

Prepared for *The Journal of Applied Corporate Finance* Vol. 15, No. 1, 2002

How do CFOs make capital budgeting and capital structure decisions?¹

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March 8, 2002

¹A longer and more detailed version of this paper is published as “The Theory and Practice of Corporate Finance: Evidence from the Field” in the *Journal of Financial Economics* Vol. 60, 2001, pp. 187-243. This research is partially sponsored by the Financial Executives International (FEI) but the opinions expressed herein do not necessarily represent the views of FEI. Graham acknowledges financial support from the Alfred P. Sloan Research Foundation.

1. Introduction

A large body of academic research describes the optimal decisions that corporations should make, given certain assumptions and conditions. Anecdotal evidence, however, suggests that the way that corporations actually make decisions is not always consistent with the academic decision rules. In this paper, we analyze a comprehensive survey that describes the current practice of corporate finance. This allows us to identify areas where the theory and practice of corporate finance are consistent and areas where they are not.

Our survey is distinguished from previous surveys in several ways. First, we examine both capital budgeting and capital structure decisions in detail. This allows us to determine how these corporate policies are interrelated, which provides a rich context within which to understand corporate decision-making. For example, we investigate whether firms that consider financial flexibility a capital structure priority also are likely to value real options in capital budgeting decisions. We explore capital budgeting and capital structure decisions in depth, asking nearly 100 total questions.

Second, we sample a large cross-section of approximately 4,440 firms. In total, 392 Chief Financial Officers responded to the survey, for a response rate of 9%. The next largest survey that we know of is Moore and Reichert (1983) who study 298 large firms. In the *Journal of Financial Economics* version of this paper we show that our sample of respondents is representative of the overall population of 4,400 firms, is fairly representative of COMPUSTAT firms, and is not adversely affected by nonresponse bias.

Third, we analyze the responses conditional on firm characteristics. We examine the relation between the executives' responses and firm size, P/E ratio, leverage, credit rating, dividend policy, industry, management ownership, CEO age, CEO tenure and CEO educational attainment. By testing whether responses differ across these characteristics, we shed light on the

implications of various corporate finance theories related to firm size, risk, investment opportunities, transaction costs, informational asymmetry, and managerial incentives.

The results of our survey are both reassuring and surprising. With respect to capital budgeting, most firms follow academic advice and use present value techniques to evaluate new projects. In contrast, when it comes to making capital structure decisions, corporations rely heavily on practical, informal rules and pay less attention to academic advice. The most important factors affecting debt policy are maintaining financial flexibility and having a good credit rating. When issuing equity, respondents are concerned about earnings per share dilution and recent stock price appreciation. We find little evidence that real world capital structure decisions are made according to academic theories related to asset substitution, asymmetric information, transactions costs, free cash flows, or personal taxes. (If the effects of these theories are, for example, impounded into market prices and credit ratings, and executives respond to prices and credit ratings, it is always possible that executives react to these theories indirectly.)

Interestingly, the survey indicates that firm size significantly affects the practice of corporate finance. For example, large firms are significantly more likely to use net present value techniques, while small firms are more likely to use the payback criterion. A majority of large firms have a tight or somewhat tight target debt ratio, in contrast to only one-third of small firms.

The paper is organized as follows. In the next section, we present the survey design and sampling methodology. In the third section we study capital budgeting. We analyze capital structure decisions in the fourth section. We offer some concluding remarks in the final section.

SURVEY METHODOLOGY

Perhaps the most important aspect to survey research is designing a survey instrument that asks clear and pertinent questions. We took numerous steps in our attempt to achieve this end. We started by developing, over a periods of several months, a draft survey. We circulated this draft to a group of academics and practitioners for feedback. We incorporated their suggestions and revised the survey. We then sought the advice of marketing research experts on the survey design and execution. We made changes to the format of the questions and overall survey design with the goal of minimizing biases induced by the questionnaire and maximizing the response rate.

Using the penultimate version of the survey, we conducted beta tests at both Financial Executives International (FEI) and Duke University.² This involved having graduating MBA students and financial executives fill out the survey, note the required time, and provide feedback. Our beta testers took, on average, 17 minutes to complete the survey. Based on this and other feedback, we made final changes to the wording on some questions. The final version of the survey contained 15 questions, most with subparts, and was three pages long. One section collected demographic information about the sample firms. The survey instrument appears on the Internet at the address <http://www.duke.edu/~charvey/Research/indexr.htm>.

We used two mechanisms to deliver the survey. We sent a mailing from Duke University on February 10, 1999 to each CFO in the 1998 Fortune 500 list. Independently, we faxed 4,440 surveys to FEI member firms on February 16, 1999. Three hundred thirteen of the Fortune 500 CFOs belong to the FEI, so these firms received both a fax and a mailed version. We requested

²FEI has approximately 14,000 members that hold policy-making positions as CFOs, treasurers, and controllers at 8,000 companies throughout the U.S. and Canada. Every quarter, Duke University and FEI poll these financial officers with a one-page survey on important topical issues. See

that the surveys be returned by February 23, 1999. To encourage the executives to respond, we offered an advanced copy of the results to interested parties.

We employed a team of ten Fuqua School of Business MBA students to follow up on the mailing to the Fortune 500 firms with a phone call and possible faxing of a second copy of the survey. On February 23, we refaxed the survey to the 4,440 FEI corporations and we remailed the survey to the Fortune 500 firms, with a new due date of February 26, 1999. This second stage was planned in advance and designed to maximize the response rate.

The executives returned their completed surveys by fax to a third-party data vendor. Using a third party ensures that the survey responses are anonymous. We feel that anonymity is important to obtain frank answers to some of the questions. Although we do not know the identity of the survey respondents, we do know a number of firm-specific characteristics, as discussed below.

Three hundred ninety-two completed surveys were returned, for a response rate of nearly 9%. Given the length (three pages) and depth (approximately 100 questions) of our survey, this response rate compares favorably to the response rate for the quarterly FEI-Duke survey. The response rate is also comparable to other recent academic surveys.³

We received responses from CFOS representing a wide variety of companies. The companies range from very small (26% of the sample firms have sales of less than \$100 million) to very large (42% have sales of at least \$1 billion). We refer to firms with revenues greater than \$1 billion as "large." Forty percent of the firms are manufacturers. The nonmanufacturing firms are evenly spread across other industries, including financial (15%),

<http://www.duke.edu/~jgraham> under "FEI Survey". The usual response rate for the quarterly survey is 8-10%.

transportation and energy (13%), retail and wholesale sales (11%), and high-tech (9%). The median price-earnings ratio is 15. Sixty percent of the respondents have price-earnings ratios of 15 or greater. We refer to these firms as “growth firms” when we analyze how investment opportunities affect corporate behavior. We refer to the remaining 40% of the respondents as nongrowth firms.

[Note: all of this firm and CEO information could be displayed in a series of graphs.]

The distribution of debt levels is fairly uniform. Approximately one-third of the sample firms have debt-to-asset ratios below 20%, another third have debt ratios between 20% and 40%, and the remaining firms have debt ratios greater than 40%. We refer to firms with debt ratios greater than 30% as “highly levered.” The creditworthiness of the sample is also dispersed. Twenty percent of the companies have credit ratings of AA or AAA, 32% have an A credit rating, and 27% have a BBB rating. The remaining 21% have speculative debt with ratings of BB or lower.

Though our survey respondents are CFOs, we ask a number of questions about the characteristics of the chief executive officers. We assume that CEOs are the ultimate decision-makers and that CFOs act as agents for the CEOs. Nearly half of the CEOs for the responding firms are between 50 and 59 years old. Another 23% are over age 59, a group we refer to as “mature.” Twenty-eight percent of the CEOs are between the ages of 40 and 49. The survey reveals that executives change jobs frequently. Nearly 40% of the CEOs have been in their jobs less than four years, and another 26% have been in their jobs between four and nine years. We define the 34% who have been in their jobs longer than nine years as having “long tenure.” Forty-one percent of the CEOs have an undergraduate degree as their highest level of

³For example, E. Trahan and L. Gitman, “Bridging the theory-practice gap in corporate finance: a survey of chief financial officers”, *Quarterly Review of Economics and Finance* Vol. 35, 1995, pp. 73-87, obtain

educational attainment. Another 38% have an MBA and 8% have a non-MBA masters degree. Finally, the top three executives own at least 5% of the common stock of their firm in 44% of the sample.

These CEO and firm characteristics allow us to examine whether managerial incentives or entrenchment affect the survey responses. We also study whether having an MBA affects the choices made by corporate executives. All in all, the variation in executive and firm characteristics permits a rich description of the practice of corporate finance, and allows us to infer whether corporate actions are consistent with academic theories. An important point throughout the survey is that our results represent CFO beliefs or opinions. We have no way of verifying that the beliefs coincide with actions.

