- Bodnar, Gordon M., Erasmo Giambona, John R. Graham, and Campbell R. Harvey, 2019, A view inside corporate risk management, *Management Science* 65, 5001–5026.
- Bolton, Patrick, and Antoine Faure-Grimaud, 2009, Thinking ahead: The decision problem, *Review of Economic Studies* 76, 1205–1238.

- Bolton, Patrick, Hui Chen, and Neng Wang, 2013, Market timing, investment, and risk management, *Journal of Financial Economics* 109, 40–62.
- Bolton, Patrick, Neng Wang, and Jinqiang Yang, 2021, Leverage dynamics and financial flexibility, *NBER Working Paper* 26802.
- Bordalo, Pedro, Nicola Gennaioli, Rafael La Porta, and Andrei Shleifer, 2020a, Expectations of fundamentals and stock market puzzles, *NBER Working Paper* 27283.
- Bordalo, Pedro, Nicola Gennaioli, Yueran Ma, and Andrei Shleifer, 2020b, Overreaction in macroeconomic expectations, *American Economic Review*, 110, 2748–2782.
- Boutros, Michael, Itzhak Ben-David, John R. Graham, Campbell R. Harvey, and John W. Payne, 2021, The persistence of miscalibration. *NBER Working Paper* 28010.
- 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.
- Brav, Alon, John R. Graham, Campbell R. Harvey, and Roni Michaely, 2008, Managerial response to the May 2003 dividend tax rate cut, *Financial Management* 37, 611–624.
- Campbell, John Y., and Robert J. Shiller, 1988, Stock prices, earnings, and expected dividends. *Journal of Finance* 43, 661–676.
- Campello, Murillo, Erasmo Giambona, John R. Graham, and Campbell R. Harvey, 2011, Liquidity management and corporate investment during a financial crisis, *Review of Financial Studies* 24, 1944–1979.
- Campello, Murillo, Erasmo Giambona, John R. Graham, and Campbell R. Harvey, 2012, Access to liquidity and corporate investment in Europe during the Financial Crisis, *Review of Finance* 16, 323–346.
- Campello, Murillo, John R. Graham, and Campbell R. Harvey, 2010, The real effects of financial constraints: Evidence from a financial crisis, *Journal of Financial Economics* 97, 470–487.
- Chava, Sudheer, and Michael R. Roberts, 2008, How does financing impact investment? The role of debt covenants, *Journal of Finance* 63, 2085–2121.
- Coibion, Olivier, and Yuriy Gorodnichenko, 2012, What can survey forecasts tell us about information rigidities? *Journal of Political Economy* 120, 116–159.
- Coibion, Olivier, and Yuriy Gorodnichenko, 2015, Information rigidity and the expectations formation process: A simple framework and new facts, *American Economic Review* 105, 2644–2678.
- Cochrane, John H., 2008, The dog that did not bark: A defense of return predictability, *Review of Financial Studies* 21, 1533–1575.
- Cochrane, John H., 2011, Presidential address: Discount rates, *Journal of Finance* 66, 1047–1108.
- DeAngelo, Harry, 2021, The capital structure puzzle: What are we missing? *Working paper, USC*.
- DeAngelo, Harry, and Linda DeAngelo, 2006, Capital structure, payout policy, and financial flexibility, *Working paper, USC*.
- DeAngelo, Harry, Linda DeAngelo, and Toni M. Whited, 2011, Capital structure dynamics and transitory debt, *Journal of Financial Economics* 99, 235–261.
- DeAngelo, Harry, Andrei S. Gonçalves, and René M. Stulz, 2018, Corporate deleveraging and financial flexibility, *Review of Financial Studies* 31, 3122–3174.
- DeAngelo, Harry, and Richard Roll, 2015, How stable are corporate capital structures? *Journal of Finance* 70, 373–418.
- Dcaire, Paul H., 2021, Capital budgeting and idiosyncratic risk, *Working paper, ASU*.
- De La O, Ricardo, and Sean Myers, 2021, Subjective cash flow and discount rate expectations, *Journal of Finance* 76, 1339–1387.
- Dichev, Ilia D., John R. Graham, Campbell R. Harvey, and Shiva Rajgopal, 2013, Earnings quality: Evidence from the field, *Journal of Accounting and Economics* 56, 1–33.
- Edmans, Alex, 2020, Company purpose and profit need not be in conflict if we ‘grow the pie’, *Economic Affairs* 40, 287–294.
- Elkamhi, Redouane, Jan Ericsson, and Christopher A. Parsons, 2012, The cost and timing of financial distress, *Journal of Financial Economics* 105, 62–81.
- Fama, Eugene F., and Kenneth R. French, 1993, Common risk factors in the returns on stocks and bonds, *Journal of Financial Economics* 33, 3–56.
- Fama, Eugene F., and Kenneth R. French, 2020, The value premium, *Working Paper, Chicago*.

