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journal homepage: www.elsevier.com/locate/jfecWhat do private equity firms say they do?[☆]Paul Gompers^{a,b}, Steven N. Kaplan^{b,c,*}, Vladimir Mukharlyamov^d^a Harvard Business School, Soldiers Field, Boston, MA 02163, USA^b National Bureau of Economic Research (NBER), Cambridge, MA 02138, USA^c University of Chicago Booth School of Business, Chicago, IL 60637, USA^d McDonough School of Business, Georgetown University, Washington, DC 20057, USA

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ABSTRACT

We survey 79 private equity (PE) investors with combined assets under management of more than \$750 billion about their practices in firm valuation, capital structure, governance, and value creation. Investors rely primarily on internal rates of return and multiples to evaluate investments. Their limited partners focus more on absolute performance as opposed to risk-adjusted returns. Capital structure choice is based equally on optimal trade-off and market timing considerations. PE investors anticipate adding value to portfolio companies, with a greater focus on increasing growth than on reducing costs. We also explore how the actions that PE managers say they take group into specific firm strategies and how those strategies are related to firm founder characteristics.

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1. Introduction

The private equity (PE, buyout) industry has grown markedly since the mid-1990s, and academic research

has increasingly focused on the effects of private equity.¹ What have been less explored are the specific analyses and actions taken by PE fund managers. This paper seeks to fill that gap. In a survey of 79 private equity firms managing more than \$750 billion in capital, we provide

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¹ We classify private equity as buyout or growth equity investments in mature companies. Private equity as we define it in this paper is distinct from and does not include venture capital (VC) investments. Many papers in the literature study both venture capital and buyout investments, particularly those related to performance for limited partners. We decided to pursue PE firms instead of VC firms for several reasons. First, PE firms take different actions and invest in different companies than VC firms. Studying the asset classes together would have made the paper even longer and more unwieldy. In contrast, performance can be compared across asset classes, making it sensible to study VC and PE together. Second, PE firms are arguably subject to more controversy about what they do and whether they create value. And, finally, PE is a much larger asset class.

granular information on PE managers' practices in determining capital structure, valuing transactions, sourcing deals, governance, and operational engineering. We also explore how the actions that private equity managers say they take group into specific firm strategies and how those strategies are related to firm founder characteristics.

Recent academic research has provided accumulating evidence that private equity investors have performed well relative to reasonable benchmarks. At the private equity fund level, [Harris, Jenkinson and Kaplan \(2014\)](#), [Higson and Stucke \(2012\)](#), [Robinson and Sensoy \(2013\)](#), and [Ang, Chen, Goetzmann, and Phalippou \(2013\)](#) all find that private equity funds have outperformed public equity markets net of fees since the mid-1980s. The outperformance versus the Standard & Poor's (S&P) 500 in Harris, Jenkinson, and Kaplan is on the order of 20% over the life of a fund and roughly 4% per year. Consistent with that net of fee performance, [Axelson, Sorensen, and Strömberg \(2013\)](#) find outperformance of over 8% per year gross of fees.

At the private equity portfolio company level, [Davis, Haltiwanger, Handley, Jarmin, Lerner, and Miranda \(2014\)](#) find significant increases in productivity in a large sample of US buyouts from the 1980s to early 2000s. [Cohn and Towery \(2013\)](#) find significant increases in operating performance in a large sample of US buyouts of private firms. [Kaplan \(1989\)](#) finds significant increases in public to private deals in the 1980s. [Cohn, Mills, and Towery \(2014\)](#) and [Guo, Hotchkiss, and Song \(2011\)](#) find modest increases in operating performance for public to private buyouts in the 1990s and early 2000s, although Guo, Hotchkiss, and Song find large increases in company values.

From [Gompers and Lerner \(1999\)](#), [Metrick and Yasuda \(2010\)](#), and [Chung, Sensoy, Stern, and Weisbach \(2012\)](#), we also know that the compensation of the partners at the private equity funds creates strong incentives to generate high returns, both directly and through the ability to raise subsequent funds. Strong performance for some funds has led to very high compensation for those investors.

The high-powered incentives combined with the largely positive empirical results are consistent with PE investors taking actions that are value increasing or maximizing. [Kaplan and Strömberg \(2009\)](#) classify three types of value-increasing actions: financial engineering, governance engineering, and operational engineering. These value-increasing actions are not necessarily mutually exclusive, but certain firms likely emphasize some of them more than others.

In financial engineering, PE investors provide strong equity incentives to the management teams of their portfolio companies. At the same time, leverage puts pressure on managers not to waste money. In governance engineering, PE investors control the boards of their portfolio companies and are more actively involved in governance than public company directors and public shareholders. In operational engineering, PE firms develop industry and operating expertise that they bring to bear to add value to their portfolio companies.

Despite the growth in private equity, only a few papers have studied the actions that private equity investors take. Early papers by [Baker and Wruck \(1989\)](#) and [Baker](#)

[\(1992\)](#) explored value creation in individual cases. More recently, [Acharya, Gottschalg, Hahn, and Kehoe \(2013\)](#) study portfolio company performance and relate that performance to PE firm and partner characteristics. Much still remains unknown. No paper examines detailed levers of value creation across financial, governance, and operational engineering.

In this paper, we further explore what PE investors do by reporting the results of a survey of private equity investing practices. First, we identify and tabulate the key decisions that private equity investors make. The range of decisions is significantly more detailed than has been examined in the prior literature. Our survey is structured around examining decisions that support financial, governance, or operational engineering. Second, we attempt to categorize distinct strategies that private equity firms employ.

We survey 79 PE investors [with a total of more than \$750 billion of private equity assets under management (AUM) as of the end of 2012]. We obtain complete answers from 64 of these firms (representing more than \$600 billion of private equity AUM). The sample represents private equity firms across a spectrum of investment strategies, size, industry specialization, and geographic focus. We ask the PE investors questions about financial engineering—how they value companies and how they think about portfolio company capital structures and management incentives; governance engineering—how they think about governance and monitoring; and operational engineering—how they think about value creation, both before and after closing the transaction. We also ask questions about the organization of the private equity firms themselves.

Despite the prominent role that discounted cash flow valuation methods play in academic finance courses, few PE investors use discounted cash flow or net present value techniques to evaluate investments. Instead, they rely on internal rates of return (IRRs) and multiples of invested capital (MOICs). This contrasts with the results in [Graham and Harvey \(2001\)](#), that chief financial officers (CFOs) use net present values as often as internal rates of return. Furthermore, few PE investors explicitly use the capital asset price model (CAPM) to determine a cost of capital. Instead, PE investors target a 22% internal rate of return on their investments on average (with the vast majority of target rates of return between 20% and 25%), a return that appears to be above a CAPM-based rate. We offer several potential explanations for this seemingly ad hoc approach to investment analysis.

We also asked the PE investors how their limited partners (LPs) evaluate the performance of the private equity investors. Surprisingly, the PE investors believe that their LPs are most focused on absolute performance than on relative performance or alphas. This is also puzzling given that private equity investments are equity investments, some of which had been publicly traded prior to a leveraged buyout. Such investments carry significant equity risk, suggesting that equity-based benchmarks such as public market equivalents (PMEs) are appropriate.

Our results on capital structure are more consistent with academic theory and teaching. In choosing the capital structures for their portfolio companies, PE investors

appear to rely equally on factors that are consistent with capital structure trade-off theories and those that are consistent with market timing. The market timing result is consistent with the results in [Axelson, Jenkinson, Strömberg, and Weisbach \(2013\)](#); henceforth [AJSW \(2013\)](#), although the capital structure trade-off theory result is not. These results are, however, somewhat different from those in [Graham and Harvey \(2001\)](#), who find that CFOs focus on financial flexibility.

Financial and governance engineering also appear to be important. In terms of portfolio company management, PE investors expect to provide strong equity incentives to their management teams and believe those incentives are very important. They regularly replace top management, both before and after they invest. And they structure smaller boards of directors with a mix of insiders, PE investors, and outsiders. These results are consistent with research on value-enhancing governance structures that have been identified in other settings.

Finally, PE investors say they place a heavy emphasis on adding value to their portfolio companies, both before and after they invest. The sources of that added value, in order of importance, are increasing revenue, improving incentives and governance, facilitating a high-value exit or sale, making additional acquisitions, replacing management, and reducing costs. On average, they commit meaningful resources to add value, although a great deal of variation exists in how they do so.

We take the responses to the various questions about individual decisions and analyze how various decisions are related to each other by employing cluster analysis and factor analysis. Essentially, we use cluster analysis to explore whether private equity firms follow particular strategies. We find that the answers to our survey cluster into categories that are related to financial engineering, governance engineering, and operational engineering, that is, the levers of value creation highlighted in [Kaplan and Strömberg \(2009\)](#).

We then consider how those strategies are related to firm founder characteristics. Firms with founders who have a financial background tend to focus more on financial engineering, while those who have a previous background in private equity and, to a lesser extent, operations tend to focus more on operational engineering.

In what follows, we assume the PE investor responses are accurate and interpret the survey accordingly. The PE investors filled out the survey with the assurance that they would not be identified and that their responses would be aggregated so they could not be identified. No individual firm thus has any incentive to report overly positive or otherwise inaccurate responses. Doing so will not benefit any one individual firm directly. We recognize, however, that some PE investors could report overly positively on some questions in the hope that the PE industry will be cast in a better light. We discuss how such behavior could affect our results.

The paper proceeds as follows. [Section 2](#) relates the paper to the existing literature. [Section 3](#) discusses the research design and the sample. [Sections 4–6](#) examine PE firms' financial, governance, and operational engineering practices. [Section 7](#) explores the organizational structure

of firms. [Section 8](#) discusses potential concerns stemming from the survey research design. [Section 9](#) explores how the actions that PE managers say they take are reflected into specific firm strategies. [Section 10](#) relates those strategies to firm founder characteristics. [Section 11](#) concludes.

2. Related literature

This paper is related to several strands in the literature. Our survey allows us to evaluate whether and how different corporate finance theories are applied in practice by investors with extremely high incentives to perform and who also have the highest level of education from top business schools. Large academic literatures study firm valuation, capital structure, and governance. Do what private equity investors say they do conform to what researchers think should be done? Our paper explores how these financial decisions are related to firm characteristics.

Research on capital structure has spawned large numbers of papers that seek to explain how firms set their debt and equity structures. Three primary theories receive prominence in the literature. First, the trade-off theory of [Myers \(1977\)](#) predicts that the amount of debt that a firm raises is a balance between the value creation of interest tax shields and the expected cost of financial distress. It is optimal for firms to raise additional debt until the marginal tax shield benefit of the additional dollar of debt equals the marginal increase in expected cost of financial distress. The trade-off theory corresponds to what most introductory finance courses teach about debt policy. Second, the pecking order theory ([Myers, 1984](#)) predicts that firms prefer to raise as much safe debt as possible. Once safe debt is exhausted, firms raise risky debt then equity to fund projects. Third, [Baker and Wurgler \(2002\)](#) propose a theory of capital structure that depends on firm managers timing markets based upon the mispricing of debt or equity. When interest rates are perceived to be particularly low relative to fundamentals, firms increase borrowing, and when equity markets are overvalued, firms would tend to raise more equity. We seek to assess how much of private equity firm managers' leverage decisions are governed by each of these theories.

Governance engineering has been another major area of research in corporate finance. [Jensen and Meckling \(1976\)](#) were among the first scholars to note that agency conflicts exist between managers (who typically own small fractions of equity in the firms that they manage) and outside shareholders. Governance engineering involves creating a better alignment of incentives between managers and shareholders or providing better oversight that can limit empire building and opportunistic behavior. [Gompers, Ishii, and Metrick \(2003\)](#) demonstrate that broad measures of corporate governance are related to public company performance and valuation. [Jensen and Murphy \(1990\)](#) create a framework to measure the incentive effects of equity ownership for firm managers. [Kaplan \(1989\)](#) examines management ownership changes in a sample of leveraged buyouts from the 1980s and finds that ownership substantially increases on average.

Incentive compensation has been a particularly important area of governance research. Jensen (1986) argues that managers of publicly traded firms typically own too little equity to make them sensitive to maximizing shareholder value. Private equity managers who are aware of these issues seek to align incentives through increases in managerial equity ownership.

Boards of directors are often viewed as an important governance tool to monitor managers on behalf of shareholders. Fama and Jensen (1983) discuss the role of boards and how boards should function. Hermalin and Weisbach (1998) examine the determinants of board structure and argue that board structure tends to be endogenously determined to minimize conflicts with shareholders. Coles, Daniels, and Naveen (2008) examine how board size is related to both firm characteristics and firm performance. In general, the literature argues that small boards dominated by outsiders perform better. We examine board strategy issues for private equity investors.