CAPITAL BUDGETING DECISIONS

This section studies how firms evaluate investment projects. Previous surveys suggest that internal rate of return (IRR) is the primary method for evaluation. For example, Gitman and Forrester (1977), in their survey of 103 large firms, find that only 9.8% of firms use net present value as their primary method and 53.6% report IRR as primary method.⁴

Our survey differs from previous work in several ways. The most obvious difference is that previous work almost exclusively focuses on the largest firms. Second, given that our sample is larger than all previous surveys, we are able to control for many different firm characteristics. Finally, we go beyond NPV vs. IRR analysis and ask whether firms use the following evaluation techniques: adjusted present value, payback period, discounted payback period, profitability index, and accounting rate of return. We also inquire whether firms bypass

a 12% response rate in a survey mailed to 700 CFOs.

discounting techniques and simply use earnings multiples.⁵ We are also interested in whether firms use other types of analyses that are taught in many MBA programs, such as simulation analysis and value at risk (VaR). Finally, we are interested in the importance of real options in project evaluation.

We asked the CFOs to rate how frequently they use different capital budgeting techniques on a scale of 0 to 4: (0 meaning "never", 1 meaning "almost never", 2 meaning "sometimes", 3 meaning "almost always", and 4 meaning "always"). We report the results by summarizing the percentage of CFOs who said that they always or almost always use a particular evaluation technique (i.e., the percentage who answered "3" or "4").

Most respondents select net present value and internal rate of return as their most frequently used capital budgeting techniques (see Fig. 1); 74.9% of CFOs always or almost always use net present value and 75.7% always or almost always use internal rate of return. The hurdle rate is also popular, with 56.9% of CFOs using hurdle rates (presumably in a NPV analysis).

[Insert Fig. 1]

The likelihood that a firm uses a particular technique varies with firm and executive characteristics. Large firms are significantly more likely to use NPV than small firms.⁶ Highly levered firms are significantly more likely to use NPV and IRR than are firms with small debt ratios. This is not just an artifact of firm size because we find a significant difference between high- and low-leverage small firms as well as high- and low-leverage large firms. Interestingly,

⁴L. Gitman and J. Forrester, Jr., "A survey of capital budgeting techniques used by major U.S. firms", *Financial Management* Vol. 6, 1977, pp. 66-71

⁵A price-earnings multiple can be thought of as measuring the number of years it takes for the stock price to be paid for by earnings, and therefore can be interpreted as a version of the payback method.

⁶ Here and throughout the paper, when we refer to results conditional on firm or CEO characteristic, to save space and keep the text flowing, we do not present percentages. Also, we only report conditional results when they are statistically significant. Interested readers can consult the *Journal of Financial Economics* version of the paper for details (cite information in first footnote).

highly levered firms are also more likely to use sensitivity and simulation analysis. Perhaps because of regulatory requirements, utilities are more likely to use IRR and NPV and perform sensitivity and simulation analyses. We also find that CEOs with MBAs are more likely than non-MBA CEOs to use net present value. Firms that pay dividends are significantly more likely to use NPV and IRR than are firms that do not pay dividends, regardless of whether the firm is large or small. Finally, public companies are significantly more likely to use NPV and IRR than are private corporations.

Other than NPV and IRR (and the hurdle rate), the payback period is the most frequently used capital budgeting technique (56.7% always or almost always use). This is surprising because financial textbooks have lamented the shortcomings of the payback criterion for decades: Payback ignores the time value of money and cash flows beyond the cutoff date; the cutoff is usually arbitrary. Small firms use the payback period almost as frequently as they use NPV or IRR. We also find that among small firms, CEOs without MBAs are more likely to use the payback criterion. The payback is most popular among mature CEOs. Payback is also frequently used by CEOs with long tenure. Few firms use the discounted payback, a method that accounts for the time value of money and thereby eliminates one of the payback criterion's deficiencies.

It is sometimes argued that the payback approach is rational for severely capital constrained firms: if an investment project does not pay positive cash flows early on, the firm will cease operations and therefore not receive positive cash flows that are expected to occur in the distant future, or else will not have the resources to pursue other investments during the next few years. We do not find any evidence to support this claim because we find no relation between the use of payback and leverage, credit ratings, or dividend policy. Our finding that payback is used by

older, longer-tenure CEOs without MBAs instead suggests that lack of sophistication is a driving factor behind the popularity of the payback criterion.

McDonald (1998) notes that rules of thumb such as payback and hurdle rates can approximate optimal decision rules that account for the option-like features of many investments, especially in the evaluation of very uncertain investments.⁷ If small firms have more volatile projects than do large firms, this could explain why small firms use these ad hoc decision rules. It is even possible that small firms use these rules not because they realize that they approximate the optimal rule but simply because the rules have worked in the past.

A number of firms use the earnings multiple approach for project evaluation (38.9% always or almost always use). The other capital budgeting techniques are used less frequently. 26.6% of firms use real option evaluation techniques and 20.3% use the accounting rate of return. Only 14% always or almost always use value at risk or some other form of simulation, 12% use profitability index, and 11% use Adjusted Present Value (APV). It is surprising that more than one-fourth of firms use real option evaluation techniques, given that the methodology is fairly new and is somewhat difficult to apply (though it is possible that some firms consider real option payoffs but do not model them using sophisticated techniques). In comparison, it is also surprising that only 11% of firms use APV given that it is fairly easy to use while at the same time flexible enough to handle a wide variety of project evaluation situations.

In summary, compared to previous research, our results indicate increased prominence of net present value as an evaluation technique. In addition, the choice of evaluation technique is linked to firm size and CEO characteristics. Our capital budgeting results differ from those in

⁷R. McDonald in "Real options and rules of thumb in capital budgeting", Brennan, M.J., Trigeorgis, L., (Eds.), *Innovation, Infrastructure, and Strategic Options*, 1998, Oxford University Press, London.

previous surveys, perhaps because we have a more current and diverse sample and ask more detailed questions.

CAPITAL STRUCTURE DECISIONS

Our survey asks a number of questions that investigate how firms make financial decisions. The responses vary from 0 to 4 (0 meaning “not important”, 1 meaning “not very important”, 2 meaning “somewhat important”, 3 meaning “important”, and 4 meaning “very important”). We present our findings in two ways. First, we use figures to provide a quick reference to the important factors that affect corporate financing decisions, grouped by security or topic: straight debt (Fig. 2), foreign debt (Fig. 3), equity (Fig. 4), target debt ratios (Fig. 5), convertible debt (Fig. 6), and debt maturity (Fig. 7). Second, in the text we highlight the most important findings from the capital structure questions and present the results grouped by theoretical hypothesis or concept. These groupings are neither mutually exclusive nor all-encompassing; they are intended primarily to organize the exposition.

Trade-off theory of capital structure choice

Target debt ratios and the costs and benefits of debt. The trade-off theory says that firms have optimal debt-equity ratios, which they determine by trading off the benefits of debt with the costs. In traditional trade-off models, the chief benefit of debt is the tax advantage of interest deductibility. The primary costs are those associated with financial distress and the personal tax expense bondholders incur when they receive interest income.⁸

[Insert Fig. 2]

⁸For example, see F. Modigliani and M. Miller, “Corporate income taxes and the cost of capital: a correction”, *American Economic Review* Vol. 53, 1963, pp. 433-443 and M. Miller, “Debt and taxes”, *Journal of Finance* Vol. 32, 1977, 261-275.

Fig. 2 reports the factors that affect how CFOs choose the appropriate amount of debt for their firms. The corporate tax advantage of debt is moderately important in capital structure decisions: 44.9% of CFOs say it is important or very important. The tax advantage is most important for large, regulated, and dividend-paying firms – companies that probably have high corporate tax rates and therefore large tax incentives to use debt. We also investigate whether firms issue debt when foreign tax treatment is favorable. We find that favorable foreign tax treatment relative to the U.S. is fairly important (52.3% say it is important or very important). Big firms with large foreign exposure are relatively likely to indicate that foreign tax treatment is an important factor. This could indicate that firms need a certain level of sophistication and exposure to perform international tax planning.

[Insert Fig. 3]

In contrast, we find very little evidence that firms directly consider personal taxes when deciding on debt policy (4.5% say personal taxes are important or very important to debt decisions in Fig. 2, while 5% say so for equity decisions, the least popular equity issuance factor in Fig. 4). That is, from what the executives tell us, they do not make capital structure decisions based on perceived tax preferences of a clientele of investors who own the firm's securities (although we can not rule out the possibility that investors choose to invest in firms based on payout policy, or that executives respond to personal tax considerations to the extent that they are reflected in market prices).

[Insert Fig. 4]

When we ask CFOs directly about whether potential costs of distress affect their debt decisions, we find that distress costs are not very important (21.4% in Fig. 2). However, executives are very concerned about their credit ratings (57.1% say credit ratings are important

or very important in Fig. 2, the second most important debt factor), which indicates a concern about distress. Among utilities and firms that have rated debt, credit ratings are a very important determinant of debt policy. Credit ratings are also important for large firms that are in the Fortune 500. Finally, CFOs are also concerned about earnings volatility when making debt decisions (48.1% in Fig. 2), which is consistent with the trade-off theory's prediction that firms reduce debt usage when the probability of bankruptcy is high.