- Fischer, Edwin O., Robert Heinkel, and Josef Zechner, 1989, Dynamic capital structure choice: Theory and tests, *Journal of Finance* 44, 19–40.
- Friedman, Milton, 1953, *Essays in Positive Economics* (The University of Chicago Press, Chicago).
- Giambona, Erasmo, John R. Graham, and Campbell R. Harvey, 2017, The management of political risk, *Journal of International Business* 48, 523–533.
- Giambona, Erasmo, John R. Graham, Campbell R. Harvey and Gordon M. Bodnar, 2018, The theory and practice of corporate risk management: Evidence from the field, *Financial Management* 47, 783–832.
- Gennaioli, Nicola, Yueran Ma, and Andrei Shleifer, 2016, Expectations and investment. *NBER Macroeconomic Annual* 30, 379–442.
- Gervais, Simon, and Terrance Odean, 2015, Learning to be overconfident, *Review of Financial Studies* 14, 1–27.
- Gigerenzer, Gerd, 1991, How to make cognitive illusions disappear: Beyond “heuristics and biases”, *European Review of Social Psychology* 2, 83–115.
- Giglio, Stefano, Matteo Maggiori, Johannes Stroebel, and Stephen Utkus, 2021, Five facts about beliefs and portfolios, *American Economic Review* 111, 1481–1522.
- Gitman, Lawrence J., and John R. Forrester, 1977, A survey of capital budgeting techniques used by major U.S. firms, *Financial Management* 6, 66–71.
- Goel, Anand M., and Anjan V. Thakor, 2008, Overconfidence, CEO selection, and corporate governance, *Journal of Finance* 63, 2737–2784.
- Gormsen, Niels J., 2020, Equity factors and firms’ perceived cost of capital, Working paper, University of Chicago.
- Graham, John R., 2000, How big are the tax benefits of debt? *Journal of Finance* 55, 1901–1941.
- Graham, John R., Jillian Grennan, Campbell R. Harvey, and Shivaram Rajgopal, 2022, Corporate culture: Evidence from the field, *Journal of Financial Economics*, forthcoming.
- Graham, John R., Michelle Hanlon, and Terry J. Shevlin, 2010, Barriers to mobility: The lockout effect of U.S. taxation of worldwide corporate profits, *National Tax Journal* 63, 1111–1144.
- Graham, John R., Michelle Hanlon, and Terry J. Shevlin, 2011, Real effects of accounting rules: Evidence from multinational firms’ investment location and profit repatriation decisions, *Journal of Accounting Research* 49, 137–185.
- Graham, John R., Michelle Hanlon, Terry J. Shevlin, and Nemit Shroff, 2014, Incentives for tax planning and avoidance: Evidence from the field, *The Accounting Review* 89, 991–1023.
- Graham, John R., Michelle Hanlon, Terry J. Shevlin, and Nemit Shroff, 2017, Tax rates and corporate decision-making, *Review of Financial Studies* 30, 3128–3175.
- Graham, John R., Michelle Hanlon, and Nemit Shroff, 2022, TCJA and CARES Act effects on decision making: A survey, Working paper, MIT.
- 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.
- Graham, John R., and Campbell R. Harvey, 2010, The equity risk premium amid a global financial crisis, in Robert W. Kolb, ed., *Lessons from the Financial Crisis: Causes, Consequences, and Our Economic Future* (John Wiley & Sons, Inc., Hoboken, NJ).
- Graham, John R., Campbell R. Harvey, and Manju Puri, 2013, Managerial attitudes and corporate actions, *Journal of Financial Economics* 109, 103–121.
- Graham, John R., Campbell R. Harvey, and Manju Puri, 2015, Capital allocation and delegation of decision-making authority within firms, *Journal of Financial Economics* 115, 449–470.
- Graham, John R., Campbell R. Harvey, and Shiva Rajgopal, 2005, The economic implications of corporate financial reporting, *Journal of Accounting and Economics* 40, 3–73.
- Graham, John R., Hyunseob Kim, Si Li, and Jiaping Qiu, 2021, Employee costs of corporate bankruptcy, NBER Working Paper 25922.
- Graham, John R., and Mark T. Leary, 2011, A review of empirical capital structure research and directions for the future, *Annual Review of Financial Economics* 3, 309–345.
- Greenwood, Robin, and Andrei Shleifer, 2014, Expectations of returns and expected returns, *Review of Financial Studies* 27, 714–746.
- Griffin, Thomas P., Greg Nini, and David C. Smith, 2019, Losing control? The 20-year decline in loan covenant restrictions, Working paper, UVA.