We also examine specific strategies around improvement in operating performance. Many private equity firms market to their investors and potential portfolio companies their ability to increase value by improving operating performance. Kaplan (1989) was the first to find improved operating performance after firms undergo a leveraged buyout. Kaplan and Strömberg (2009) summarize subsequent research largely confirming that private equity investments are associated with improvements in operating performance or productivity. While little research has identified the key operating levers that private equity managers pull to improve performance, several papers have examined the effects of private equity on the operational performance of the companies they own. More recently, Davis, Haltiwanger, Handley, Jarmin, Lerner, and Miranda (2014) use US Census data to study a large sample of US buyouts and find that they are associated with increased productivity. Cohn and Towery (2013) use income tax data to study a large sample of US buyouts and find improvements in operating margins. The exceptions to these positive results are public to private transactions. Cohn, Mills, and Towery (2014) and Guo, Hotchkiss, and Song (2011) find modest, but insignificant, increases in operating margins in US public to private transactions.

In doing these analyses, we view this paper as a complement to the survey papers of Graham and Harvey, beginning with Graham and Harvey (2001).² Graham and Harvey survey chief financial officers to understand how they make capital budgeting, capital structure, and other decisions. They compare their survey findings of practice with the recommendations or insights from different academic theories. In this paper, we do the same. We view this survey as particularly interesting because private equity investors have been so successful (both in terms of generating attractive returns for investors and compensation for their managers), have strong incentives to maximize shareholder value, and, because of those incentives and compensation, very likely attract talented individuals.

Furthermore, a large percentage of private equity investors have been trained at prominent business schools. In recent years, positions in private equity firms have been among the most coveted for graduating master of business administration (MBA) students. A PitchBook 2013 survey showed that a small number of elite business schools accounted for the majority of new hires in private equity. As such, we might expect that private equity investors' practices would approximate what financial economists believe is theoretically (and empirically) value maximizing.

Finally, our paper is complementary to Da Rin and Phalippou (2014), who survey a large sample of PE limited partners. Their survey includes questions on the criteria PE limited partners use in choosing PE investments. Da Rin and Phalippou, however, have relatively little to say about the internal decision-making and strategies of the general partner.

3. Sample and design

In this section, we discuss the implementation of the survey and the sample of firms used in the study.

3.1. Design

We created the survey to determine what PE investors say that they do. We also attempted to design the survey to compare what those investors do relative to what is taught at business schools. We initially tested the survey on three PE investors in the summer of 2011. We revised the survey to reflect some ambiguities in our questions and to add some questions. The final survey contains 92 questions and is available on Paul Gompers's website.³

3.2. Delivery and response

We began to distribute the survey to PE investors in the fall of 2011. We distributed it to firms in which one of us knew or was introduced to a senior investment professional. We continued to identify potential PE investors in 2012. We received our last survey response in the winter of 2013. The vast majority of survey responses, therefore, were received in 2012.

We contacted a total of 136 PE firms. We sent survey links to 106 investors at these firms who expressed an interest in the survey. Of these, 79 filled out some part of the survey and 64 completely filled out the survey. The response rate of roughly 50% is much higher than the response rate for other surveys. Graham and Harvey (2001) obtain a response rate of 8.9% for CFOs, and Da Rin and Phalippou (2014) obtain a response rate of 13.8% for PE limited partners.

3.3. Private equity firm characteristics

Table 1 provides some summary statistics for the firms of the PE investors who responded to the survey. We obtained cumulative assets under management in private

² See also Brav, Graham, Harvey, and Michaely (2005) and Graham, Harvey, and Rajgopal (2005).

³ See http://people.hbs.edu/pgompers/GKM_PE_survey.pdf

Table 1

Private equity (PE) firm respondents.

This table describes the sample PE investor respondents. Reported are assets under management (AUM), performance of most recent fund (if available), and age of each private equity firm in the sample as of December 2012 from Preqin. Information on firms not covered by Preqin is taken from firm websites and the media. We also use the results of the current survey to determine office locations of firms in the sample. IRR=internal rate of return.

	N	Mean	25th percentile	Median	75th percentile	Standard deviation
AUM (millions of dollars)	79	9,548.6	750.0	3,400.0	11,000.0	15,021.1
IRR over benchmark (percent)	58	2.7	-3.9	0.9	6.9	11.8
Multiple of invested capital	58	1.3	1.2	1.3	1.5	0.3
Age (years)	79	19.5	12.0	19.0	26.0	10.5
Firms with						
- office(s) only in the US	44					
- office(s) outside the US	35					

Table 2

Enterprise value.

This table describes the enterprise value of portfolio companies of the sample private equity (PE) investors. Question is: "What fraction of the companies you invest in have the total enterprise value within the following ranges?" The sample is divided into subgroups based on the median of assets under management (AUM), the internal rate of return (IRR) of most recent fund, the age of PE investor, and by whether PE investor has a global presence. Statistical significance of the difference between subgroup means at the 1%, 5%, and 10% levels are denoted by ***, **, and *, respectively.

Enterprise value	Mean	Median	AUM		IRR		Age		Offices	
			Low	High	Low	High	Old	Young	Local	Global
< \$25 million	11.8	0.0	19.0	5.5***	4.4	9.4	6.2	16.1**	16.2	6.3**
\$25 million – \$100 million	26.3	10.0	44.4	10.4***	16.8	23.5	20.1	31.0	33.4	17.5**
\$100 million – \$500 million	28.7	22.0	28.6	28.8	29.3	31.9	31.4	26.6	27.6	30.1
\$500 million – \$1 billion	16.8	10.0	5.2	27.0***	22.0	19.8	19.4	14.9	12.7	21.9**
> \$1 billion	16.4	0.0	2.8	28.3***	27.4	15.3	22.9	11.4**	10.2	24.1**
Number of responses	79	79	37	42	29	29	34	45	44	35

equity, performance of the most recent primary fund (if available), and age of each private equity firm in the sample as of December 2012 from Preqin.⁴ Information on firms not covered by Preqin is taken from firm websites and media articles.

The table shows a large variation in the size of the firms as measured by assets under management. The mean AUM is just under \$10 billion. A quarter of the firms have AUM under \$750 million and a quarter have AUM above \$11 billion.

Our overall sample of 79 firms represents firms with a total of more than \$750 billion in AUM. Our sample of 64 firms that completed the entire survey represents a total of more than \$600 billion in AUM. We have solid coverage of the largest PE firms. Each year, *Private Equity International* (PEI) ranks the top PE firms globally by AUM. Our (fully completed) sample has 11 of the top 25 in PEI's 2012 list. Given this, our results are reflective of a meaningful fraction of the PE industry.

The table also indicates that Preqin has performance data for the most recent fund for 58 of the sample PE firms. The average fund in the sample has an IRR that is 2.7% above Preqin's benchmark IRR for the same vintage year. The median fund is 0.9% above. This suggests that our sample is largely representative of the PE fund universe, at least in terms of performance. If anything, we could have a small bias towards better performers. We do not believe such a bias would influence our results in a meaningful

way. If anything, our sample of firms would be expected to employ better practices than other PE firms and as such their actions should conform more closely to what finance research and courses prescribe.

Despite the apparent representativeness of the sample and the relatively high response rate, we recognize that the sample is potentially selected. This is unavoidable given our requirement that we have an introduction to a senior person and given that PE firms have limited disclosure requirements. Given the large total AUM our sample PE firms control, the survey represents a meaningful fraction of the PE industry.

Table 2 presents the distribution of enterprise values of the portfolio companies in which the PE firms invest. The sample has good representation of many different PE firm enterprise values and covers the broad spectrum of PE investing. The table suggests that almost one-sixth of portfolio company investments by the sample PE firms have enterprise values exceeding \$1 billion and almost 12% have enterprise values below \$25 million.

Table 3 confirms that the private equity investors in our sample are primarily buyout and growth equity investors, not venture capital investors. Over 90% of the PE investors invest in buyouts and almost 75% invest in growth equity. These add up to more than one because many PE investors invest in both buyouts and growth equity. A minority of the sample firms, particularly the older and larger ones, also invests in distressed investments and PIPEs (private investments in public equities).

Finally, consistent with our survey delivery method, Table 4 indicates that over three-quarters of the surveys were completed by a senior PE executive; one with the ti-

⁴ This measures cumulative AUM for the PE firm, not the size of the most recent fund.

Table 3

Type of investments.

This table describes the types of investments considered by the sample private equity (PE) investors. The sample is divided into subgroups based on the median of assets under management (AUM), the internal rate of return (IRR) of most recent fund, the age of PE investor, and by whether PE investor has a global presence. Statistical significance of the difference between subgroup means at the 1%, 5%, and 10% levels are denoted by ***, **, and *, respectively. LBOs=leveraged buyouts; PIPEs=private investments in public equity.

Type of investment	Mean	AUM		IRR		Age		Offices	
		Low	High	Low	High	Old	Young	Local	Global
LBOs	90.1	82.9	97.2**	92.3	96.2	93.9	86.8	92.7	86.7
Growth equity	73.2	74.3	72.2	65.4	73.1	69.7	76.3	73.2	73.3
Distress	29.6	17.1	41.7**	26.9	34.6	30.3	28.9	19.5	43.3**
PIPEs	32.4	20.0	44.4**	38.5	38.5	45.5	21.1**	31.7	33.3
Other	8.5	8.6	8.3	3.8	7.7	9.1	7.9	7.3	10.0
Number of responses	71	35	36	26	26	33	38	41	30

Table 4

Private equity (PE) individual respondents.

This table describes the title of the individual filling out the survey at the sample PE investor firms. The sample is divided into subgroups based on the median of assets under management (AUM), the internal rate of return (IRR) of most recent fund, the age of PE investor, and by whether PE investor has a global presence. Statistical significance of the difference between subgroup means at the 1%, 5%, and 10% levels are denoted by ***, **, and *, respectively.

Title	Mean	AUM		IRR		Age		Offices	
		Low	High	Low	High	Old	Young	Local	Global
General partner or director	25.3	21.6	28.6	31.0	31.0	32.4	20.0	25.0	25.7
Managing partner	22.8	35.1	11.9**	13.8	20.7	20.6	24.4	29.5	14.3
Managing director	29.1	18.9	38.1	37.9	20.7	26.5	31.1	22.7	37.1
Chief financial officer	3.8	5.4	2.4	3.4	6.9	2.9	4.4	6.8	0.0
Other	19.0	18.9	19.0	13.8	20.7	17.6	20.0	15.9	22.9
Number of responses	79	37	42	29	29	34	45	44	35

title general partner, managing partner, or managing director. As such, we feel that the responses are very likely indicative of firm practices employed within the PE organizations broadly.

We also used the PE firm websites to collect the names and educations of all of the partner-level executives at our sample PE firms. We used the titles partner, managing partner, managing director, senior managing director, founder, chief executive officer (CEO), chairman, head, and principal. We identified 767 such individuals. Of these, almost two-thirds have either an MBA or a doctor of law degree (juris doctor or JD)—435 or 57% have an MBA and 54 or 7% have a law degree. Of those with an MBA, 167 (38%) are from Harvard Business School, 52 (12%) are from University of Chicago Booth School of Business, 39 (9%) are from Stanford Graduate School of Business, 32 (7%) are from the Wharton School of the University of Pennsylvania, and 23 (5%) are from Columbia Business School. These figures indicate that the top executives at these firms are highly educated and a very large fraction of them have degrees from what would be considered the top graduate schools. Once again, we believe that, given the educational background of the sample, our PE firms would likely employ industry best practices in their investment process. At the same time, we could have oversampled Harvard and Chicago alums while undersampling Wharton alums.⁵

⁵ The PitchBook database finds that Harvard Business School alums make up 26%; Wharton alums, 11%; and Chicago alums, 7% of all PE firm professionals. See “Harvard, 4 Other Schools, Make Up Most MBAs at PE & VC Firms,” <http://blog.pitchbook.com/harvard-4-other-schools-make-up-most-mbas-at-pe-vc-firms/>

4. Financial engineering

This section explores how PE firms state that they employ different components of financial engineering.

4.1. Valuation: capital budgeting

In this subsection, we consider how PE investors value the companies in which they invest or, equivalently, evaluate the attractiveness of those investments. A substantial corporate finance literature has developed around capital budgeting. Firms decide which projects to undertake based upon a variety of investment rules. Much of the early finance research established that optimal decision making for firms should be based on net present value analyses.⁶ Finance theory is clear that estimating expected future cash flows from an investment, then using a discount rate that is derived from an explicit asset pricing model (e.g., CAPM or Fama and French three-factor model) should lead to better investment decisions when compared with alternatives such as internal rate of return or payback analysis (e.g., multiple on invested capital). The theory, therefore, predicts or suggests that private equity investors should be more likely to use discounted cash flow methods. Our results allow us to explore how investment decision-making criteria at PE firms compares with the framework implied by finance theory.

⁶ For example, see Brealey, Myers, and Allen (2013).

Table 5

Deal evaluation metrics and methods.