We ask directly whether firms have an optimal or "target" debt-equity ratio. Nineteen percent of the firms do not have a target debt ratio or target range (see Fig. 5). Another 37% have a flexible target, and 34% have a somewhat tight target or range. The remaining 10% have a strict target debt ratio. These overall numbers provide mixed support for the notion that companies trade off costs and benefits to derive an optimal debt ratio. However, untabulated analysis shows that large firms are more likely to have target debt ratios: 55% of large firms have at least somewhat strict target ratios, compared to 36% of small firms. Targets that are tight or somewhat strict are more common among investment-grade (64%) than speculative firms (41%), and among regulated (67%) than unregulated firms (43%). Given that large investment grade firms control the bulk of the U.S. economy, this indicates fairly strong support for the trade-off theory. Finally, targets are important if the CEO has short tenure or is young, and when the top three officers own less than 5% of the firm.

[Insert Fig. 5]

The CFOs also tell us that their companies issue equity to maintain a target debt-equity ratio (51.6% in Fig. 4), especially if their firm is highly levered, firm ownership is widely dispersed, or the CEO is young. Overall, the survey evidence provides moderate support for the trade-off theory.

Deviations from target debt ratios. Modigliani and Miller (1958) imply that if firms care about the amount debt they use, they should think about debt as a proportion of the market value of the firm (and not, for example, as a proportion of the book value of assets).⁹ However, because the market values of debt and equity change frequently with market conditions, strictly targeting a debt ratio would necessitate frequent rebalancing of outstanding debt and equity. In fact, however, firms do not rebalance frequently and actual debt ratios vary across firms and through time. Our survey evidence indicates that only 16.4% of firms say that market equity movements are important or very important to their debt decisions (Fig. 2).

Fisher, Heinkel, and Zechner (1989) propose an explanation of why debt ratios vary over time, even if firms have a target.¹⁰ If there are fixed transactions costs to issuing or retiring debt, a firm only rebalances when its debt ratio crosses an upper or lower hurdle. We find moderate evidence that firms consider transactions costs when making debt issuance decisions (33.5% in Fig. 2), especially among small firms in which the CEO has been in office for at least ten years. However, when we ask whether they *delay* issuing debt (10.2% in Fig. 2) or retiring debt (12.4% in Fig. 2) because of transactions costs, which is a more direct test of the Fisher et al. (1989) hypothesis, the support for the transactions cost story is weak.

Asymmetric information explanations of capital structure

Pecking-order financing hierarchy The pecking-order model assumes that firms do not target a specific debt ratio but instead use external financing only when internal funds are insufficient. Firms try to avoid issuing securities because they feel that they are often underpriced by the market. Myers and Majluf (1984) and Myers (1984) argue that the degree of underpricing is

⁹F. Modigliani, and M. Miller, "The cost of capital, corporation finance, and the theory of investment", *American Economic Review*, Vol. 48, 1958, pp. 261-297.

¹⁰E. Fisher, R Heinkel, and J. Zechner, "Dynamic capital structure choice: theory and tests", *Journal of Finance*, Vol. 44, 1989, pp. 19-40.

larger when the “informational asymmetry” between management and investors is largest; that is, when managers know a great deal more than do outside investors about a security and its likely payout.¹¹ For example, debt is thought to suffer from fewer informational asymmetries than equity because debt payments are contractually fixed. According to this line of reasoning, if firms use external funds they prefer to issue securities in the reverse order of informational asymmetry (i.e., in their reverse order of underpricing): straight debt, convertible debt, and, as a last resort, equity. Note also that Myers and Majluf assume that firms seek to maintain financial slack to avoid the need for external funds.

We ask several questions related to the pecking-order model. We ask if firms issue securities when internal funds are not sufficient to fund their activities, and separately ask if equity is used when debt, convertibles, or other sources of financing are not available. We also inquire whether executives consider equity undervaluation when deciding which security to use, and whether financial flexibility is important.

The most important item affecting corporate debt decisions is management's desire for "financial flexibility" (59.4% say flexibility is important of very important in Fig. 2).¹² This finding is interesting because Graham (2000) shows that firms use their financial flexibility (i.e., preserve debt capacity) to make future expansions and acquisitions, but they appear to retain a lot of unused flexibility even after expanding.¹³ However, the importance of flexibility in the survey responses is not related to informational asymmetry (as measured by firm size or

¹¹See S. Myers, “The capital structure puzzle”, *Journal of Finance*, Vol. 39, 1984, pp. 575-592 and S. Myers and N. Majluf, “Corporate financing and investment decisions when firms have information that investors do not have”, *Journal of Financial Economics*, Vol. 13, 1984, 187-224.

¹²Given that one way to value flexibility is by using real options evaluation techniques, we test whether desire for flexibility is related to the use of real options techniques. In untabulated analysis, we find that firms that desire financial flexibility are more likely to value projects as real options but the difference is not statistically significant.

dividend payout) in the manner suggested by the pecking-order theory. In fact, flexibility is statistically more important for dividend-paying firms, opposite the theoretical prediction (if dividend-paying firms have relatively little informational asymmetry). Therefore, a deeper investigation indicates that the desire for financial flexibility is not driven by the factors behind the pecking-order theory.

Having insufficient internal funds is a moderately important influence on the decision to issue debt (46.8% in Fig. 2). This behavior is generally consistent with the pecking-order model. More small firms than large firms indicate that they use debt in the face of insufficient internal funds, which is consistent with the pecking-order if small firms suffer from larger asymmetric-information-related equity undervaluation. However, there is only modest evidence that firms issue equity because recent profits have been insufficient to fund activities (30.4% in Fig. 4), and even less indicating that firms issue equity after their ability to obtain funds from debt or convertibles is diminished (15.6% in Fig. 4).

Firms are reluctant to issue common stock when they perceive that it is undervalued (rating of 66.9%, the second most important equity issuance factor in Fig. 4). In a separate survey conducted one month after ours, when the Dow Jones 30 was approaching a new record of 10,000, Graham (March 29, 1999 “FEI survey” on <http://www.duke.edu/~jgraham>) finds that more than two-thirds of FEI executives feel that their common equity is undervalued by the market and that only 3% of CFOs think their stock is overvalued. Taken together, these findings indicate that a large percentage of companies are hesitant to issue common equity because they feel their stock is undervalued. Many firms issue convertible debt instead: equity undervaluation

¹³See J. Graham, “How big are the tax benefits of debt?”, *Journal of Finance*, Vol. 55, 2000, pp. 1901-1941.

is the second most popular factor affecting convertible debt policy (50.7% in Fig. 6), a response particularly popular among growth firms.

[Insert Fig. 6]

Finding that firms avoid equity when they perceive that it is undervalued is generally consistent with the pecking order. However, when we examine more carefully how equity undervaluation affects financing decisions, the support for the pecking-order model wanes. In debt decisions, large, dividend-paying firms are relatively more likely to say that equity undervaluation affects their debt policy. In equity decisions, the relative importance of stock valuation on equity issuance is not related to informational asymmetry as indicated by small size and nondividend-paying status, though it is more important for firms with low executive ownership. In general, these findings are not consistent with the pecking-order idea that informationally induced equity undervaluation causes firms to avoid equity financing.

In sum, the importance of financial flexibility and equity undervaluation to security issuance decisions is generally consistent with the pecking-order model of financing hierarchy. However, asymmetric information does not appear to *cause* the importance of these factors, as it should if the pecking-order story is the true model of capital structure choice.

Recent increase in price of common stock. We investigate whether firms issue stock during a "window of opportunity" that arises because their stock price has recently increased, as argued by Loughran and Ritter (1995). Lucas and McDonald (1990) put an informational asymmetry spin on the desire to issue equity after stock price increases: If a firm's stock price is undervalued due to informational asymmetry between insiders and investors, the firm delays

issuing until after an informational release (of good news) and the ensuing increase in stock price.¹⁴

Recent stock price performance is the third most popular factor affecting equity-issuance decisions (62.6% in Fig. 5), in support of the "window of opportunity." Consistent with Lucas and McDonald (1990), the window of opportunity is most important for firms suffering from informational asymmetries (i.e., not paying dividends).

Signaling private information with debt and equity. Ross (1977) and Leland and Pyle (1977) argue that firms use capital structure to convey their quality or future prospects to investors, which academics refer to as "signaling".¹⁵ However, we find very few firms indicating that their debt policy is affected by factors consistent with signaling (only 9.8% say it is important or very important to debt issuance decisions in Fig. 2). In addition to small absolute importance, companies more likely to suffer from informational asymmetries, such as small, private firms, are relatively *unlikely* to use debt to signal future prospects, opposite of what you might expect according to signaling theory. We also find little evidence that firms issue equity to give the market a positive impression of their prospects (21.5% in Fig. 4).