- Hackbarth, Dirk, 2008, Managerial traits and capital structure decisions, *Journal of Financial and Quantitative Analysis* 43, 843–881.
- Ham, Charles G., Zachary R. Kaplan, and Mark T. Leary, 2020, Do dividends convey information about future earnings? *Journal of Financial Economics* 136, 547–570.
- Hart, Oliver, and Luigi Zingales, 2017, Companies should maximize shareholder welfare not market value, *Journal of Law, Finance, and Accounting* 2, 247–274.
- Harvey, Campbell R., 2017, Presidential address: The scientific outlook in financial economics, *Journal of Finance* 72, 1399–1440.
- Heaton, J.B., 2002, Managerial optimism and corporate finance, *Financial Management* 31, 33–45.
- Hertwig, Ralph, Greg Barron, Elke U. Weber, and Ido Erev, 2004, Decision from experience and the effect of rare events in risky choices, *Psychological Science* 15, 534–539.
- Holmstrom, Bengt, 1989, Agency costs and innovation, *Journal of Economic Behavior and Organization* 12, 305–327.
- Ingersoll, Jonathan E., and Stephen A. Ross, 1992, Waiting to invest: investment and uncertainty, *Journal of Business* 65, 1–29.
- Ivanov, Ivan, Luke Pettit, and Toni M. Whited, 2021, Taxes depress corporate borrowing: Evidence from private firms, Working paper, IHS.
- Jagannathan, Ravi, David A. Matsa, Iwan Meier, and Vefa Tarhan, 2016, Why do firms use high discount rates? *Journal of Financial Economics* 120, 445–463.
- Jenter, Dirk, and Fadi Kanaan, 2015, CEO turnover and relative performance evaluation, *Journal of Finance* 70, 2155–2184.
- Kahle, Kathleen, and René Stulz, 2021, Why are corporate payouts so high in the 2000s? *Journal of Financial Economics* 142, 1359–1380.
- Kaplan, Steven N., 2018, Are U.S. companies too short-term oriented? Some thoughts, *Journal of Applied Corporate Finance* 30, 8–18.
- Kay, John, and Mervyn King, 2020, Radical Uncertainty: Decision-making for an Unknowable Future (The Bridge Street Press, UK).
- Korteweg, Arthur, 2010, The net benefits to leverage, *Journal of Finance* 65, 2137–2170.
- Korteweg, Arthur, Schwert Michael, and Strebulaev Ilya A., 2022, Proactive capital structure adjustments: Evidence from corporate filings, *Journal of Financial and Quantitative Analysis* 57, 31–66.
- Kruger, 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.
- Lemmon, Michael L., Michael R. Roberts, and Jaime F. Zender, 2008, Back to the beginning: Persistence and the cross-section of corporate capital structure, *Journal of Finance* 63, 1575–1608.
- Lian, Chen, and Yurean Ma, 2021, Anatomy of corporate borrowing constraints, *Quarterly Journal of Economics* 136, 229–291.
- Libby, Robert, and Kristina Rennekamp, 2011, Self-serving attribution bias, overconfidence, and the issuance of management forecasts, *Journal of Accounting Research* 50, 197–231.
- Lintner, John, 1956, Distribution of incomes of corporations among dividends, retained earnings, and taxes, *American Economic Review* 46, 97–113.
- Liu, Tim, and Anil Shivdasani, 2019, Do credit ratings matter? Evidence from S&P's 2013 methodology revision, Working paper, UNC.
- Ma, Song, Tianjiao Tong, and We Wang, 2021, Bankrupt innovative firms, *Management Science*, forthcoming.
- Malmendier, Ulrike, 2018, Behavioral corporate finance, in Douglas Bernheim, Stefano DellaVigna, and David Laibson, *Handbook of Behavioral Economics* (Elsevier).
- Malmendier, Ulrike, and Stefan Nagel, 2016, Learning from inflation experiences, *Quarterly Journal of Economics* 131, 53–87.
- Malmendier, Ulrike, and Geoffrey Tate, 2005, CEO overconfidence and corporate investment, *Journal of Finance* 60, 2661–2700.
- Malmendier, Ulrike, and Geoffrey Tate, 2015, Behavioral CEOs: The role of managerial overconfidence, *Journal of Economic Perspectives* 29, 37–60.
- Manski, Charles F., 2018, Survey measurement of probabilistic macroeconomic expectations: Progress and promise, *NBER Macroeconomics Annual* 32, 411–471.