Panel A presents the percentage of deals for which the sample private equity (PE) investors use different methods to evaluate an investment. Panel B provides the average ranking of different methods that the sample PE investors use to evaluate an investment, where 10 is the highest and 1 is the lowest. The sample is divided into subgroups based on the median of assets under management (AUM), the internal rate of return (IRR) of most recent fund, the age of PE investor, and by whether PE investor has a global presence. Statistical significance of the difference between subgroup means at the 1%, 5%, and 10% levels are denoted by ***, **, and *, respectively. DCF=discounted cash flow; WACC=weighted average cost of capital; EBITDA=earnings before interest, taxes, depreciation, and amortization.

Metric/method	Mean	Median	AUM		IRR		Age		Offices	
			Low	High	Low	High	Old	Young	Local	Global
<i>Panel A: Deal evaluation metrics</i>										
Gross IRR	92.7	100.0	88.5	97.0	99.9	96.9	100.0	86.4**	94.2	90.5
Multiple of invested capital	94.8	100.0	92.1	97.7	99.1	93.3	96.1	93.7	95.5	93.8
Adjusted present value (APV) DCF	9.3	0.0	7.1	11.5	9.3	7.3	3.9	13.9	10.5	7.6
WACC-based DCF	10.9	0.0	9.3	12.5	5.5	15.2	8.9	12.5	9.4	12.9
Comparable company EBITDA multiples	71.7	100.0	71.4	72.1	63.0	90.7**	75.9	68.1	76.7	64.8
Free cash flow return to equity	43.8	33.0	29.7	58.3***	45.2	43.7	44.4	43.2	40.7	48.1
Other	13.8	0.0	10.3	17.4	7.0	21.7	12.1	15.3	8.3	21.4
Number of responses	67	67	34	33	25	23	31	36	39	28
<i>Panel B: Deal evaluation methods</i>										
Accounting rate of return	0.6	0.0	0.9	0.2	0.7	0.7	0.5	0.7	0.6	0.5
Adjusted present value	0.9	0.0	0.6	1.2	0.6	0.8	0.5	1.3	0.8	1.0
Discounted payback period	1.7	0.0	1.7	1.6	1.3	1.3	1.3	1.9	1.9	1.3
Earnings multiple approach	6.1	8.0	6.0	6.1	5.5	6.2	5.4	6.7	6.1	6.1
Hurdle rate	3.6	0.0	3.7	3.5	4.4	2.0**	3.4	3.8	3.7	3.5
Internal rate of return	9.2	10.0	9.0	9.4	9.8	9.1	9.5	9.0	8.9	9.6
Net present value	2.8	0.0	2.1	3.4	3.7	2.0	2.5	3.0	2.4	3.3
Payback period	2.4	0.0	2.4	2.4	2.1	2.1	2.5	2.3	2.8	1.7
Profitability index	0.9	0.0	1.0	0.8	0.8	0.3	0.3	1.5**	0.5	1.4
Other	2.1	0.0	2.5	1.6	2.2	2.8	2.3	1.9	1.9	2.3
Number of responses	67	67	34	33	25	23	31	36	39	28

4.1.1. Valuation: evaluation methods

The survey asks the PE investors to identify different methods they use to evaluate the overall attractiveness of a deal. First, we asked which metrics they use, giving them the choice of gross internal rate of return, multiple of invested capital, adjusted present value (APV) discounted cash flow (DCF), weighted average costs of capital (WACC) DCF, comparable company EBITDA (earnings before interest, taxes, depreciation, and amortization) multiples, and free cash flow return to equity. Panel A of Table 5 reports the results. The vast majority of the PE investors rely on gross IRR and MOIC. Over 70% also incorporate comparable company multiples. In contrast, relatively few PE investors use DCF methods. In sum, less than 20% use APV or WACC-based DCF methods to evaluate investments. Second, we asked the PE investors to rank their reliance on the different methods. Again, as Panel B of Table 5 indicates, IRR (in particular) and multiple approaches are the overwhelming favorites while net and adjusted present value approaches lag far behind.

We also directly asked private equity managers how they calculate their WACC. Only 18 (or 27%) of the PE investors describe performing a calculation that can be generously considered to approximate a traditional, CAPM-based approach. At the same time, 27 said they did not use WACC and another 10 said “not applicable,” indicating, that they, too, do not use WACC. Overall, then, at least 55% of the PE investors appear not to use WACC at all.

These results indicate that PE investors do not frequently use net present value or DCF techniques. This con-

trasts markedly with the results in [Graham and Harvey \(2001\)](#) for CFOs. They find that CFOs rely on net present value techniques roughly as frequently as IRR and that large company CFOs rely heavily on the CAPM to determine their cost of capital.

Our results for PE investors also contrast with the methods taught in MBA finance courses at all top business schools as well as typical valuation analyses seen in investment banker fairness opinions for mergers and acquisitions. CAPM-based discounted cash flow analyses are the primary method taught and used in those settings.

Finally, in their IRR calculation, the PE investors clearly evaluate cash flows to leveraged equity. Arguably, this, too, contrasts with the usual academic advice in MBA finance courses to evaluate and discount cash flows to an all-equity firm. This also raises questions as to whether limited partners understand the returns are leveraged.

4.1.2. Years of forecasts

In evaluating any investment, investors typically forecast the cash flows of that investment over some period of time. We asked the PE investors to tell us the time horizon of the investment cash flows they evaluate. Fig. 1 indicates that the great majority of PE investors, almost 96% of our sample, use a five-year forecast horizon. At the end of the five years, they typically calculate a terminal or exit value. This indicates that PE investors do not find it productive or valuable to forecast cash flows for more than five years.

[Graham and Harvey \(2001\)](#) do not appear to have asked this question so we cannot compare our results with theirs. While we did not explicitly ask why PE firms use five years

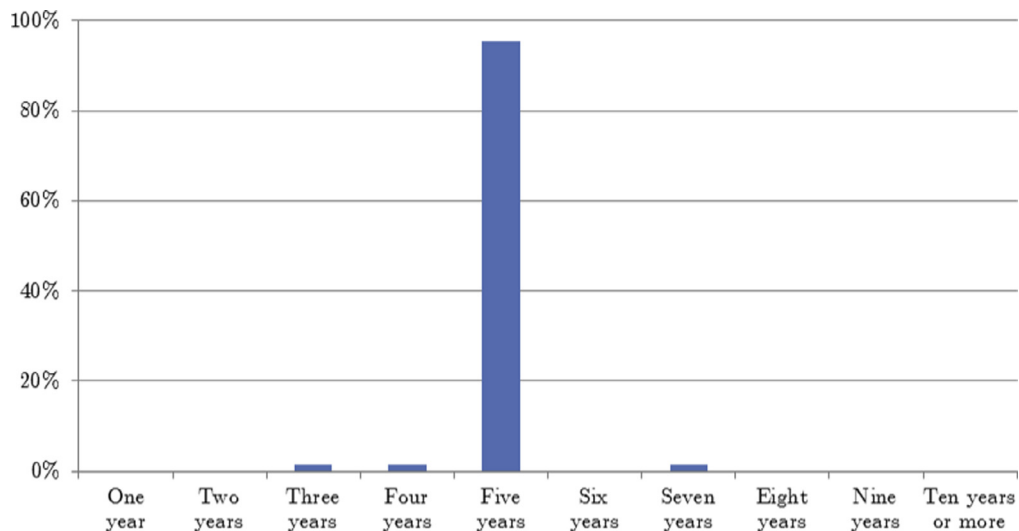


Fig. 1. Years of forecasts used by the sample private equity investors.

Table 6

Discount to management EBITDA forecasts.

This table reports the discount that the sample private equity (PE) investors normally apply to management EBITDA (earnings before interest, taxes, depreciation, and amortization) forecasts in their pro forma models. The sample is divided into subgroups based on the median of assets under management (AUM), the internal rate of return (IRR) of most recent fund, the age of PE investor, and by whether PE investor has a global presence.

	Mean	Median	AUM		IRR		Age		Offices	
			Low	High	Low	High	Old	Young	Local	Global
Discount to management EBITDA	0.25	0.20	0.27	0.21	0.26	0.25	0.21	0.28	0.25	0.25
Number of responses	44	44	27	17	15	14	20	24	29	15

as the predominant forecasting horizon, most PE firms expect to hold their investments for approximately five years. As such, forecasting cash flows over five years approximates the PE firm's time horizon. Several investors have told us that using a standard time period, such as five years, allows the PE firms to compare different investments on an equal footing. That explains why each firm would use a standard horizon, but not why almost all firms would use the same five-year horizon.

4.1.3. Discount to management forecasts

When PE investors evaluate an investment, they usually begin with a set of management forecasts. It seems natural to assume that the PE investors would view those forecasts as optimistic. Accordingly, we asked the PE investors whether they typically adjusted management's forecasts. We asked them to measure this as a fraction of EBITDA, a measure of pre-tax cash flow.

Table 6 shows that PE investors typically discount management forecasts. For the 44 PE investors who answered this question explicitly, the average and median discounts are 25% and 20%, respectively. Another 11 of the PE investors who did not provide a number indicated that the discount varied with the circumstances of individual deals.

4.1.4. Exit value or terminal value

To evaluate the economics of an investment, the PE investors need to estimate a value for their investment (or,

equivalently the portfolio company) at the expected time of exit, which is almost always five years into the investment. This valuation can be done in (at least) three ways: (1) using the (discounted) value of a growing perpetuity of the final year cash flow in a CAPM framework, (2) using the value of comparable or similar public companies, and (3) using the value of acquisitions or transactions involving comparable or similar companies.

Panel A of Table 7 indicates that PE investors are much more likely to use comparable methods—both publicly traded companies and transactions—than discounted cash flow methods. Fewer than 30% of the PE investors use a growing perpetuity methodology. The percentage increases for larger PE firms, but remains below 35%. The other category is dominated by 11 firms (or 16%) indicating that they use the entry multiple (the EBITDA multiple the PE investor paid for the company) to calculate the exit multiple.

Panel B explores how the PE investors choose the comparable companies they use. Industry and firm size are the most important criteria they match on, with growth, margins, and geography next in importance. Setting the exit multiple equal to the entry multiple is also consistent with matching on firm industry and size. Firm riskiness ranks seventh among the different criteria. Again, PE investors appear to be skeptical of using measures of risk that have strong foundations in academic finance.

Table 7

Terminal value calculation and comparable company selection.

Panel A reports the fraction of deals for which the sample private equity (PE) investors use different methods to calculate the exit value or terminal value of the model. Panel B shows the determinants of the selection that the sample PE investors use for comparable companies for multiples valuation or exit value. The sample is divided into subgroups based on the median of assets under management (AUM), the internal rate of return (IRR) of most recent fund, the age of PE investor, and by whether PE investor has a global presence. Statistical significance of the difference between subgroup means at the 1%, 5%, and 10% levels are denoted by ***, **, and *, respectively. DCF=discounted cash flow.

	Mean	Median	AUM		IRR		Age		Offices	
			Low	High	Low	High	Old	Young	Local	Global
<i>Panel A: Terminal value calculation</i>										
Comparable companies	81.4	100.0	75.3	87.7	81.3	88.6	87.3	76.3	78.2	85.8
Comparable transactions	71.4	99.0	67.8	75.0	73.2	80.3	79.5	64.4	76.1	64.8
DCF-based growing perpetuity	27.3	10.0	20.5	34.3	28.1	16.4	26.6	27.9	21.0	36.0
Other	25.6	0.0	33.5	17.4	20.7	31.1	22.8	27.9	28.7	21.3
Number of responses	67	67	34	33	25	23	31	36	39	28
<i>Panel B: Comparable company selection</i>										
Industry	96.9		96.9	97.0	95.8	100.0	100.0	94.1	94.6	100.0
Riskiness	49.2		34.4	63.6**	54.2	56.5	45.2	52.9	48.6	50.0
Size	84.6		87.5	81.8	87.5	87.0	90.3	79.4	86.5	82.1
Growth	73.8		75.0	72.7	79.2	69.6	77.4	70.6	75.7	71.4
Margins	66.2		59.4	72.7	83.3	65.2	67.7	64.7	62.2	71.4
Capital intensity	52.3		31.3	72.7***	62.5	52.2	51.6	52.9	51.4	53.6
Geography	56.9		43.8	69.7**	58.3	69.6	67.7	47.1	48.6	67.9
Other	4.6		6.3	3.0	4.2	8.7	3.2	5.9	8.1	0.0
Do not use comparables	3.1		3.1	3.0	4.2	0.0	0.0	5.9	5.4	0.0
Number of responses	65		32	33	24	23	31	34	37	28

4.1.5. IRR and MOIC targets

PE investors do not explicitly use DCF or CAPM-based methods. Given their emphasis on IRR and MOIC, however, it is important to know what IRR and MOIC PE investors target and whether those targets bear any relation to CAPM-based returns.