Private information and convertible stock issuance. Brennan and Schwartz (1988) argue that the call or conversion feature makes convertible debt relatively insensitive to asymmetric information (between management and investors) about the risk of the firm.¹⁶ We find moderate support for this argument. Firms use convertible debt to attract investors unsure about the

¹⁴See T. Loughran and J. Ritter, "The new issues puzzle," *Journal of Finance* Vol. 50, 1995, pp. 23-52, and D. Lucas, and R. McDonald, "Equity issues and stock price dynamics", *Journal of Finance*, Vol. 45, 1990, pp. 1019-1043.

¹⁵See S. Ross, "The determination of financial structure: the incentive signaling approach", *Bell Journal of Economics* Vol. 8, 1977, pp. 1-32; and H. Leland and D. Pyle, "Informational asymmetries, financial structure, and financial intermediation", *Journal of Finance*, Vol. 32, 1977, pp. 371-387.

¹⁶M. Brennan and E. Schwartz, "The case for convertibles", *Journal of Applied Corporate Finance* Vol. 1, 1988, pp. 55-64.

riskiness of the company (43.8% say this is an important or very important factor affecting convertible debt issuance decisions in Fig. 6). This response is relatively more popular among firms for which outside investors are likely to know less than management about firm risk, i.e., small firms with large managerial ownership.

Stein (1992) argues that if firms privately know that their stock is undervalued, they prefer to avoid issuing equity.¹⁷ At the same time, they want to minimize the distress costs that come with debt issuance. Convertible debt is "delayed" common stock that has lower distress costs than debt and smaller undervaluation than equity. We find strong evidence consistent with Stein's argument that convertibles are "back-door equity." Among firms that issue convertible debt, the most popular factor is that convertibles are an inexpensive way to issue delayed common stock (58.1% in Fig. 6).

¹⁷J. Stein, "Convertible bonds as backdoor equity financing", *Journal of Financial Economics* Vol. 32, 1992, pp. 3-21

Anticipating improvement in credit ratings. Having private information about credit quality can affect a firm's optimal debt maturity. In theory, if firms privately know they are high quality but are currently assigned a low credit rating, they might issue short-term debt because they expect their rating to improve.¹⁸ In practice, the evidence that firms time their credit worthiness is weak. Only 9% of CFOs say that expecting credit rating improvement is an important or very important factor leading to their companies borrowing short-term (see Fig. 7). This response receives more support from companies with speculative grade debt and those that do not pay dividends. This last answer is consistent with firms timing their credit ratings when they are subject to large informational asymmetries (e.g., when the executives might know something that rating agencies do not).

[Insert Fig. 7]

Timing market interest rates. Although relatively few executives time changes in their credit ratings (something about which they might reasonably have private information), we find surprising indications that executives try to time the market in other ways. We find moderately strong evidence that executives attempt to time interest rates by issuing debt when they feel that market interest rates are particularly low (46.4% in Fig. 2). Market timing is especially important for large firms, which implies that companies are more likely to time interest rates when they have a large or sophisticated treasury department.

We also find evidence that firms issue short-term debt in an effort to time market interest rates. CFOs borrow short-term when they feel that short rates are low relative to long rates (35.9% in Fig. 7) or when they expect long-term rates to decline (28.7%). Finally, we check if firms use foreign debt because foreign interest rates are lower than domestic rates. There is

¹⁸M. Flannery, "Asymmetric information and risky debt maturity choice", *Journal of Finance* Vol. 41, 1986, pp. 19-37.

moderate evidence that relatively low foreign interest rates affect the decision to issue abroad (44.2% say that relatively low foreign interest rates is an important or very important factor affecting the decision to issue foreign debt in Fig. 3). If covered interest rate parity holds, it is not clear to us why firms pursue this strategy.

Agency costs

Conflicts between bondholders and equityholders. Myers (1977) argues that investment decisions can be affected by the presence of long-term debt in a firm's capital structure. Shareholders might "underinvest" and pass up positive NPV projects if they perceive that the profits will be used to pay off existing debtholders. This cost is most acute among growth firms. Myers (1977) argues that firms can limit total debt, or use short-term debt, to minimize underinvestment costs. Froot, Scharfstein, and Stein (1993) argue that firms can hedge or otherwise maintain financial flexibility to avoid these costs of underinvestment.¹⁹

We ask executives if the choice between short- and long-term debt, or overall debt policy, is related to their desire to pay long-term profits to shareholders, not debtholders. The absolute number of firms indicating that their debt policy is affected by underinvestment concerns is small (12.6% in Fig. 2). However, more growth than nongrowth firms are likely to indicate that underinvestment problems are a concern, which is consistent with the theory. We find little support for the idea that short-term debt is used to alleviate the underinvestment problem: Only 9.5% say underinvestment concerns are important or very important to debt maturity decisions in Fig. 7 and there is no difference between growth and nongrowth firms. Overall, support for the underinvestment argument is weak in our survey.

¹⁹S. Myers, "Determinants of corporate borrowing," *Journal of Financial Economics*, Vol. 5, 1977, pp. 147-175; and K. Froot, D. Scharfstein, and J. Stein, "Risk management: coordinating corporate investment and financing policies," *Journal of Finance* Vol, 48, 1993, pp. 1629-1658.

Another conflict between bondholders and stockholders is referred to as “asset substitution.” Stockholders capture investment returns above those required to service debt payments and other liabilities, and at the same time have limited liability when returns are insufficient to fully pay debtholders. The asset substitution story is that stockholders will try to take on high-risk projects, in which they enjoy the upside payoffs without experiencing the full extent of the downside risks. In contrast, bondholders do not like these high-risk projects because they enjoy few of the upside gains but are subject to the downside risks. Leland and Toft (1996) argue that using short-term debt reduces this agency conflict between stockholder and bondholder interests. Green (1984) argues that convertible debt can circumvent the asset substitution problem that arises when firms accept projects that are riskier than bondholders would prefer.²⁰

In contrast to these hypotheses, however, we find little evidence that executives issue short-term debt to minimize asset substitution problems. Only 4% of the executives say that the asset substitution concerns about shareholder preferences for risky projects are an important or very important factor affecting the desire to use short-term debt (see Fig. 7). Similarly, we find little evidence that firms use convertibles to protect bondholders against unfavorable actions by managers or stockholders (1.4% in Fig. 6).

Conflicts between managers and equityholders. Jensen (1986) and others argue that when a firm has ample free cash flow, managers can squander the cash by consuming perquisites or operating inefficiently. We inquire whether firms use debt to commit to disgorging excess free cash flows and thereby disciplining management into working efficiently, as suggested by Jensen. We find very little evidence that firms discipline managers in this way (1.7% in Fig. 2, the third lowest rating among all factors affecting debt policy). It is important to note, however,

²⁰See H. Leland and K. Toft, “Optimal capital structure, endogenous bankruptcy, and the term structure of credit spreads”, *Journal of Finance*, Vol. 51, 1996, pp. 987-1019 and R. Green, “Investment incentives

that a low rating does not necessarily identify a weakness in Jensen's argument; it might mean simply that corporations have not adopted his advice.

Product market and industry factors. The intensity of debt usage varies widely across industries. One explanation for this pattern is that the product market environment or nature of competition varies across industries in a way that affects optimal debt policy. For example, Titman (1984) suggests that customers avoid purchasing a firm's products if they think that the firm might go out of business (and therefore not stand behind its products), especially if the products are unique; consequently, firms that produce unique products might avoid using debt. Alternatively, Brander and Lewis (1986) hypothesize that debt can be used as a "credible threat" to reduce the number of units produced by competitors. By taking on substantial debt, this story goes, a firm indicates that it will produce a lot of units, regardless of circumstances, because it must generate enough revenue to service its debt. Brander and Lewis claim that competitors will produce less in response to this "threat".²¹

We find little evidence that product market factors broadly affect real world debt policy in the manner described by these academic theories. Only 18.7% of executives say that limiting debt so that their firm's customers or suppliers do not become concerned that the firm might go out of business is an important or very important factor (Fig. 2). Moreover, high-tech firms (which we assume produce unique products) are *less* likely than other firms to limit debt for this reason, contrary to Titman's prediction. We do find that, in comparison to nongrowth firms, relatively many growth firms claim that customers might not purchase their products if they are worried that debt usage might cause the firm to go out of business. This is consistent with

debt and warrants", *Journal of Financial Economics*, Vol. 13, 1984, pp. 115-136.

²¹ S. Titman, "The effect of capital structure on a firm's liquidation decision", *Journal of Financial Economics*, Vol. 13, 1984, 137-151, and J. Brander and T. Lewis, "Oligopoly and financial structure: the limited liability effect", *American Economic Review*, Vol. 76, 1986, 956-970.

Titman's theory if growth firms produce unique products. Finally, there is no evidence supporting the Brander and Lewis hypothesis that debt provides a credible production threat (2.3%).