- McDonald, Robert L., 2000, Real options and rules of thumb in capital budgeting, in Michael J. Brennan and Lenos Trigeorgis, *Project Flexibility, Agency, and Competition: New Developments in the Theory and Application of Real Options* (Oxford University Press, New York, NY).
- McDonald, Robert, and Daniel Siegel, 1986, The value of waiting to invest, *Quarterly Journal of Economics* 101, 707–728.
- Meier, Iwan, and Vefa Tarhan, 2003, Corporate investment decision practices and the hurdle rate premium puzzle, Working paper, HEC.
- Miller, Merton H., 1977, Debt and taxes, *Journal of Finance* 32, 261–275.
- Miller, Merton H., 1991, *Financial Innovations and Market Volatility* (Wiley, New York, NY).
- Miller, Merton H., and Kevin Rock, 1985, Dividend policy under asymmetric information, *Journal of Finance* 40, 1031–1051.
- Modigliani, Franco, and Merton H. Miller, 1958, The cost of capital, corporation finance and the theory of investment, *American Economic Review* 48, 261–297.
- Moore, Don A., Elizabeth R. Tenney, and Uriel Haran, 2015, Overprecision in judgment, in George Wu and Gideon Keren, *Handbook of Judgment and Decision Making* (Wiley, New York, NY).
- Mukhlynina, Lilia, and Kjell G. Nyborg, 2020, The choice of valuation techniques in practice: Education versus profession, *Critical Finance Review* 9, 201–265.
- Myers, Stewart C., 2002, Outside equity, *Journal of Finance* 55, 1005–1037.
- Myers, Stewart C., and Alexander A. Robichek, 1966, Problems in the theory of optimal capital structure, *Journal of Financial and Quantitative Analysis* 1, 1–35.
- Nakamura, Emi, and Jon Steinsson, 2009, Five facts about prices: A reevaluation of menu cost models, *Quarterly Journal of Economics* 123, 1415–1464.
- Oded, Jacob, and Allen Michel, 2008, Stock repurchases and the EPS enhancement fallacy, *Financial Analysts Journal* 64, 62–75.
- O'Donoghue, Ted, and Matthew Rabin, 1999, Doing it now or later, *American Economic Review* 89, 103–124.
- Payzan-LeNestour, Elise, and Michael Woodford, 2022, Outlier blindness: A neurobiological foundation for neglect of financial risk, *Journal of Financial Economics* 143, 1316–1343.
- Pettenuzzo, Davide, Riccardo Sabbatucci, and Allan Timmermann, 2020, Dividend suspensions and cash flow risk during the COVID-19 pandemic: A dynamic econometric model, Working paper, UCSD.
- Poterba, James M., and Lawrence M. Summers, 1995, A CEO survey of U.S. companies' time horizons and hurdle rates, *Sloan Management Review* 37, 43–53.
- Raghunandan, Aneesh, and Shivaram Rajgopal, 2021, Do socially responsible firms walk the talk? Working paper, Oxford.
- Rampini, Adriano A., and S. Viswanathan, 2010, Collateral, risk management, and the distribution of debt capacity, *Journal of Finance* 65, 2293–2322.
- Scott, James H., 1976, A theory of optimal capital structure, *Bell Journal of Economics* 7, 33–54.
- Sharpe, Steven A., and Gustavo A. Suarez, 2021, Why isn't business investment more sensitive to interest rates? Evidence from surveys, *Management Science* 67, 720–741.
- Shleifer, Andrei, 2019, The return of survey expectations, *NBER Reporter* 1, 14–17.
- Shleifer, Andrei, and Robert W. Vishny, 2003, Stock market driven acquisitions, *Journal of Finance Economics* 70, 295–311.
- Simon, Herbert A., 1956a, Rational choice and the structure of the environment, *Psychological Review* 63, 129–138.
- Simon, Herbert A., 1956b, Rational decision making in business organizations, *American Economic Review* 69, 493–513.
- Simon, Herbert A., 1957, *Administrative Behavior: A Study of Decision-Making Processes in Administrative Organization* (Macmillan, New York, NY).
- Soll, Jack B., and Joshua Klayman, 2004, Overconfidence in interval estimates, *Journal of Experimental Psychology: Learning, Memory, and Cognition* 30, 299–314.
- Stein, Jeremy C., 1996, Rational capital budgeting in an irrational world, *Journal of Business* 69, 429–455.

- Strebulaev, Ilya A., and Toni M. Whited, 2012, Dynamic models and structural estimation in corporate finance, *Foundations and Trends in Finance* 6, 1–163.
- Stulz, René, 2008, Risk Management Failures: What are they and when do they happen? *Journal of Applied Corporate Finance* 20, 39–48.
- Sufi, Amir, 2009, Bank lines of credit in corporate finance: An empirical analysis, *Review of Financial Studies* 22, 1057–1088.
- Summers, Lawrence H., 1987, Investment incentives and the discounting of depreciation allowances, in Martin Feldstein, *The Effects of Taxation on Capital Accumulation* (University of Chicago Press, Chicago).
- Welch, Ivo, 2004, Capital structure and stock returns, *Journal of Political Economy* 112, 106–131.

Supporting Information

Additional Supporting Information may be found in the online version of this article at the publisher's website:

Appendix S1: Internet Appendix.
Replication Code.