Panel A of [Table 8](#) indicates that PE investors say they target median IRRs of 25%. Smaller PE firms and those with global investment operations tend to target higher IRRs. A rough calculation suggests that this target exceeds a CAPM-based rate. In 2012, long-term Treasury bond rates did not exceed 4%. [Axelson, Sorensen, and Strömberg \(2013\)](#) estimate an average portfolio company equity beta of 2.3. Assuming an equity risk premium of 6%, these suggest a CAPM-based discount rate of less than 18%.

The fact that PE investors target returns exceed CAPM-based discount rates is not surprising. PE investors pay their fees out of gross IRRs. PE limited partners receive their returns net of those fees. In other words, to generate a competitive CAPM-based return net of fees, PE investors must target a greater return gross of fees. Similarly, many PE firms argue that they generate returns in excess of the underlying riskiness of the portfolio. To earn positive excess returns, the PE firms would need to target returns that are higher than the return implied by the CAPM risk of the investment.

We also asked two questions to determine whether PE investors adjusted their target IRR to reflect different risks in different deals. These are presented in Panels B and C of [Table 8](#). Panel B indicates that over 85% of PE investors adjust their target IRRs for firm riskiness. While most PE investors explicitly do not use a CAPM-based approach, this adjustment could be consistent with one. Unfortunately, the survey did not explicitly define firm risk. As a result, we cannot distinguish the extent to which firm risk refers to systematic or idiosyncratic risk.

Panel B indicates that less than half of the PE investors adjust their target IRRs for deal leverage. This suggests that the more than half of the PE investors who do not make such an adjustment explicitly do not take a CAPM-based approach.

Panel C reports the fraction of deals that PE investors adjust cash flows or the IRR to reflect different risks. These risks can be divided into macroeconomic or systematic risks (unexpected inflation, interest rate, term structure, business cycle, and foreign exchange) and firm-specific risks (distress, size, market-to-book, momentum, and illiquidity). The results indicate that PE investors are somewhat sensitive to macroeconomic risks, particularly gross domestic product (GDP) or business cycle risk in which PE investors make some adjustment in roughly half of their deals. This is consistent with PE investors taking market or equity risk into account. This is also suggestive of PE investors having time varying hurdle rates. Firm-specific adjustments appear less important, although some of the PE firms use a variety of firm-specific factors to adjust their target hurdle rates.

[Table 9](#) indicates that PE investors say they target median MOICs of 2.5 times their investment. At a five-year time horizon, this implies a gross IRR of approximately 20%. The mean MOIC of 2.85 times implies a gross IRR of 23%. The MOIC targets, therefore, imply slightly lower gross IRRs than reported gross IRR targets. Smaller and younger private equity firms generally tend to have higher MOIC targets.

4.1.6. Net of fee targets (marketed to LPs)

We ask private equity investors not only about the targets they use to evaluate their investments, but also how their limited partners evaluate the performance of the private equity investors. Benchmarking of private equity

Table 8

Internal rate of return (IRR) target, determinants, and adjustments.

Panel A reports the target value of gross IRR used by the sample private equity (PE) investors. Panel B describes the variables that the sample PE investors use to adjust their gross IRR target. Panel C reports the fraction of deals for which the sample PE investors adjust cash flows or the IRR to reflect different risks. The sample is divided into subgroups based on the median of assets under management (AUM), the IRR of most recent fund, the age of PE investor, and by whether PE investor has a global presence. Statistical significance of the difference between subgroup means at the 1%, 5%, and 10% levels are denoted by ***, **, and *, respectively. LPs=limited partners; GDP=gross domestic product.

Variables	Mean	Median	AUM		IRR		Age		Offices	
			Low	High	Low	High	Old	Young	Local	Global
<i>Panel A: IRR</i>										
Gross IRR target	27.0	25.0	30.0	24.1**	24.5	24.9	24.8	29.3	25.7	28.9
Number of responses	62	62	31	31	24	22	31	31	36	26
<i>Panel B: IRR determinants</i>										
Firm's riskiness	86.2		84.4	87.9	91.7	91.3	90.3	82.4	91.9	78.6
Leverage	47.7		40.6	54.5	58.3	52.2	51.6	44.1	54.1	39.3
Historical return expectations of LPs	30.8		40.6	21.2	20.8	30.4	22.6	38.2	37.8	21.4
Other	9.2		6.3	12.1	8.3	17.4	16.1	2.9	10.8	7.1
Not applicable	4.6		6.3	3.0	0.0	0.0	0.0	8.8	2.7	7.1
Number of responses	65		32	33	24	23	31	34	37	28
<i>Panel C: Adjustments to the cash flows or the IRR</i>										
Risk of unexpected inflation	17.7	0.0	8.2	26.9**	26.0	13.9	21.2	14.5	12.2	25.0
Interest rate risk	25.5	2.0	22.6	28.3	33.5	26.5	26.3	24.8	26.3	24.5
Term structure risk	18.5	0.0	16.6	20.3	14.9	26.9	22.9	14.4	13.5	25.0
GDP or business cycle risk	55.0	50.0	47.8	61.9	63.6	55.7	59.4	51.0	54.2	56.0
Commodity price risk	28.8	21.0	22.8	34.7	35.5	27.1	30.6	27.2	28.0	29.9
Foreign exchange risk	20.2	10.0	15.7	24.5	25.6	16.6	23.5	17.1	12.9	29.8***
Distress risk	13.0	0.0	8.7	17.2	13.8	11.9	17.2	9.1	9.0	18.2
Size	28.6	10.0	31.8	25.5	25.1	25.5	22.9	33.8	31.1	25.3
Market-to-book ratio	7.5	0.0	5.3	9.6	9.3	5.6	7.4	7.6	6.6	8.6
Momentum	11.8	0.0	9.6	13.9	17.0	10.3	18.9	5.4**	12.9	10.4
Illiquidity	20.3	0.0	22.2	18.5	19.8	6.8	15.2	25.0	15.8	26.3
Other	1.4	0.0	2.8	0.0	0.0	0.0	0.0	2.6	2.4	0.0
Number of responses	65	65	32	33	24	23	31	34	37	28

Table 9

Multiple of invested capital (MOIC).

This table measures the value of gross MOIC targeted by the sample private equity (PE) investors. The sample is divided into subgroups based on the median of assets under management (AUM), the internal rate of return (IRR) of most recent fund, the age of PE investor, and by whether PE investor has a global presence. Statistical significance of the difference between subgroup means at the 1%, 5%, and 10% levels are denoted by ***, **, and *, respectively.

	Mean	Median	AUM		IRR		Age		Offices	
			Low	High	Low	High	Old	Young	Local	Global
Multiple of invested capital	2.85	2.50	3.16	2.54**	2.51	2.56	2.50	3.14**	2.98	2.67
Number of responses	62	62	31	31	24	21	28	34	36	26

returns has seen significant evolution in recent years both from an academic and from a data vendor perspective.

Table 10 reports the benchmark that the PE investors say is most important for their LPs. Surprisingly, almost two-thirds of the PE investors report that an absolute measure of performance, net IRR and net MOIC, is most important. In less than 8% of the cases do the PE investors believe that LPs view performance relative to public markets as the most important performance benchmark. This is surprising given the large attention paid to alphas and relative performance in public market investments such as mutual funds and hedge funds. An additional 27% believe the performance relative to other PE investors is most important. The only difference among private equity firm types appears to be that older private equity firms' investors evaluate net IRR relative to fund vintage year more frequently and younger private equity firms' investors look to cash-on-cash multiples. Overall, the focus on absolute performance is notable and surprising given the intense fo-

cus on relative performance or alphas for public market investments.

In their survey, Da Rin and Phalippou (2014) also find that LPs place a great emphasis on IRRs and MOICs in evaluating PE funds and firms. Unfortunately, Da Rin and Phalippou do not clearly distinguish between relative and absolute performance.

Table 11 reports the net IRR that the PE investors market to their LPs. The median net IRR is between 20% and 25%. Consistent with the PE investors' gross IRR targets, this would correspond to a gross IRR of between 25% and 30%. And as with the gross IRR targets, these net IRR targets seem to exceed what one would expect in a CAPM-based framework.

4.1.7. Discussion

These somewhat surprising valuation results raise several potential alternative explanations. First, because private equity is viewed by many limited partners [and

Table 10

Benchmark for limited partners (LPs).

This table reports the most important benchmark for the LPs investing in the sample private equity (PE) investors. Net indicates net of all fees. The sample is divided into subgroups based on the median of assets under management (AUM), the internal rate of return (IRR) of most recent fund, the age of PE investor, and by whether PE investor has a global presence. Statistical significance of the difference between subgroup means at the 1%, 5%, and 10% levels are denoted by ***, **, and *, respectively. S&P=Standard & Poor's; GPs=general partners.

Benchmark	Mean	AUM		IRR		Age		Offices	
		Low	High	Low	High	Old	Young	Local	Global
Net IRR	25.4	29.0	21.9	27.3	21.7	26.7	24.2	22.2	29.6
Net IRR versus S&P 500	7.9	6.5	9.4	9.1	4.3	10.0	6.1	8.3	7.4
Net IRR with respect to fund vintage year	27.0	19.4	34.4	27.3	43.5	40.0	15.2**	33.3	18.5
Net multiple or cash-on-cash IRR of other GPs	38.1	45.2	31.3	31.8	30.4	20.0	54.5***	33.3	44.4
IRR of other GPs	1.6	0.0	3.1	4.5	0.0	3.3	0.0	2.8	0.0
Number of responses	63	31	32	22	23	30	33	36	27

Table 11

Net internal rate of return (IRR) marketed to limited partners (LPs).

This table describes the typical IRR that the sample private equity (PE) investors market to their LPs. The sample is divided into subgroups based on the median of assets under management (AUM), the IRR of most recent fund, the age of PE investor, and by whether PE investor has a global presence.

Marketed IRR	Mean	AUM		IRR		Age		Offices	
		Low	High	Low	High	Old	Young	Local	Global
0–5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5–10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10–15%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15–20%	15.6	18.8	12.5	13.0	13.0	23.3	8.8	18.9	11.1
20–25%	50.0	40.6	59.4	65.2	47.8	53.3	47.1	45.9	55.6
25–30%	23.4	25.0	21.9	21.7	30.4	20.0	26.5	24.3	22.2
> 30%	10.9	15.6	6.3	0.0	8.7	3.3	17.6	10.8	11.1
Number of responses	64	32	32	23	23	30	34	37	27

marketed as such by some general partners (GPs)] as an absolute return investment, nominal hurdle rates could be more meaningful than discounted cash flow valuation based upon CAPM discount rates. Because underlying portfolio companies were typically only periodically revalued (if at all) in the past, private equity fund returns may not be risk-adjusted by limited partners in a traditional sense. Alternatively, private equity investors may be skeptical of asset pricing models that seek to measure risk. As such, far more of their energy is focused on estimating reasonable cash flows.

Our analysis of the factors that affect private equity firm hurdle rates also indicates a deviation from what is typically recommended in finance research and teaching. It suggests that while PE investors do not use a CAPM-based framework, they do use what appears to be an ad hoc multi-factor framework. Some of the underlying ad hoc factors appear related to systematic risk and others relate to non-systematic risk, i.e., it appears that many private equity firms care about the total risk of the investment when determining the hurdle rates. This would be consistent with the lack of risk-adjusting investment returns on the part of limited partners. If that is the case, then private equity managers would care about adjusting the hurdle rates for both types of risk. Similarly, the diversity of criteria factored into a PE firm's gross IRR target means that unlike a CAPM-based discount rate, which would be the same across different private equity firms, PE firm hurdle rates are likely to vary significantly for similar investments and are likely to be PE firm-, time period-, and portfolio company-specific.

Our results concerning exit multiples being based on comparable companies suggests that PE investors are somewhat skeptical of CAPM-based methods for valuing companies relative to the use of multiples-based approaches. This is at odds with methods taught in basic finance courses in which terminal or exit values are calculated using growing perpetuity formulas with comparable companies' methods possibly used as a check on the CAPM-based approach.

The IRR analysis also embeds the action plan of the private equity firm. Typical holding periods for investments are centered around five years (the typical projection length), and exit values are determined by industry multiples (what they hope to sell the company for at exit). As such, the effort put into the typical IRR model helps private equity firms manage their portfolio more than DCF does. In essence, the framework of investment evaluation can be tied to the investment fund structure that imposes limited holding periods and less transparency on underlying valuation movements, i.e., systematic risk.

4.2. Capital structure

As [Graham and Harvey \(2001\)](#), among others, note, a long-standing question in corporate finance is whether firms have a target capital structure that is determined by a trade-off between the costs and benefits of taking on debt. Among the most taught factors that finance educators argue should influence optimal debt levels is the trade-off theory in which managers set debt levels to balance the tax benefit of interest deductibility and disciplin-

Table 12

Capital structure at closing.