To further investigate why debt ratios vary across industries, we ask executives whether their capital structure decisions are affected by the financing policy of other firms in their industries. We find only modest evidence that managers are concerned about the debt levels of their competitors (23.4% in Fig. 2). Rival debt ratios are relatively more important for regulated companies, Fortune 500 firms, and public firms. We find less support for the idea that equity issuance decisions are influenced greatly by the equity policies of other firms in a given industry (23% in Fig. 4). Finally, we find even less evidence that firms use convertibles because other firms in their industry do so (12.5% in Fig. 6). Overall, these responses provide only limited evidence that firms study competitors' debt ratios before making their own debt decisions. Recall, however, that credit ratings are very important to debt decisions and note that industry debt ratios are an important input for bond ratings.

Control contests. Capital structure can be used to influence, or can be influenced by, corporate control contests and managerial share ownership.²² We find moderate evidence that firms issue equity to dilute the stock holdings of certain shareholders (50.4% of firms in Fig. 4 claim that this is important or very important). This tactic is popular among speculative-grade companies; however, it is not related to the number of shares held by managers. We also ask if firms use debt to reduce the likelihood that the firm will become a takeover target but find little support for this hypothesis (4.8% in Fig. 2).

²² M. Harris, and A. Raviv, "Corporate control contests and capital structure", *Journal of Financial Economics*, Vol. 20, 1988, pp. 55-86, and R. Stulz, "Managerial control of voting rights: Financing policies and the market for corporate control", *Journal of Financial Economics*, Vol. 20, 1988, 25-54.

Risk management. Capital structure can be used to manage risk. Géczy, Minton, and Schrand (1997, p. 1331) note that "foreign denominated debt can act as a natural hedge of foreign revenues" and displace the need to hedge with currency derivatives.²³ We ask whether firms use foreign debt because it acts as a natural hedge, and separately how important it is to keep the source close to the use of funds. Among the 31% of respondents who seriously considered issuing foreign debt, the most popular reason they did so is to provide a natural hedge against foreign currency devaluation (85.8% list this explanation as important or very important in Fig. 3). Providing a natural hedge is most important for public firms with large foreign exposure. The second most important factor affecting the use of foreign debt is keeping the source close to the use of funds (63.4%), especially for small, manufacturing firms.

Risk-management practices can also explain why firms match the maturity of assets and liabilities. If asset and liability duration are not aligned, interest rate fluctuations can affect the amount of funds available for investment and day-to-day operations. We ask firms how they choose debt maturity. The most popular explanation is that firms choose between short- and long-term debt to match debt maturity with asset life (63.5% in Fig. 3). Maturity-matching is most important for small, private firms.

Practical, cash management considerations . Liquidity and cash management affect corporate financial decisions, often in ways that are not as "deep" as the factors driving academic models. For example, many companies issue long-term so that they do not have to refinance in "bad times" (48.8% say this is important or very important in Fig. 7). One interpretation is that this result is further evidence of management views on trends in market interest rates affecting the timing of debt policy. Avoiding bad times is especially important for highly levered,

²³ C. Géczy, B. Minton, and C. Schrand, "Why firms use currency derivatives", *Journal of Finance*, Vol. 52, 1997, pp. 1323-1354

manufacturing firms. The CFOs also say that equity is often issued simply to provide shares to bonus/option plans (53.5% in Fig. 4), particularly among investment-grade firms with a young CEO.

Some responses that were hand-written on the surveys indicate that practical considerations affect the maturity structure of borrowing. Four firms explicitly say that they tie their scheduled principal repayments to their projected ability to repay. Another six diversify debt maturity to limit the magnitude of their refinancing activity in any given year. Other firms borrow for the length of time they think they will need funds, or borrow short-term until sufficient debt has accumulated to justify borrowing long-term.

Other factors affecting capital structure

Common stock and EPS dilution. We investigate whether concern about earnings dilution affects equity issuance decisions. The academic view is that earnings are not diluted (in the long run) if a firm earns the required return on the new equity.²⁴ Conversely, if funds are obtained by issuing debt, the number of shares remains constant and so EPS can increase. However, as more debt is used, equity is levered and therefore more risky, so Modigliani and Miller's "conservation of value" tells us that the stock price will not increase due to higher EPS. Nonetheless, there is anecdotal evidence that executives are concerned about stock issuance diluting earnings per share. To investigate this issue, we ask if concerns about earnings per share affect common stock issuance decisions.

Among the 38% of firms in our sample that seriously considered issuing common equity during the sample period, earnings dilution is the most important factor affecting their decision (68.6% say EPS dilution is important or very important in Fig. 4). The popularity of this

response is intriguing. It either indicates that executives focus more than they should on earnings dilution (if the academic view is correct), or that the standard academic viewpoint misses an important aspect of earnings dilution. EPS dilution is a big concern among regulated companies, even though in many cases the regulatory process ensures that utilities earn their required cost of capital, implying that EPS dilution should not greatly affect share price. Concern about EPS dilution is strong among large, public, dividend-paying firms. It is notable that concern about EPS dilution is less important when the CEO has an MBA than when he or she does not.

Convertible debt We ask the executives whether the ability to call or force conversion is an important feature affecting convertible debt policy. Among the one-in-five firms that seriously considered issuing convertible debt, there is moderate evidence that executives like convertibles because of the ability to call or force conversion (48% say it is important or very important in Fig. 6). Relatively few CFOs indicate that they use convertible debt because it is less expensive than straight debt (41.7%). Companies run by mature executives are more likely to issue convertibles because they view converts as less costly than straight debt.

CONCLUSION

Our survey of the practice of corporate finance is both reassuring and puzzling. For example, it is reassuring that NPV is dramatically more important now as a project evaluation method than, as indicated in past surveys, it was ten or 20 years ago. In contrast, our analysis of capital structure yields some puzzling results. We find that informal criteria such as financial flexibility and credit ratings are the most important debt policy factors. Other informal criteria such as EPS

²⁴ EPS could be diluted in the short-run if, for example, an equity issuance increases the number of shares

dilution and recent stock price appreciation are the most important factors influencing equity issuance. The degree of stock undervaluation is also important to equity issuance, and we know from other surveys that most executives feel their stock is undervalued.

We find moderate support that firms follow the trade-off theory and target their debt ratio. Other results, such as the importance of equity undervaluation and financial flexibility, are generally consistent with the pecking-order view. However, the evidence in favor of these theories does not hold up as well under closer scrutiny (e.g., the evidence is generally not consistent with informational asymmetry causing pecking-order-like behavior), and is weaker still for more subtle capital structure theories. We find mixed or little evidence that signaling, transactions costs, underinvestment costs, asset substitution, bargaining with employees, free cash flow considerations, and product market concerns affect capital structure choice.

We identify fundamental differences between small and large firms. Our research suggests that small firms are less sophisticated when it comes to evaluating risky projects. Small firms are significantly less likely to use the NPV criterion or the capital asset pricing model and its variants. Perhaps our finding about the effect of firm size on corporate decision rules is behind the pervasive relation between size and corporate actions. Further, the fact that the practice of corporate finance differs based on firm size could be an underlying cause of size-related asset pricing anomalies.

In summary, executives use the mainline techniques that business schools have taught for years, IRR and NPV, to value projects. Interestingly, financial executives are much less likely to follow the academically proscribed factors and theories when determining capital structure. This last finding requires additional thought and research. Perhaps the relatively weak support for many capital structure theories indicates that it is time to critically reevaluate the assumptions

outstanding late in the year, after earnings for the year have already been largely determined.

and implications of these mainline theories. Alternatively, perhaps the theories are valid descriptions of what firms should do - but corporations ignore the theoretical advice. One explanation for this last possibility is that business schools might be better at teaching capital budgeting than at teaching capital structure (and therefore firms do not follow academic guidance about capital structure as closely).²⁵ Moreover, perhaps IRR and NPV are more widely understood than capital structure theories because they are more straightforward and have been accepted as mainstream views for longer. Additional research is needed to investigate these issues. It is our hope that our survey will help to strengthen the link between the theory and practice of corporate finance.

²⁵ This in turn might reflect relatively less consensus among academics about capital structure than about capital budgeting.