This table reports the typical capital structure at closing for the sample private equity (PE) investor portfolio companies measured as debt-to-total capital and debt-to-EBITDA (earnings before interest, taxes, depreciation, and amortization). The sample is divided into subgroups based on the median of assets under management (AUM), the internal rate of return (IRR) of most recent fund, the age of PE investor, and by whether PE investor has a global presence. Statistical significance of the difference between subgroup means at the 1%, 5%, and 10% levels are denoted by ***, **, and *, respectively.

Capital structure measure	Mean	Median	AUM		IRR		Age		Offices	
			Low	High	Low	High	Old	Young	Local	Global
Debt-to-capital (percent)	55.7	60.0	54.3	57.2	56.6	56.9	55.0	56.4	55.0	56.8
Number of responses	62	62	31	31	22	23	30	32	37	25
Debt-to-EBITDA ratio	3.9	4.0	3.6	4.2**	4.1	4.2	4.2	3.6**	3.8	4.1
Number of responses	60	60	31	29	22	21	29	31	36	24

ing of management with the expected costs of financial distress. The costs of distress include the inability to invest in valuable future projects, retain customers, or retain employees because of cash constraints or questions about long-term viability. In their survey, Graham and Harvey find some support for the trade-off theory (as well as some support for pecking order theory). They also find that CFOs place their greatest focus on retaining financial flexibility and a good credit rating.

AJSW (2013) contrast the trade-off theory of capital structure with a market timing view. From their perspective, the trade-off theory implies that industry factors play an important role in optimal capital structure because industries vary in cash flow volatility (affecting the probability of distress and agency costs) as well as investment opportunities and tangibility (affecting the costs of distress). They argue that buyout firm leverage thus should be related to the leverage of public companies in the same industry. In the market timing view, in contrast, leverage and capital structure respond to economy-wide debt market conditions. When interest rates are low, firms tend to raise more debt. When equity prices are high, firms raise capital by issuing more equity. For a large sample of buyouts, they do not find any support for the trade-off theories. Buyout capital structures are not related to capital structures of similar public companies. Instead, consistent with market timing, leverage is highly related to economy-wide debt market conditions.

4.2.1. Survey results

In our survey, we asked the PE investors how they determine the initial capital structure of their portfolio companies. We included both trade-off- and market timing-related factors. Table 12 reports the typical capital structure that PE investors target at closing. They target a median debt-to-total capital of 60% and a median debt-to-EBITDA ratio of 4.0 times. Some observers believe these ratios are surprisingly low. They are much lower than the ratios that were common in the 1980s. They also are somewhat lower than the median ratios of 70% and 5.2 times, respectively, in AJSW (2013).

Two likely reasons explain why these survey ratios are lower. First, we conducted our survey in 2012, a year in which debt ratios and debt availability were lower than the historical average. Second, a number of the investors in our survey invest in growth equity as well as buyouts. As their

name suggests, growth equity investments are likely to use less leverage than buyouts.

We also find that larger and older private equity investors tend to target more levered capital structures. This is perhaps not surprising given that larger private equity firms target investments in larger companies that can sustain greater leverage.

The survey asks what factors the PE investors consider in determining capital structure. The trade-off theory suggests a role for firm industry, tax benefits, default risk and the ability to generate operating improvements or reduce agency costs. Panels A and B of Table 13 present the key results. Panel A reports whether the PE investors consider a particular factor, and Panel B reports the rankings of those factors (where 6 is the top or highest rank). Both Panels A and B suggest that the trade-off theory and market timing are equally important. Almost all of the PE investors consider both industry factors and current interest rates in determining capital structure. These two rank well above the others in importance. Roughly two-thirds of the PE investors explicitly think about the trade-off between tax benefits and default risk, and the same percentage also say they raise as much debt as the market will bear. These factors tie for third in importance. Just under 40% consider the ability of debt to force operational improvements in the manner suggested by Jensen (1989). Finally, only six firms, or less than 10%, mention financial flexibility as an important determinant of capital structure. This contrasts sharply with the strong emphasis on financial flexibility among CFOs in Graham and Harvey (2001).

4.2.2. Discussion

Our market timing result is very consistent with the result in AJSW (2013). Although we did not confirm this explicitly, the result to “use as much debt as the market will allow” also is consistent with the result in AJSW that the availability of leverage affects the pricing of a deal and, possibly, the decision to do one.

Our finding that PE investors do consider trade-off-related factors is not. The question is how can the PE investor and AJSW results be reconciled? One possible explanation is that it is very difficult for outside observers to measure optimal capital structure. It is unlikely that all public companies in the same industry have the same optimal capital structure, and it also is unlikely that all public

Table 13

Capital structure factors considered important and ranked.

Panel A reports the factors that the sample private equity (PE) investors consider in determining how much debt to raise for a transaction. Panel B reports the ranking of factors that the sample PE investors consider important in determining how much debt to raise for a transaction. A higher number means it is a more important factor with 6 being the highest rank. The sample is divided into subgroups based on the median of assets under management (AUM), the internal rate of return (IRR) of most recent fund, the age of PE investor, and by whether PE investor has a global presence. Statistical significance of the difference between subgroup means at the 1%, 5%, and 10% levels are denoted by ***, **, and *, respectively.

	Mean	Median	AUM		IRR		Age		Offices	
			Low	High	Low	High	Old	Young	Local	Global
<i>Panel A: Capital structure factors – important</i>										
Ability of debt to force operational improvements	39.1		31.3	46.9	39.1	30.4	33.3	44.1	29.7	51.9
Use as much debt as the market will allow	65.6		65.6	65.6	65.2	69.6	73.3	58.8	62.2	70.4
Current interest rates and how much the company can pay	95.3		93.8	96.9	95.7	95.7	96.7	94.1	97.3	92.6
Industry that the firm operates in	96.9		93.8	100.0	95.7	95.7	93.3	100.0	97.3	96.3
Maximize trade-off between tax benefits and risk of default	67.2		59.4	75.0	65.2	78.3	66.7	67.6	64.9	70.4
Other	35.9		40.6	31.3	17.4	52.2**	36.7	35.3	43.2	25.9
Number of responses	64		32	32	23	23	30	34	37	27
<i>Panel B: Capital structure factors – rank</i>										
Ability of debt to force operational improvements	1.3	0.0	1.1	1.6	1.0	1.2	1.1	1.5	0.9	1.9**
Use as much debt as the market will allow	2.5	3.0	2.5	2.5	2.5	2.7	2.8	2.3	2.5	2.6
Current interest rates and how much the company can pay	5.0	5.0	4.7	5.3	5.1	4.9	5.0	4.9	4.9	5.0
Industry that the firm operates in	4.5	5.0	4.4	4.5	4.7	4.0	4.3	4.6	4.5	4.4
Maximize trade-off between tax benefits and risk of default	2.5	3.0	2.4	2.7	2.7	2.7	2.5	2.6	2.5	2.5
Other	1.8	0.0	2.1	1.4	0.8	2.7**	1.8	1.8	2.1	1.3
Number of responses	64	64	32	32	23	23	30	34	37	27

companies are optimizing. In addition, the companies that PE investors select to invest in are likely to be those that were not optimizing and for whom there is room for improvement. Both of these factors will introduce noise into the tests conducted by AJSW.

Another possibility is that the PE investors answered yes to the trade-off theory simply because they consider taxes and financial distress to be important, albeit not explicitly for capital structure. We think this is less likely given the fact that they did rank the trade-off in a tie for third, suggesting it matters.

The fact that most private equity firms do not consider financial flexibility when setting capital structure is potentially explained by the private equity firm's ability to inject capital in the future. Because most private equity firms own the company and have access to inside information, less asymmetric information exists that would create an equity financing constraint. The private equity firms typically have existing funds with undrawn capital and can always invest additional equity. In fact, we often see such follow-on equity investments in situations in which portfolio companies make roll-up acquisitions. In these settings, the typical concern about financial flexibility that was identified in [Graham and Harvey \(2001\)](#) would be less of a concern.

Overall, the survey indicates that PE investors consider both trade-off and market timing theories. This is arguably favorable both to the traditional instruction at business schools and to the more recent advances in behavioral finance.

4.3. Incentives

Management incentives are supposedly an important piece of financial and governance engineering. [Table 14](#) is consistent with this. It confirms previous work by [Kaplan \(1989\)](#), [Kaplan and Strömberg \(2009\)](#), and [Acharya, Gottschalg, Hahn, and Kehoe \(2013\)](#) that PE investors provide strong incentives to portfolio company management. On average, PE investors allocate 17% of company equity to management and employees. The CEO obtains an average of 8%. The percentages are slightly lower, at 15% and 6%, respectively, for the larger PE investors who invest in larger companies. This is significantly higher than equity ownership of senior management in public companies. For example, [Page \(2011\)](#) finds that the average CEO of a public company between 1993 and 2007 held 3.58% of the company's equity and the median CEO held only 1.57%.

5. Governance engineering

In this section, we consider PE investors' attitudes toward corporate governance. First, we consider the structure of the boards of directors of their portfolio companies. Second, we consider their attitudes toward monitoring, hiring, and firing top management.

Panel A of [Table 15](#) confirms previous work in showing that PE investors prefer small boards of directors with more than 90% including between five and seven members. Larger private equity firms tend to have portfolio companies with larger boards. Panel B indicates that PE investors

Table 14

Typical equity ownership.

This table reports the typical equity ownership of the sample private equity (PE) investors, the chief executive officer (CEO), and top management. The sample is divided into subgroups based on the median of assets under management (AUM), the internal rate of return (IRR) of most recent fund, the age of PE investor, and by whether PE investor has a global presence. Statistical significance of the difference between subgroup means at the 1%, 5%, and 10% levels are denoted by ***, **, and *, respectively.

	Mean	Median	AUM		IRR		Age		Offices	
			Low	High	Low	High	Old	Young	Local	Global
PE investors	79.6	85.0	74.9	84.3**	82.7	83.6	82.9	76.6	81.2	77.3
CEO	8.0	5.0	10.0	6.0	7.1	6.1	7.8	8.2	6.9	9.5
Top ten management (excluding CEO)	7.2	7.0	8.1	6.3**	7.1	6.9	7.0	7.3	7.6	6.6
Other employees	1.8	0.0	1.1	2.4	3.0	0.9	1.7	1.8	1.3	2.5
Other	3.5	0.0	6.0	1.1**	0.1	2.6	0.6	6.1**	3.0	4.3
Number of responses	64	64	32	32	23	23	30	34	37	27

Table 15

Board of directors' size and composition.

Panel A presents the desired size of board of directors reported by the sample private equity (PE) investors. Panel B presents the desired composition of the board of directors by the sample PE investors. The sample is divided into subgroups based on the median of assets under management (AUM), the internal rate of return (IRR) of most recent fund, the age of PE investor, and by whether PE investor has a global presence. Statistical significance of the difference between subgroup means at the 1%, 5%, and 10% levels are denoted by ***, **, and *, respectively.

	Mean	Median	AUM		IRR		Age		Offices	
			Low	High	Low	High	Old	Young	Local	Global
<i>Panel A: Board of directors' size</i>										
3 or less	3.1		3.1	3.1	8.7	0.0	3.3	2.9	0.0	7.4
4	1.6		3.1	0.0	0.0	4.3	0.0	2.9	2.7	0.0
5	32.8		40.6	25.0	21.7	30.4	23.3	41.2	37.8	25.9
6	10.9		12.5	9.4	21.7	8.7	20.0	2.9**	10.8	11.1
7	46.9		37.5	56.3	39.1	52.2	46.7	47.1	43.2	51.9
8	3.1		0.0	6.3	8.7	0.0	3.3	2.9	2.7	3.7
9	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	1.6		3.1	0.0	0.0	4.3	3.3	0.0	2.7	0.0
11 or more	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Number of responses	64		32	32	23	23	30	34	37	27
<i>Panel B: Board of directors' composition</i>										
Inside directors	1.6	1.0	1.6	1.5	1.4	1.5	1.5	1.6	1.5	1.7
PE directors	2.8	3.0	2.7	2.9	2.8	2.9	2.8	2.7	2.7	2.8
Outside directors	1.7	2.0	1.6	1.9	1.9	1.7	1.9	1.6	1.8	1.6
Other	0.1	0.0	0.1	0.1	0.0	0.2	0.1	0.1	0.1	0.1
Number of responses	64	64	32	32	23	23	30	34	37	27

Table 16

Private equity (PE) involvement in portfolio companies.

This table reports the fraction of deals in which the sample PE investors become involved in the management of portfolio companies, i.e., actively advising the company on strategic choices. The sample is divided into subgroups based on the median of assets under management (AUM), the internal rate of return (IRR) of most recent fund, the age of PE investor, and by whether PE investor has a global presence.

Active involvement	Mean	Median	AUM		IRR		Age		Offices	
			Low	High	Low	High	Old	Young	Local	Global
Percent of deals	87.5	100.0	84.8	90.1	81.3	90.2	85.2	89.5	83.0	93.6
Number of responses	64	64	32	32	23	23	30	34	37	27

take roughly three of the board seats while allocating one or two to management and one or two to outsiders who are not affiliated with the PE firms. Again, the results for board composition are consistent with previous work and with conventional wisdom.

Table 16 indicates that PE investors are actively involved in advising their companies in the great majority of their deals. In fact, the median PE investor claims to be actively involved in all of his or her deals. Again, it would be surprising if we found otherwise.

Tables 17 and 18 explore how active the PE investors are in recruiting senior management teams in their portfolio companies. Table 17 indicates that the majority of PE investors, almost 70%, invest in the existing management team. They do not recruit their own senior management team before the investment. This is consistent with the notion that many private equity firms want to be seen as remaining friendly when pursuing transactions. Management is often critical to successfully executing transactions.

Table 17

Private equity (PE) recruitment of management teams.

This table reports the percentage of the sample PE investors who recruit their own senior management teams before investing, after investing, and before or after investing. The sample is divided into subgroups based on the median of assets under management (AUM), the internal rate of return (IRR) of most recent fund, the age of PE investor, and by whether PE investor has a global presence. Statistical significance of the difference between subgroup means at the 1%, 5%, and 10% levels are denoted by ***, **, and *, respectively.

Senior management recruitment	Mean	AUM		IRR		Age		Offices	
		Low	High	Low	High	Old	Young	Local	Global
Before investing									
Yes	31.3	31.3	31.3	26.1	39.1	30.0	32.4	29.7	33.3
No	68.8	68.8	68.8	73.9	60.9	70.0	67.6	70.3	66.7
After investing									
Yes	50.0	40.6	59.4	43.5	52.2	50.0	50.0	37.8	66.7**
No	50.0	59.4	40.6	56.5	47.8	50.0	50.0	62.2	33.3**
Before or after investing									
Yes	57.8	53.1	62.5	47.8	63.4	56.7	58.1	48.6	70.4*
No	42.2	46.9	37.5	52.2	36.6	43.3	41.9	51.4	29.6*
Number of responses	64	32	32	23	23	30	34	37	27

Table 18

Private equity (PE) replacement of chief executive officers (CEOs) after investing.

This table reports the percentage of deals in which the sample PE investors replace the CEO after the investment is made. The sample is divided into subgroups based on the median of assets under management (AUM), the internal rate of return (IRR) of most recent fund, the age of PE investor, and by whether PE investor has a global presence.

CEO replaced	Mean	Median	AUM		IRR		Age		Offices	
			Low	High	Low	High	Old	Young	Local	Global
Percent of deals	33.3	30.0	30.3	36.3	27.9	37.3	27.7	38.2	32.0	35.0
Number of responses	64	64	32	32	23	23	30	34	37	27

At the same time, however, a meaningful fraction of PE investors, 31%, do recruit their own senior management teams before investing. This suggests that different PE investors have very different investment strategies. It also suggests that the PE investors who bring in their own team do not place a great deal of weight on the value of incumbency.

After the investment, roughly 50% of the PE investors end up recruiting their own senior management team. This is consistent with some of the PE investors becoming more actively involved in the governance of their companies after the investment. When we combine the PE investors who recruit their own teams before, or after, or both before and after investing, we find that almost 58% of the PE investors recruit their own senior teams. Again, this suggests that the PE investors are actively involved in monitoring and governing their portfolio companies.

Although ascribing any causality at this point is not possible, the cross-sectional results suggest that the PE investors who recruit their own teams have experienced better past investment performance. Similarly, larger and global private equity firms are more likely to recruit their own management teams at some point.

6. Operational engineering and value creation

In this section, we explore the ways in which the PE investors attempt to create value for their investments and add value to their portfolio companies.

6.1. Deal sourcing

PE investors claim that an important determinant of value creation is the ability to find or source deals that are proprietary in some sense. Accordingly, we asked several questions concerning deal sourcing. Table 19 reports the deal funnel experience of our PE investors. For every hundred opportunities considered, the average PE investor deeply investigates 15, signs an agreement with about eight, and closes on fewer than four. This suggests that PE investors devote considerable resources to evaluating transactions despite the fact that they ultimately invest in only a very few. When we compare the deal funnel at different types of private equity firms, larger and older private equity firms pass a greater fraction of their deals through to the next stage. There are three explanations for this result. First, larger and older private equity firms could just have higher quality initial deal sourcing and, hence, do not need to weed out as many deals at all stages. Second, larger firms could have more resources available, so they do not have to eliminate possible deals so quickly. Third, the larger fund sizes could reduce the stringency of the deal funnel. It also appears, without attributing causality, that better performing PE investors are more selective in the deal consideration process.

Table 20 considers the source and proprietary nature of the deals that the PE investor actually closed. According to the PE investors, almost 36% of their closed deals are proactively self-generated, 7.4% are provided by man-

Table 19

Deal funnel.

This table reports the percentage of opportunities considered by the sample private equity (PE) investors that reach different investment stages. The sample is divided into subgroups based on the median of assets under management (AUM), the internal rate of return (IRR) of most recent fund, the age of PE investor, and by whether PE investor has a global presence. Statistical significance of the difference between subgroup means at the 1%, 5%, and 10% levels are denoted by ***, **, and *, respectively. LOI=letter of intent.

	Mean	Median	AUM		IRR		Age		Offices	
			Low	High	Low	High	Old	Young	Local	Global
All considered opportunities	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Deep due diligence	15.1	12.0	12.7	17.4*	17.6	13.7	16.5	13.9	14.5	15.9
Offer term sheet or negotiate detailed terms	12.9	10.0	11.4	14.4	14.6	12.1	13.2	12.6	12.5	3.4
Sign LOI	8.2	5.0	6.8	9.6	9.0	7.0	8.5	7.9	6.2	10.9**
Close	3.6	3.0	3.0	4.1*	4.1	2.9	3.7	3.5	3.0	4.3*
Number of responses	71	71	35	36	26	26	33	38	41	30

Table 20

Deal sources.

This table reports the percentage of the sample private equity (PE) investors who closed deals they identify from different sources and the percentage of closed deals the sample PE investors consider proprietary. The sample is divided into subgroups based on the median of assets under management (AUM), the internal rate of return (IRR) of most recent fund, the age of PE investor, and by whether PE investor has a global presence. Statistical significance of the difference between subgroup means at the 1%, 5%, and 10% levels are denoted by ***, **, and *, respectively. LPs=limited partners.

Deal source	Mean	Median	AUM		IRR		Age		Offices	
			Low	High	Low	High	Old	Young	Local	Global
Proactively self-generated	35.6	30.0	37.7	33.5	39.3	35.5	35.8	35.4	35.3	35.9
Investment bank-generated	33.3	25.0	30.5	36.0	33.0	37.0	38.2	29.1	33.0	33.7
Inbound from management	7.4	5.0	5.8	8.9	6.1	9.0	7.4	7.3	7.2	7.6
Other PE firm	4.3	0.0	5.4	3.3	4.1	2.2	4.1	4.5	5.0	3.5
Deal brokers	8.6	0.0	9.5	7.7	6.8	7.1	8.4	8.7	8.7	8.5
Executive network	8.6	5.0	8.3	9.0	8.8	8.5	4.6	12.1***	9.1	8.0
LPs or investors	1.7	0.0	2.5	0.9	0.6	0.7	0.4	2.7	1.2	2.3
Conferences	0.6	0.0	0.3	0.9	1.0	0.3	1.1	0.3	0.5	0.8
Other	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.0
Percent of closed deals considered proprietary	47.9	50.0	54.0	41.9**	48.0	43.9	41.5	53.4	47.6	48.3
Number of responses	71	71	35	36	26	26	33	38	41	30

agement, and 8.6% come from their executive network. These arguably have the potential to be proprietary. In contrast, 33% are investment banking generated, 8.6% come from deal brokers, and 4.3% come from other PE firms. These are unlikely to be proprietary. Smaller and younger private equity firms generally tend to source more proprietary deals. This likely reflects smaller target deal sizes. Firms that invest in large and mega deals are less likely to be able to generate proprietary deals given that their targets are probably more likely to be sold in an auction process. Finally, younger private equity firms tend to utilize their executive networks more frequently.

When asked to summarize these sources, the PE investors considered almost 48% of their closed deals to be proprietary in some way. Unfortunately, we have no way of evaluating exactly what proprietary means and we cannot validate the extent to which the deals truly are proprietary or advantaged.

Nevertheless, we think these results indicate that the PE investors explicitly consider the extent to which their potential investments are proprietary and attempt to invest in deals that are.

6.2. Deal selection

To better understand how PE investors select and differentiate among investments, we asked them to rank the factors they considered in choosing their investments where 6 is the highest rank. Table 21 reports these results. The most important factor in choosing an investment is the business model or competitive position of the company. The management team, the PE investor's ability to add value, and the valuation are the three next most important factors and are roughly of equal importance. The industry or market of the company and the fit with the PE investor's fund are of least importance.

Two of these results are notable. First, the PE investors put somewhat more weight on the business than on the management team. This result is consistent with the work of Kaplan, Sensoy, and Strömberg (2009) showing that, at least within the venture capital world, the business strategies of firms remain far more stable (and hence are more important) than the stability of management. Second, the importance of the ability to add value suggests that PE investors take operational engineering and adding value seriously. This also suggests that different private equity firms are likely to target and value investments differently.

Table 21

Deal selection.

This table reports the ranking of factors considered by the sample private equity (PE) investors in choosing investments (where 6 is the highest rank). The sample is divided into subgroups based on the median of assets under management (AUM), the internal rate of return (IRR) of most recent fund, the age of PE investor, and by whether PE investor has a global presence. Statistical significance of the difference between subgroup means at the 1%, 5%, and 10% levels are denoted by ***, **, and *, respectively.

Deal selection factor	Mean	Median	AUM		IRR		Age		Offices	
			Low	High	Low	High	Old	Young	Local	Global
Ability to add value	3.6	3.0	3.6	3.6	3.9	3.5	3.5	3.7	3.5	3.8
Business model or competitive position	4.6	5.0	4.5	4.7	4.5	4.5	4.4	4.7	4.6	4.5
Fit with fund	2.3	2.0	2.7	1.9	2.0	2.2	2.2	2.4	2.5	2.0
Industry or market	3.2	3.0	3.4	3.0	3.3	3.0	3.3	3.1	3.5	2.8
Management team	3.8	4.0	3.7	4.0	3.9	4.0	4.1	3.6	3.8	3.8
Valuation	3.5	3.0	3.2	3.8	3.4	3.8	3.5	3.5	3.0	4.1***
Number of responses	65	65	32	33	24	23	31	34	37	28

Table 22

Return driver importance and ranking.

Panel A reports the percentage of the sample private equity (PE) investors who mention different return drivers that they bet on in making investments. Panel B reports the return drivers that the sample PE investors bet on in making investments ranked in order of importance where 6 is the highest rank. The sample is divided into subgroups based on the median of assets under management (AUM), the internal rate of return (IRR) of most recent fund, the age of PE investor, and by whether PE investor has a global presence. Statistical significance of the difference between subgroup means at the 1%, 5%, and 10% levels are denoted by ***, **, and *, respectively.

	Mean	Median	AUM		IRR		Age		Offices	
			Low	High	Low	High	Old	Young	Local	Global
<i>Panel A: Return driver – important</i>										
Growth in the value of the underlying business	100.0		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Industry-level multiple arbitrage	64.8		74.3	55.6	50.0	65.4	66.7	63.2	61.0	70.0
Leverage	76.1		68.6	83.3	65.4	88.5**	81.8	71.1	73.2	80.0
Operational improvements	97.2		94.3	100.0	100.0	96.2	100.0	94.7	95.1	100.0
Refinancing	36.6		28.6	44.4	34.6	42.3	45.5	28.9	29.3	46.7
Other	26.8		28.6	25.0	23.1	19.2	21.2	31.6	31.7	20.0
Number of responses	71		35	36	26	26	33	38	41	30
<i>Panel B: Return driver – rank</i>										
Growth in the value of the underlying business	5.7	6.0	5.8	5.7	5.9	5.5**	5.7	5.7	5.8	5.6
Industry-level multiple arbitrage	2.4	3.0	2.8	2.1	1.9	2.4	2.3	2.6	2.1	2.9
Leverage	2.6	3.0	2.4	2.8	2.3	3.2	3.0	2.2**	2.5	2.7
Operational improvements	4.6	5.0	4.5	4.7	4.9	4.6	4.7	4.5	4.5	4.7
Refinancing	1.0	0.0	0.8	1.3	0.9	1.3	1.2	0.9	0.9	1.2
Other	1.1	0.0	1.2	1.0	0.7	0.8	0.8	1.3	1.3	0.8
Number of responses	71	71	35	36	26	26	33	38	41	30

Private equity firms often have particular industry experience and focus. A successful track record in a particular industry is likely to lead to greater investment focus on a particular sector.