Capital Budgeting Technique

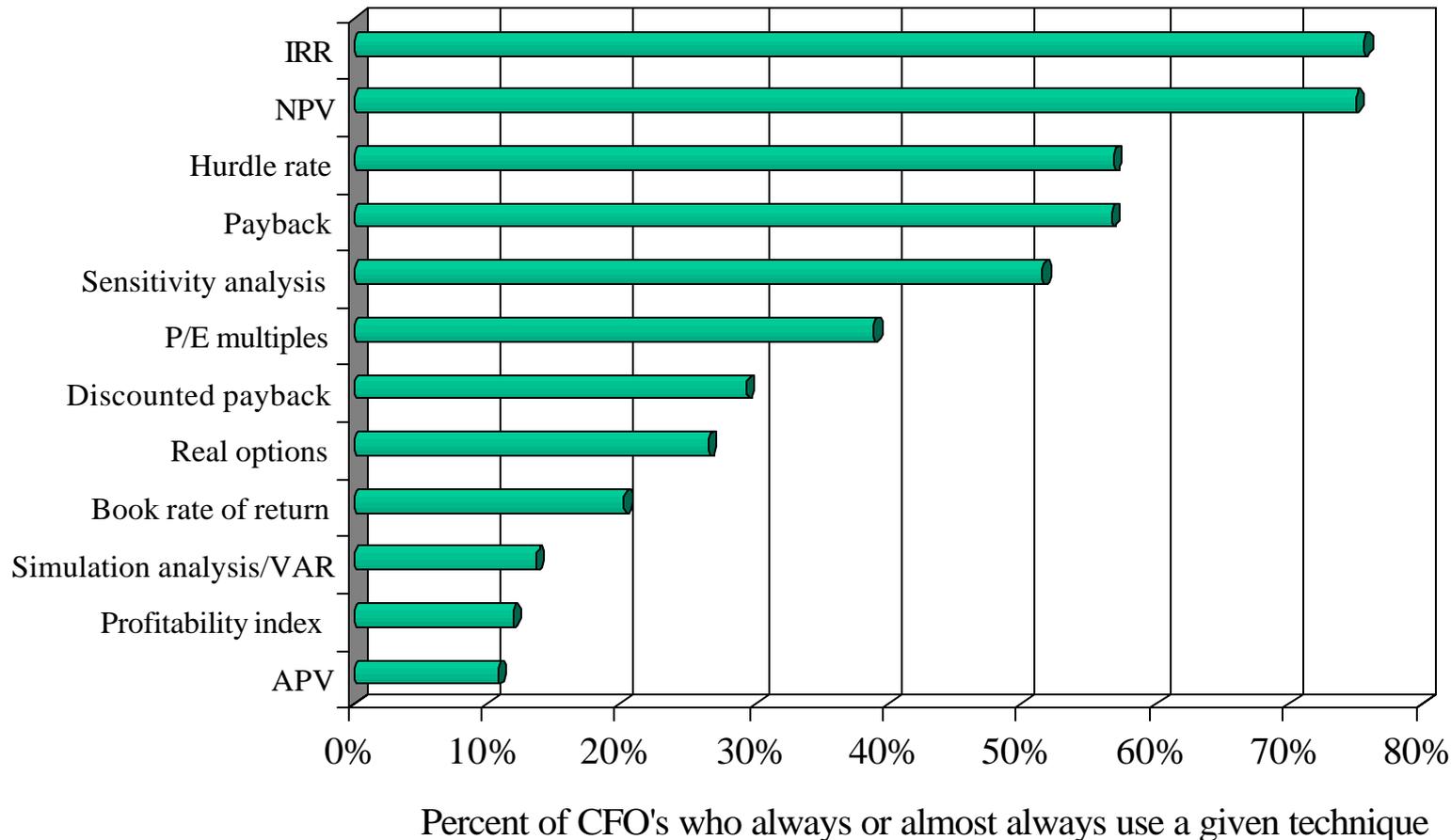


Fig. 1. Survey evidence on the popularity of different capital budgeting methods. We report the percentage of CFOs who always or almost always use a particular technique. IRR represents Internal Rate of Return, NPV is Net Present Value, P/E is the Price to Earnings ratio, VAR is value at risk and APV is Adjusted Present Value. The survey is based on the responses of 392 CFOs.

Debt policy factors

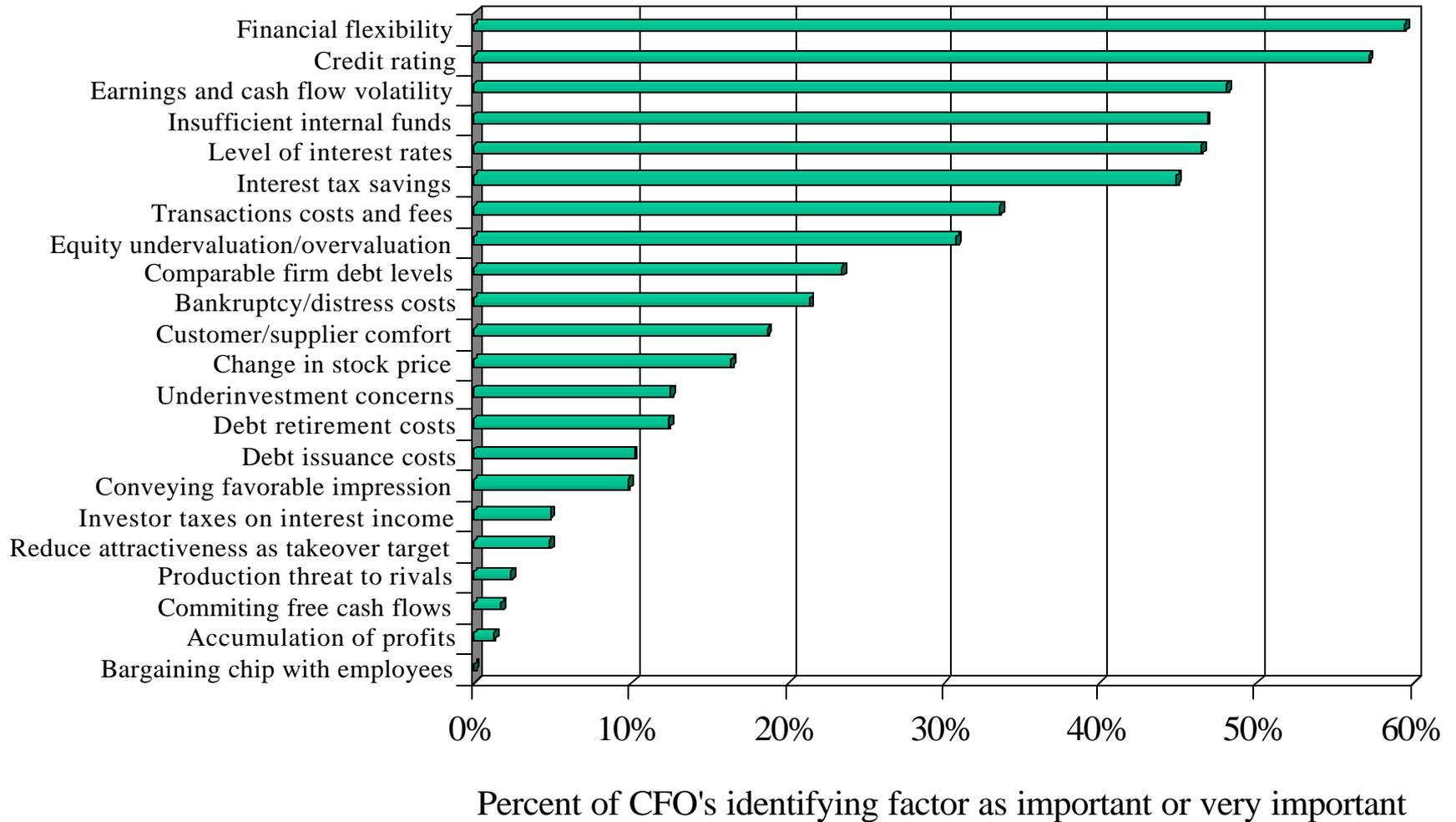


Fig. 2. Survey evidence on some of the factors that affect the decision to issue debt. The survey is based on the responses of 392 CFOs.

Foreign debt policy factors

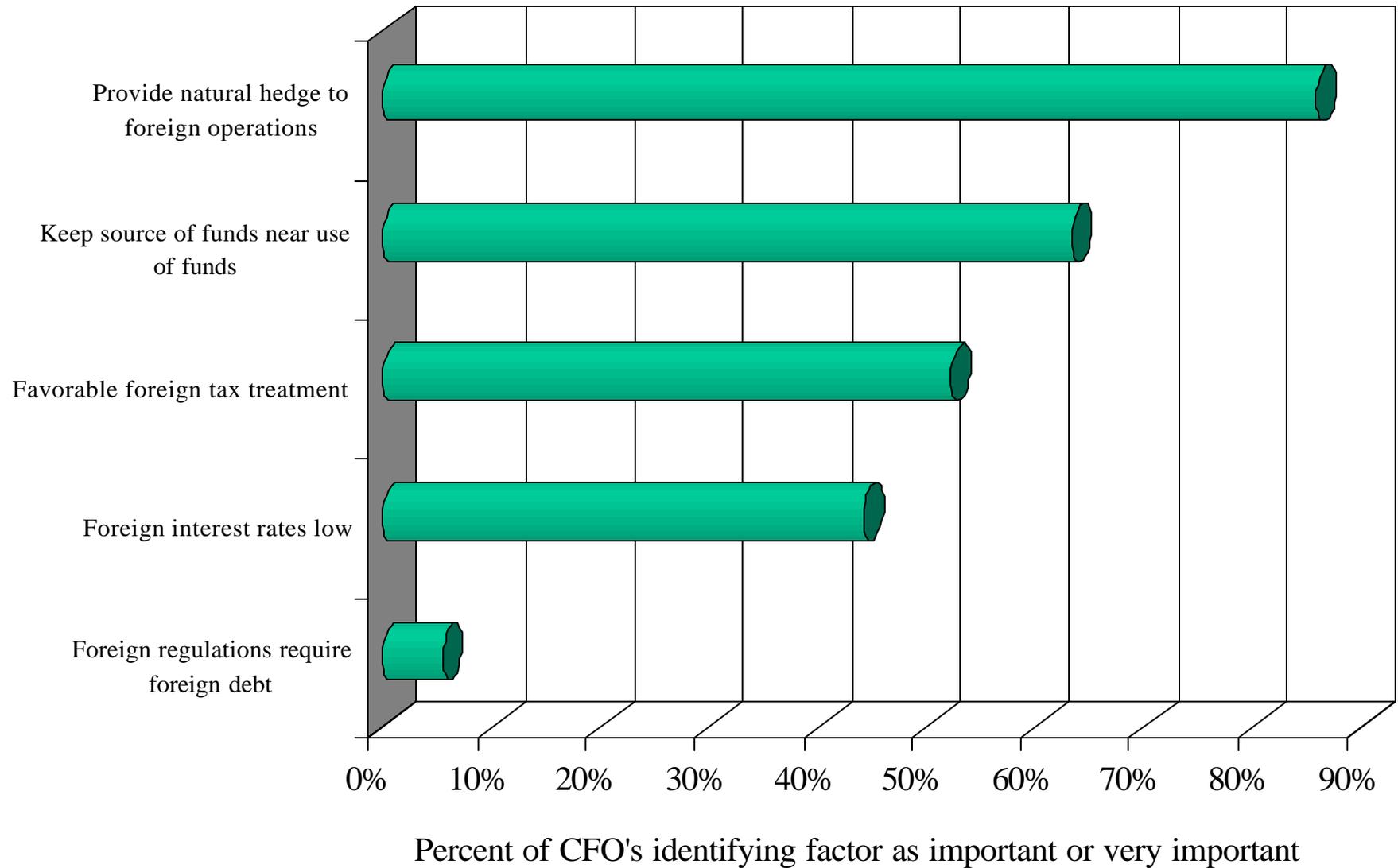


Fig. 3. Survey evidence on some of the factors that affect the decision to issue foreign debt. The survey is based on the responses of 392 CFOs.

Common stock factors

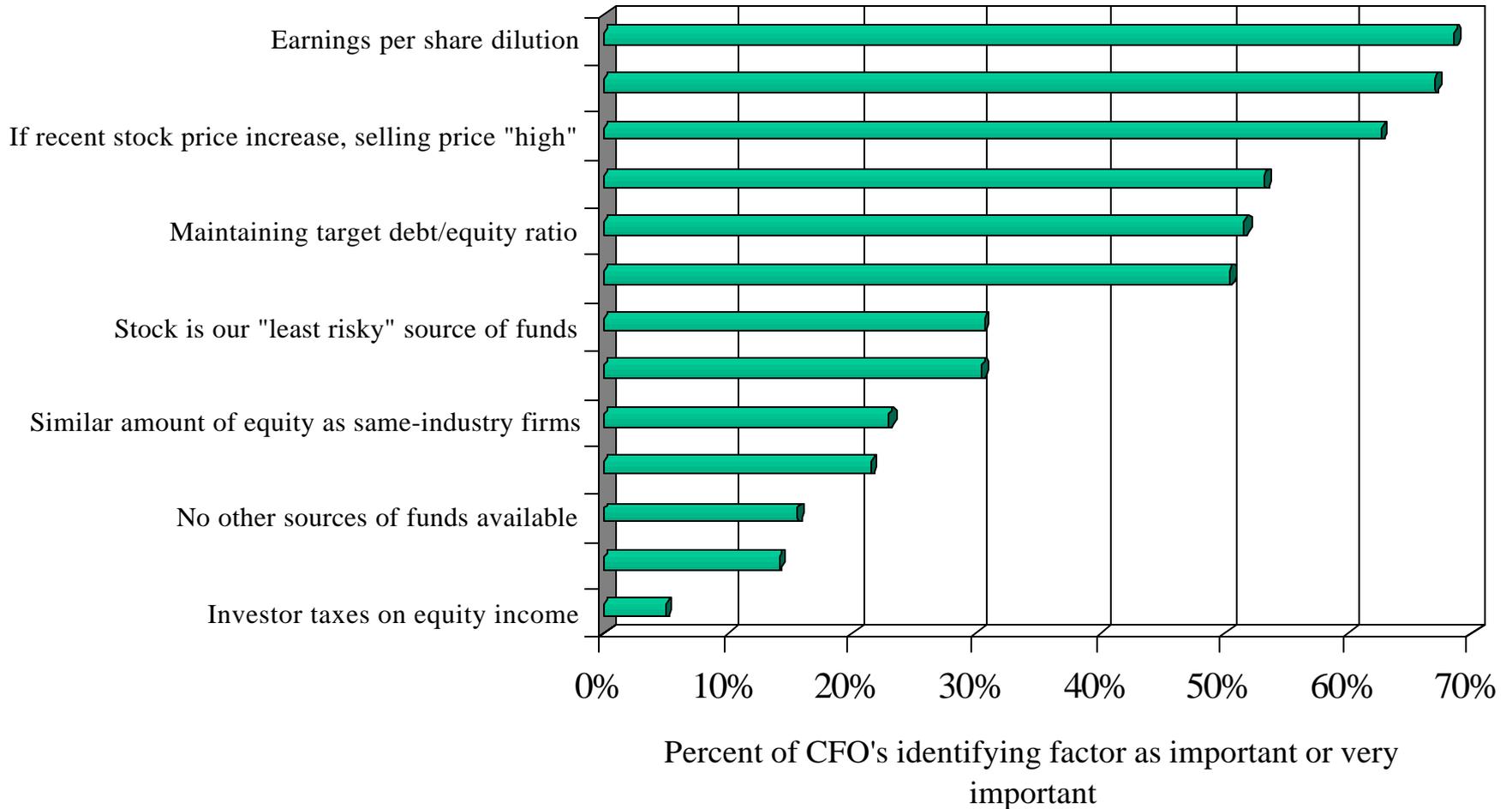


Fig. 4. Survey evidence on some of the factors that affect the decision to issue common stock. The survey is based on the responses of 392 CFOs.

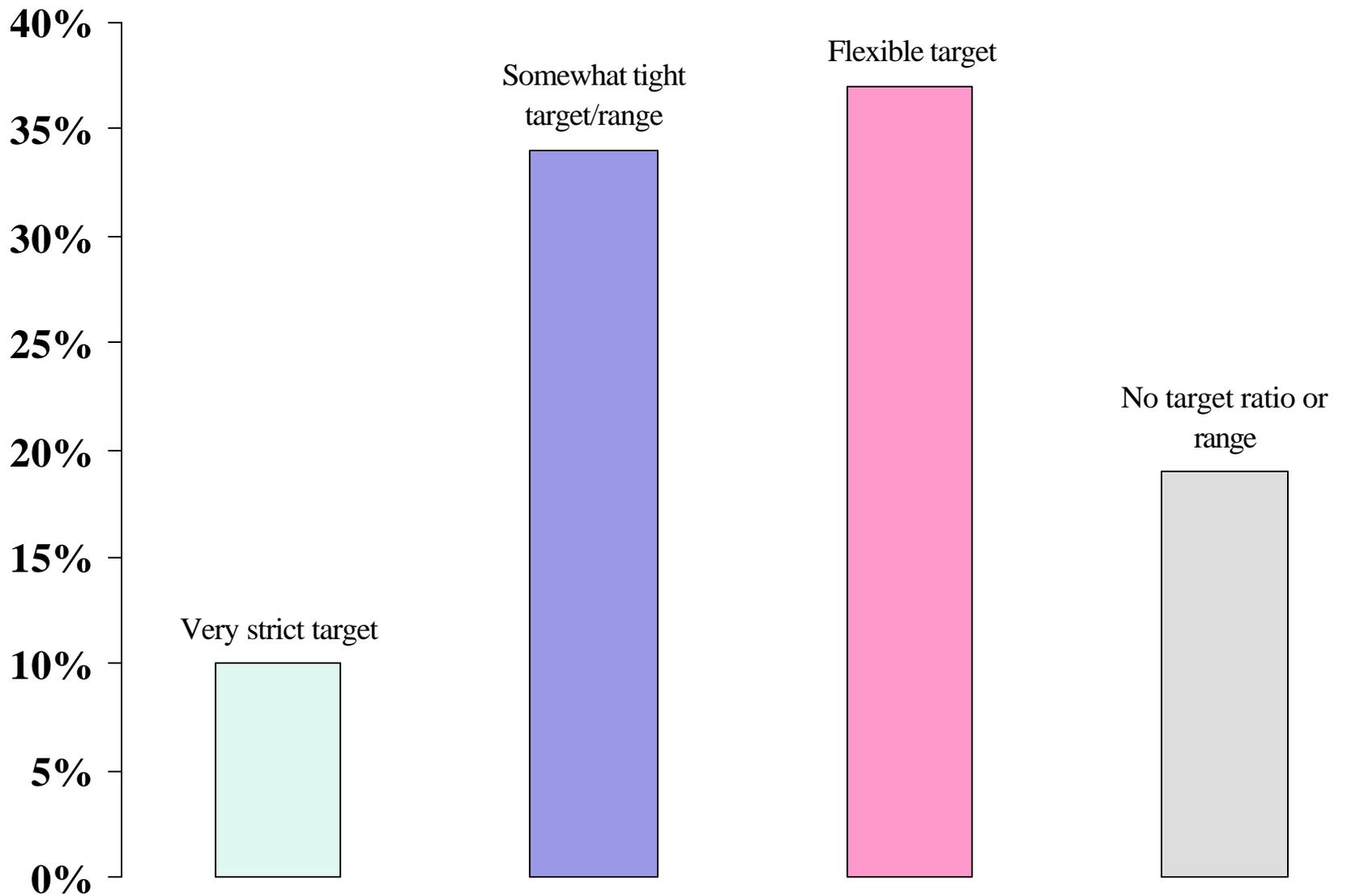


Fig. 5. Survey evidence on whether firms have optimal or target debt-equity ratios. The survey is based on the responses of 392 CFOs.