The survey asked the selection question in another way by inquiring about the drivers of return PE investors anticipate when making investments where 6 is, again, the highest rank. Panel A of Table 22 reports the percentage of PE investors who view a return driver as important, and Panel B of Table 22 reports the ranking of those return drivers.

Growth in the value of the underlying business is mentioned as a return driver by 100% of the PE investors and is the highest ranked return driver. Operational improvements are close behind, ranked second and mentioned by 97% of the PE investors. Leverage and industry-level multi-

ple arbitrage—selling at a higher multiple than buying—are mentioned by 76% and 65% but rank well behind growth and operational improvements. These results suggest that PE investors invest with the expectation or hope of growing the value of the business and improving operations. Leverage as well as buying low and selling high are viewed as less important.

Once again, these views can be a reflection of the current private equity environment. Historical leverage ratios (in the 1980s and 1990s) were substantially higher than they are today for the typical private equity deal. Also, the growth in the number of private equity firms and capital under management means that there is likely more competition for deals and, hence, less ability to buy companies at a cheap price.

Table 23

Pre-investment (expected) sources of value creation.

This table describes the percentage of deals that the sample private equity (PE) investors identify having specified pre-deal sources of value. The sample is divided into subgroups based on the median of assets under management (AUM), the internal rate of return (IRR) of most recent fund, the age of PE investor, and by whether PE investor has a global presence. Statistical significance of the difference between subgroup means at the 1%, 5%, and 10% levels are denoted by ***, **, and *, respectively. IT=information technology; CEO=chief executive officer; CFO=chief financial officer.

Sources of value	Mean	Median	AUM		IRR		Age		Offices	
			Low	High	Low	High	Old	Young	Local	Global
Reduce costs in general	35.6	27.5	35.8	35.5	37.1	37.3	39.9	32.0	31.0	41.8
Improve IT or information systems	26.1	20.0	30.8	21.6	22.0	23.3	23.9	28.0	26.7	25.3
Introduce shared services	15.6	2.5	16.4	14.9	11.6	18.3	16.9	14.6	14.9	16.6
Increase revenue or improve demand factors	70.3	80.0	77.5	63.5**	75.0	63.5	67.0	73.2	70.6	70.0
Redefine the current business model or strategy	33.8	29.5	27.8	39.5	43.0	29.8	32.1	35.3	32.8	35.2
Change CEO or CFO	30.6	27.5	33.4	28.0	29.2	32.9	30.9	30.4	29.3	32.4
Change senior management team other than CEO and CFO	33.4	30.0	37.3	29.7	32.5	33.1	27.9	38.1	35.4	30.8
Improve corporate governance	47.0	37.0	52.4	41.9	40.1	45.5	39.4	53.5	47.3	46.6
Improve incentives	61.1	73.5	60.7	61.5	58.3	67.0	65.5	57.4	59.0	63.9
Follow-on acquisitions	51.1	50.0	53.9	48.4	52.0	46.9	51.0	51.2	53.2	48.3
Strategic investor	15.6	10.0	16.4	14.8	12.3	14.0	14.4	16.5	15.1	16.2
Facilitate a high-value exit	50.0	43.5	61.0	39.6**	45.6	42.0	40.4	58.1**	53.5	45.4
Purchase at an attractive price (buy low)	44.3	43.0	49.2	39.6	38.2	43.3	40.9	47.1	44.9	43.5
Purchase at an attractive price relative to the industry	46.6	50.0	54.5	39.2**	38.7	47.3	42.9	49.8	50.1	42.0
Other	9.8	0.0	9.4	10.2	0.0	14.3**	9.4	10.1	12.4	6.4
Number of responses	74	74	36	38	27	27	34	40	42	32

6.3. Value creation

Given the emphasis on growing the value of the business, our next questions asked the PE investors to identify the sources of that value creation. We asked them to distinguish between expected sources of value creation identified before the deal is closed, pre-deal, and actual sources of value creation, post-deal, or after the investment is made.

6.3.1. Pre-investment

Table 23 lists the pre-investment expected sources of value creation. Each deal has a large number of sources of value. Hence, the total expected sources of value add up to well over 100% indicating that PE investors rely on several sources of value creation. The most frequently mentioned source of value is increasing revenue, identified by PE investors as being important in over 70% of their deals. Smaller private equity firms identified increasing revenue more often than larger private equity investors. This is not surprising given that there may be more room to increase revenues for the smaller deals targeted by smaller private equity investors. Follow-on acquisitions are also important in more than 50% of their deals. Reducing costs is identified as being important in only 36% of their deals. Introducing shared services, in which the PE investors help their several portfolio companies aggregate demand for services or supplies to improve their bargaining power with suppliers, is also related to reduced costs and is important in 16% of the deals.

Both increasing sales and reducing costs would fit under operational engineering. If these answers are accurate (see Section 7), growth is more important than reducing

costs, suggesting a shift in emphasis from the cost cutting and agency cost reduction in the 1980s as emphasized in Jensen (1989). The presence of merger and acquisition activity may have led many firms to be more efficient on the cost side, i.e., there may be less corporate waste today than in the past (Kaplan, 1997).

Private equity investors also expect to create value in roughly one-third of their investments by redefining or changing the company's strategy or business model. In roughly one-third of their investments, they expect to create value by changing the CEO or CFO and by changing other members of the senior management team. All of these also would fit under the rubric of operational engineering. Presumably these actions, if successful, would lead to greater growth, reduced costs, or both. Private equity investors also expect to create value by improving incentives (61%) and improving corporate governance (47%). These would fit under the categories of financial and governance engineering discussed in Sections 4 and 5.

In slightly under half of their investments, private equity investors expect they are able to buy at attractive prices, both absolutely (44.3%) and relative to the industry (46.6%). In roughly half of their investments, they also expect that they can facilitate a high value exit. This suggests that private equity investors believe they create a meaningful amount of value by being able to buy low and sell high. For smaller and younger private equity firms, the ability to engage in multiple expansion is higher. This may reflect the greater frequency of proprietary deals for these types of private equity firms and the potential to complete transactions at lower valuations. Among practitioners and limited partners, this would usually be considered a type of financial engineering, particularly buying low. From an

Table 24

Pre-investment value creators.

This table reports the percentage of deals that each specified group actively participates in identifying pre-deal value for the sample private equity (PE) investors. The sample is divided into subgroups based on the median of assets under management (AUM), the internal rate of return (IRR) of most recent fund, the age of PE investor, and by whether PE investor has a global presence. Statistical significance of the difference between subgroup means at the 1%, 5%, and 10% levels are denoted by ***, **, and *, respectively.

Participants	Mean	Median	AUM		IRR		Age		Offices	
			Low	High	Low	High	Old	Young	Local	Global
Deal team	97.7	100.0	96.9	98.4	97.7	99.2	98.4	97.0	97.9	97.4
Operating partners	45.3	40.5	44.9	45.7	46.9	46.3	40.5	49.4	41.6	50.2
Outside consultants	36.8	26.5	27.9	45.1**	35.0	45.3	42.1	32.2	35.0	39.0
Other	7.2	0.0	8.9	5.5	5.1	5.2	4.1	9.8	8.8	5.0
Number of responses	74	74	36	38	27	27	34	40	42	32

academic perspective, this is difficult to characterize. It is potentially consistent with taking advantage of asymmetric information, superior bargaining ability, market timing, and an efficient allocation of resources (i.e., selling to the right buyer).

We can say that, overall, the answers indicate that PE investors expect to create value pre-investment from a combination of financial, governance, and operational engineering. Different private equity firms typically express different value drivers. Private equity firms appear to engage in differentiated investment strategies with different sources of expected value creation.

We also asked the PE investors who in their organization is involved in identifying the (pre-investment) sources of value creation. Table 24 indicates that deal team members (i.e., the financial partners) are involved in virtually every deal. Perhaps the more interesting result is that operating partners, i.e., those primarily with operating instead of financial experience, are involved in identifying value sources in 45% of the deals. In addition to relying on operating partners, Table 24 indicates that the PE investors involve outside consultants in almost 37% of their deals. Smaller and younger private equity firms are less likely to engage outside consultants in their transactions. Overall, then, Table 24 suggests that the PE investors have made a meaningful investment in operational engineering although that investment is highly variable across firms.

6.3.2. Post-investment

Table 25 lists post-investment realized sources of value creation. The third column reports the difference in the mean result for pre- and post-investment for each variable. The same sources identified as important pre-investment remain important post-investment except that many of them increase in importance.

Increased revenue remains important in roughly 70% of the deals. Reduced costs increase in importance, rising to 47% of deals, but remain below increased growth. The use of shared services, redefining the strategy, changing the CEO or CFO, and changing other members of the senior management team also increase by 6% to 14% relative to the pre-deal expected sources of value. If anything, then, operational engineering sources of value appear to be more important post-investment than they are identified as or expected to be pre-investment. Improving incentives and improving corporate governance also remain

important sources of value, increasing by 4% and 5%, respectively, relative to pre-investment expectations.

Facilitating a high-value exit also becomes somewhat more important with almost 60% of the PE investors citing this as a post-investment source of value. This could reflect the historical perspective of private equity firms that were able to take more proprietary deals public or sell at a higher valuation.

Post-investment, then, the PE investors continue to claim they create value from a combination of financial, governance, and operational engineering. Overall, the post-investment sources of value they realize are somewhat greater than the sources of value identified pre-deal.

We again asked the PE investors who in their organization is involved in identifying the (post-investment) sources of value creation. Table 26 indicates that the participants are similar to those involved pre-investment. Deal team members are involved in virtually every deal. Operating partners are involved in identifying value sources in 51% of the deals, slightly higher than the 45% pre-deal, and consultants are involved in 27%, somewhat less than the 37% pre-deal.

6.4. Exit

Our final questions relating to value creation concern the exit strategy of PE investors. Table 27 indicates that PE investors expect to exit roughly one-half of their deals through a sale to a strategic buyer, i.e., to an operating company in a similar or related industry. In almost 30% of deals, they expect to sell to a financial buyer, i.e., to another private equity investor. In less than 20% of deals, PE investors expect to exit through an initial public offering (IPO). These percentages are consistent with, in fact almost identical to, the exit results in Strömberg (2008) that 53% of deals with known exits are to strategic buyers, 30% are to financial buyers, and 17% are through IPOs. Not surprisingly, a significant difference exists between larger and smaller PE investors. Larger PE investors expect to exit through an IPO more than 26% of the time, and smaller PE investors expect to do so less than 11% of the time. For the largest deals, it is less likely that many strategic buyers are large enough to sell to.

Panels A and B of Table 28, respectively, tabulate the presence and the ranking of factors that PE investors consider in deciding when to exit (where 7 is the highest

Table 25

Post-investment sources of value creation.

This table reports the percentage of deals that the sample private equity investors identify as having specified post-deal sources of value and the difference from pre-deal sources of value from Table 23. The sample is divided into subgroups based on the median of assets under management (AUM), the internal rate of return (IRR) of most recent fund, the age of PE investor, and by whether PE investor has a global presence. Statistical significance of the difference between subgroup means at the 1%, 5%, and 10% levels are denoted by ***, **, and *, respectively. IT=information technology; CEO=chief executive officer; CFO=chief financial officer.

Sources of value	Mean	Median	Δ from pre-deal	AUM		IRR		Age		Offices	
				Low	High	Low	High	Old	Young	Local	Global
Reduce costs in general	47.4	48.5	11.7	46.1	48.5	46.5	51.2	52.1	43.3	40.2	56.8**
Improve IT or information systems	33.5	28.0	7.4	36.4	30.6	29.7	35.3	31.0	35.5	32.8	34.3
Introduce shares services	21.9	10.0	6.3	18.5	25.2	21.9	24.0	23.9	20.3	18.8	26.1
Increase revenue or improve demand factors	69.5	71.0	-0.8	73.9	65.3	70.7	68.8	67.2	71.4	69.4	69.6
Redefine the current business model or strategy	40.1	40.0	6.3	34.2	45.7**	52.1	35.0**	39.3	40.8	39.7	40.7
Change CEO or CFO	42.9	40.0	12.3	40.5	45.3	46.3	43.8	44.1	42.0	40.6	46.0
Change senior management team other than CEO and CFO	47.1	50.0	13.7	46.2	48.0	44.1	52.6	46.7	47.4	48.2	45.7
Improve corporate governance	52.1	50.0	5.1	56.2	48.2	51.0	52.1	49.9	54.0	53.6	50.1
Improve incentives	65.1	71.5	3.9	58.3	71.5	70.3	72.3	72.3	59.0	60.5	71.1
Make follow-on acquisitions	48.1	50.0	-3.0	45.1	50.8	47.8	46.7	50.4	46.1	50.7	44.6
Bring on a strategic investor	13.5	10.0	2.1	14.5	12.5	14.1	10.1	13.3	13.6	15.4	10.9
Facilitate a high-value exit	58.8	60.0	8.8	62.7	55.0	55.6	53.6	55.9	61.2	62.8	53.5
Other	7.1	0.0	7.1	8.3	5.9	0.0	7.1	5.6	8.3	9.1	4.3
Number of responses	74	74	74	36	38	27	27	34	40	42	32

Table 26

Post-investment value creators.