Convertible debt factors

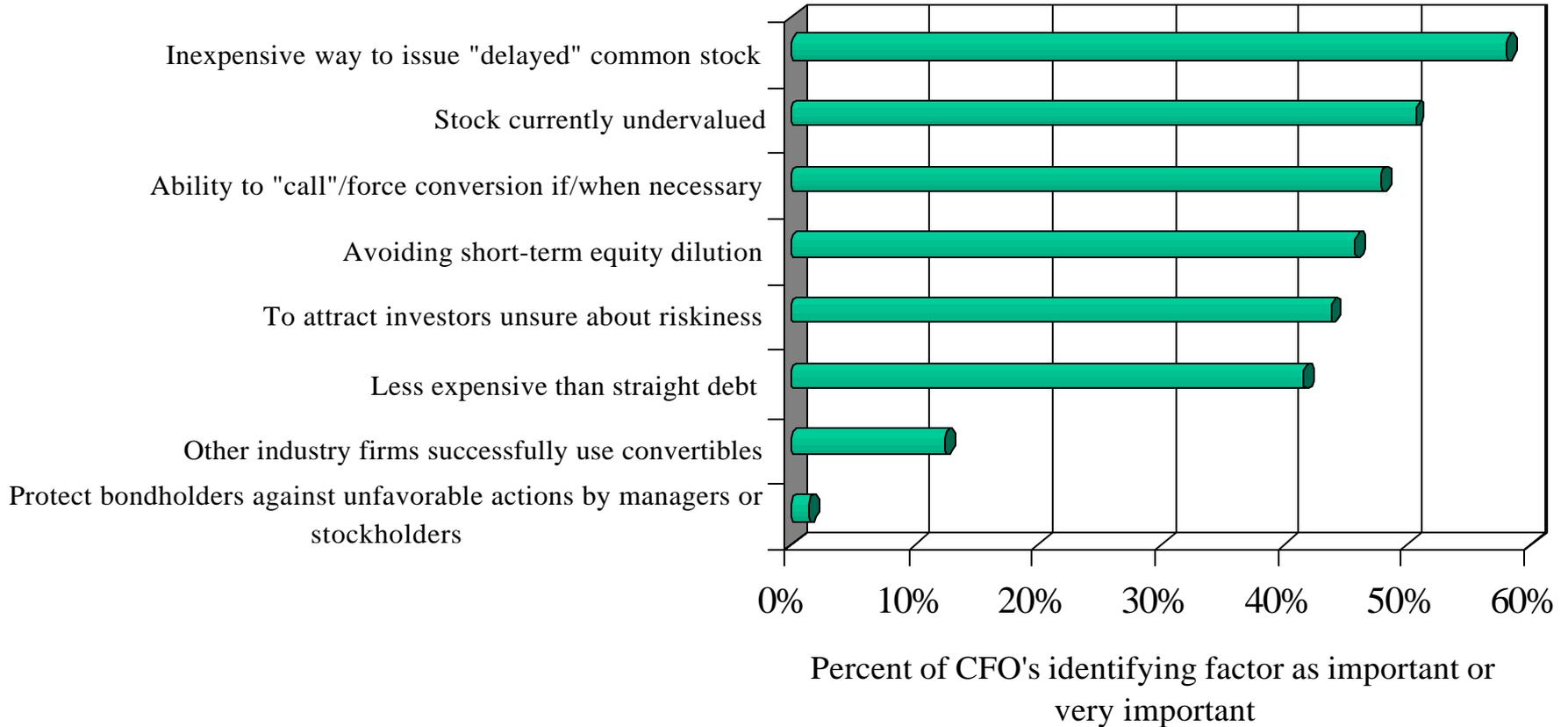


Fig. 6. Survey evidence on the factors that affect the decision to issue convertible debt. The survey is based on the responses of 392 CFOs.

Debt maturity factors

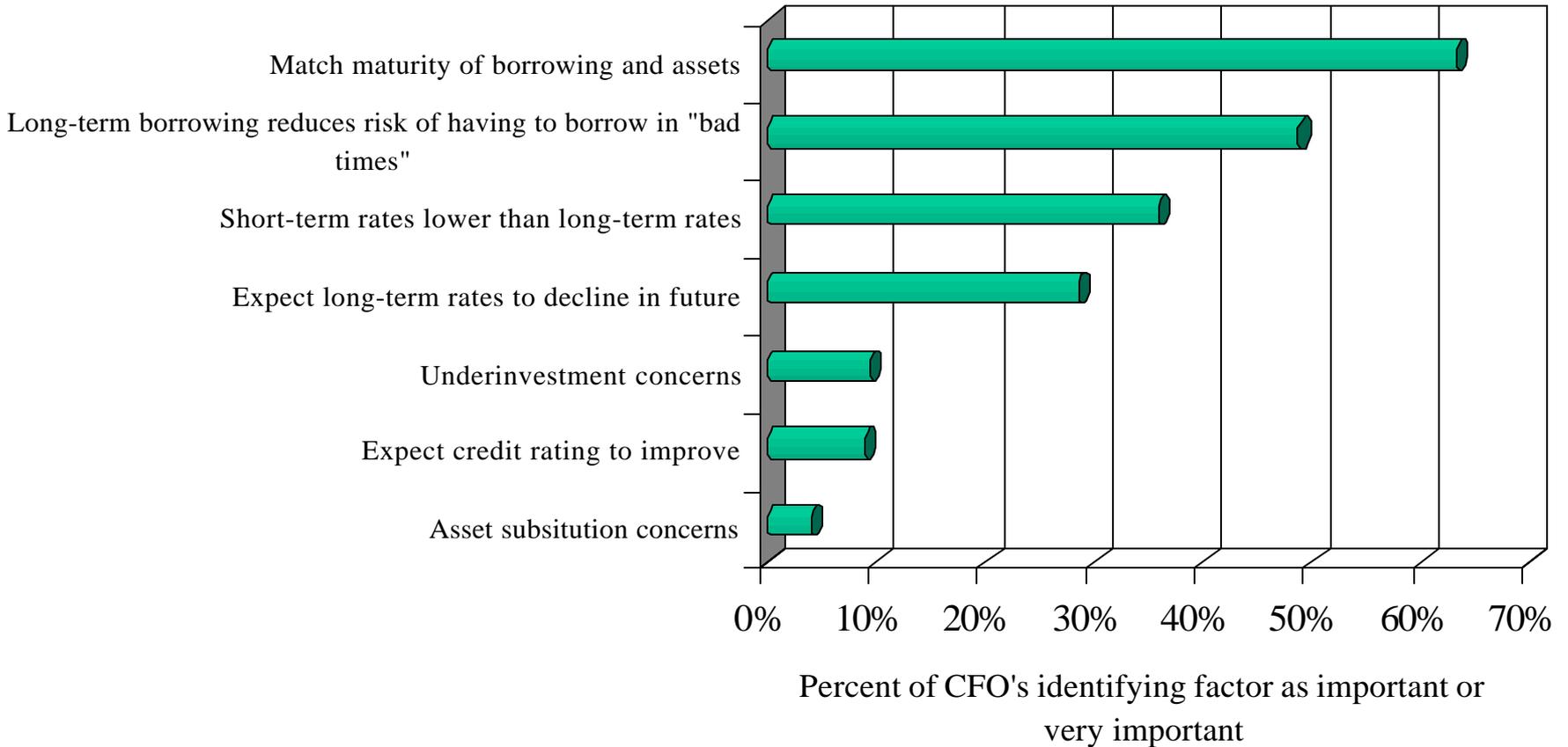


Fig. 7. Survey evidence on the factors that affect the debt maturity decisions. The survey is based on the responses of 392 CFOs.