This table reports the percentage of deals that each specified group actively participates in identifying post-deal value. The sample is divided into subgroups based on the median of assets under management (AUM), the internal rate of return (IRR) of most recent fund, the age of private equity (PE) investor, and by whether PE investor has a global presence.

Participants	Mean	Median	AUM		IRR		Age		Offices	
			Low	High	Low	High	Old	Young	Local	Global
Deal team	93.3	100.0	90.6	95.9	93.7	95.6	93.5	93.2	92.1	94.9
Operating partners	51.1	50.0	46.8	55.1	56.2	48.5	45.7	55.6	43.6	60.9
Outside consultants	27.1	21.0	22.0	31.9	26.2	34.0	29.3	25.2	25.2	29.5
Other	8.6	0.0	13.0	4.3	3.7	7.9	5.6	11.1	9.2	7.7
Number of responses	74	74	36	38	27	27	34	40	42	32

Table 27

Types of exit.

This table reports the fraction of deals the sample private equity (PE) investors target for different types of exit. The sample is divided into subgroups based on the median of assets under management (AUM), the internal rate of return (IRR) of most recent fund, the age of PE investor, and by whether PE investor has a global presence. Statistical significance of the difference between subgroup means at the 1%, 5%, and 10% levels are denoted by ***, **, and *, respectively. IPO=initial public offering.

Type of exit	Mean	Median	AUM		IRR		Age		Offices	
			Low	High	Low	High	Old	Young	Local	Global
IPO	18.8	11.7	10.9	26.4***	23.7	18.9	20.6	17.2	12.1	27.7***
Strategic sale	51.0	50.0	57.3	44.8**	46.3	51.4	44.2	56.7**	57.5	42.3***
Financial sale	29.5	30.0	31.8	27.3	29.6	28.1	33.6	26.0	30.4	28.3
Other	0.7	0.0	0.0	1.5	0.5	1.6	1.6	0.0	0.0	1.7
Number of responses	63	63	31	32	22	23	29	34	36	27

rank). We are interested in whether private equity firms believe that they can time the exit markets (either IPO or mergers and acquisitions markets) or if exits are driven by firm-specific performance. Achieving the expected operational plan and capital market conditions are the most important and are ranked roughly equally. They are important for more than 90% of the PE investors. As with capital structure decisions, this suggests that PE investors put

roughly equal weight on fundamentals and on market timing. Management's opinion, competitive considerations and hitting a return target are the next most important considerations and are ranked roughly equally. They are considered by more than 75% of the PE investors. Considering management's opinion is consistent with a cooperative or advisory relation between PE investors and management. The requirement to hit a return target could indicate an

Table 28

Exit timing, importance and rank.

Panel A describes the factors the sample private equity (PE) investors consider in deciding on the timing of exit. Panel B describes the ranking of factors the sample PE investors consider in deciding on the timing of exit (where higher rank is more important and 7 is the highest rank). The sample is divided into subgroups based on the median of assets under management (AUM), the internal rate of return (IRR) of most recent fund, the age of PE investor, and by whether PE investor has a global presence. Statistical significance of the difference between subgroup means at the 1%, 5%, and 10% levels are denoted by ***, **, and *, respectively. ROI=return on investment; LPs=limited partners.

Factors	Mean	Median	AUM		IRR		Age		Offices	
			Low	High	Low	High	Old	Young	Local	Global
<i>Panel A: Exit timing – important</i>										
Achieve operational plan set out to achieve	92.2		90.6	93.8	95.7	91.3	90.0	94.1	91.9	92.6
Capital market conditions	96.9		96.9	96.9	100.0	95.7	100.0	94.1	94.6	100.0
Competitive considerations	76.6		75.0	78.1	69.6	78.3	80.0	73.5	83.8	66.7
Hit IRR or ROI target	79.7		71.9	87.5	91.3	82.6	76.7	82.4	75.7	85.2
LPs pressure to return capital	56.3		46.9	65.6	56.5	56.5	43.3	67.6	48.6	66.7
Management's opinion	85.9		81.3	90.6	87.0	82.6	86.7	85.3	86.5	85.2
Other	14.1		15.6	12.5	13.0	13.0	13.3	14.7	10.8	18.5
Number of responses	64		32	32	23	23	30	34	37	27
<i>Panel B: Exit timing – rank</i>										
Achieve operational plan set out to achieve	5.5	6.0	5.4	5.5	5.8	5.3	5.3	5.6	5.5	5.4
Capital market conditions	5.3	5.5	5.4	5.2	5.3	5.3	5.4	5.2	5.0	5.7
Competitive considerations	3.5	4.0	3.5	3.5	3.2	3.1	3.4	3.5	3.9	2.9
Hit IRR or ROI target	4.0	4.0	3.9	4.2	4.2	4.6	3.8	4.3	3.9	4.3
LPs pressure to return capital	1.8	1.5	1.5	2.0	1.9	1.8	1.4	2.1	1.6	1.9
Management's opinion	3.7	4.0	3.4	4.1	3.8	3.7	4.3	3.2**	3.8	3.7
Other	0.7	0.0	0.7	0.7	0.7	0.7	0.6	0.7	0.5	0.9
Number of responses	64	64	32	32	23	23	30	34	37	27

Table 29

Private equity (PE) firm organization.

This table describes how the sample PE investors say their firm is organized. The sample is divided into subgroups based on the median of assets under management (AUM), the internal rate of return (IRR) of most recent fund, the age of PE investor, and by whether PE investor has a global presence. Statistical significance of the difference between subgroup means at the 1%, 5%, and 10% levels are denoted by ***, **, and *, respectively.

Firm organization	Mean	AUM		IRR		Age		Offices	
		Low	High	Low	High	Old	Young	Local	Global
Industry	54.4	54.1	54.8	65.5	55.2	64.7	46.7	54.5	54.3
Criteria	11.4	10.8	11.9	13.8	3.4	11.8	11.1	6.8	17.1
Product	16.5	5.4	26.2**	17.2	17.2	29.4	6.7***	2.3	34.3***
Generalist	36.7	40.5	33.3	27.6	34.5	26.5	44.4	43.2	28.6
Other	6.3	2.7	9.5	10.3	6.9	8.8	4.4	2.3	11.4
Number of responses	79	37	42	29	29	34	45	44	35

agency problem between the PE investors and their limited partners in which the private equity firm's limited partners cannot adjust investment performance for risk and, hence, the private equity managers maintain nominal return thresholds.

7. Private equity firm organization

Up until this point, the survey questions have asked the PE investors to describe what they do with respect to their portfolio company investments. In this section, we report the answers to questions about the organization of the PE firms themselves with the idea of shedding additional light on how they operate and attempt to create value. Historically, private equity firms were small organizations. Since 2000, private equity firms have grown substantially in terms of both employees and structure. We seek to understand how this growth translates into organizational choices.

In Table 29, we report how the PE firms are organized. The notable result here is that only 37% of the PE investors are organized as generalists. This is very different from the organization of the PE firms in the 1980s when most firms and most individual PE investors were largely generalists. At the same time, more than 50% of the firms are organized by industry. Organization by industry likely carries three advantages: PE investors who specialize in an industry are more likely to be able to find an opportunity in that industry, to be able to evaluate the opportunity when it appears, and to understand whether and how it is possible to add value to that opportunity.

In Table 30, we report the percentage of investment professionals in different specializations. A majority of employees in our sample firms are deal professionals. An additional 20% can be considered deal-related because they are involved in deal sourcing and deal execution, bringing to almost 75% the percentage of employees who are deal oriented. At the same time, 8.7% of employees

Table 30

Private equity (PE) firm investment professionals.

This table reports the percentage of investment professionals in different specializations in the sample PE investor firms. The sample is divided into subgroups based on the median of assets under management (AUM), the internal rate of return (IRR) of most recent fund, the age of PE investor, and by whether PE investor has a global presence. Statistical significance of the difference between subgroup means at the 1%, 5%, and 10% levels are denoted by ***, **, and *, respectively. HR=human resources.

Professionals by specialization	Mean	Median	AUM		IRR		Age		Offices	
			Low	High	Low	High	Old	Young	Local	Global
Deal professionals	54.2	50.0	57.7	51.2	55.1	59.2	59.3	50.4	58.7	48.6
Deal sourcing professionals	8.9	1.3	11.5	6.5	9.8	3.5**	6.0	11.1	9.8	7.7
Deal execution professionals	9.6	0.0	10.0	9.2	10.4	4.4	5.8	12.4**	11.5	7.2
Operating professionals	8.7	4.3	8.9	8.4	9.8	6.4	7.2	9.8	7.0	10.7
Consulting professionals	1.2	0.0	1.1	1.2	0.8	0.7	0.9	1.3	1.2	1.1
Shared services professionals	5.7	0.0	3.3	7.8	5.3	7.9	6.2	5.4	3.1	8.9**
Fundraising professionals	3.2	1.2	1.6	4.6***	4.0	2.6	2.9	3.4	1.7	5.1***
HR professionals for portfolio companies	0.4	0.0	0.4	0.3	0.2	0.3	0.2	0.5	0.2	0.6
Capital markets professionals	1.8	0.0	0.9	2.5	1.0	2.7	2.9	0.9	0.3	3.6**
Other	6.5	0.0	4.7	8.1	3.6	12.4	8.6	4.9	6.7	6.3
Number of responses	79	79	37	42	29	29	34	45	44	35

Table 31

Operational engineering assistance.

This table reports the percentage of the sample private equity (PE) investors who utilize a non-limited partner advisory board, senior advisors, or a chief executive officer (CEO) council or hire strategy consultants. The sample is divided into subgroups based on the median of assets under management (AUM), the internal rate of return (IRR) of most recent fund, the age of PE investor, and by whether PE investor has a global presence. Statistical significance of the difference between subgroup means at the 1%, 5%, and 10% levels are denoted by ***, **, and *, respectively. LP=limited partner.

	Mean	AUM		IRR		Age		Offices	
		Low	High	Low	High	Old	Young	Local	Global
Non-LP advisory board or group of advisors	38.0	32.4	42.9	27.6	48.3	38.2	37.8	47.7	25.7**
Senior advisors or CEO council or equivalent	48.1	35.1	59.5**	51.7	62.1	52.9	44.4	47.7	48.6
Hire strategy consultants to help with operating plans	31.6	18.9	42.9**	41.4	34.5	41.2	24.4	27.3	37.1
Number of responses	79	37	42	29	29	34	45	44	35

are operating professionals, 1.2% are consulting professionals, 5.7% are shared service professionals, and 0.4% are human resources professionals, for a total of 16% who can be considered exclusively concerned with operational engineering. While this percentage is much lower than the percentage of employees who are deal-oriented, it does indicate that meaningful employee resources are devoted to value creation.

Table 31 considers the extent to which PE investors make use of other advisers to help with deal sourcing and with value creation. Almost 50% of the PE investors utilize senior advisers, a CEO council, or its equivalent. In general, these advisers provide nonfinancial advice on businesses. Almost 40% of the PE investors have an advisory board of such advisers. When we put these together, almost 66% of the PE investors have an advisory board or utilize senior advisers. The PE investors describe these advisers or executives as helping with deal flow, assisting with investment due diligence, providing industry-specific information, serving on boards post-investment, and advising on operating and managerial issues post-investment. Consistent with the earlier evidence on operational engineering, this suggests that many of the PE investors have made meaningful investments in obtaining operating advice.

Almost 32% of the PE investors hire strategy consultants to help with operating plans. When we combine these with the senior advisers and CEO councils, we find that 72% of the PE investors employ an advisory board, CEO council, or strategy consultants. Many employ a combination of these. Again, this suggests that many of the PE investors have made meaningful investments in obtaining operating advice. This is perhaps not surprising given the growth and increased competitiveness within the industry and the expected sources of returns.

8. Concerns

In our analyses, we assume that PE investors provide accurate responses. Upon contacting PE firms, we assured them that their responses would be aggregated so that they could not be identified in our analyses. Accordingly, the incentive to report overly positive or otherwise inaccurate responses is arguably low because doing so will not benefit any one individual firm directly. We acknowledge, however, that some PE investors could respond overly positively to some questions in the hope that the PE industry will be cast in a more positive light. In this section, we discuss where we think those incentives and behaviors could affect our results.

Any reporting biases should have a minimal effect on how PE investors report the methods they use to value companies. Whether a PE investor uses net present value or IRR seems uncontroversial. The determinants of target IRR also seem uncontroversial. One area in valuation where some incentive to overstate could exist is on target IRR. PE investors could want their limited partners to believe they are targeting higher IRRs than is the case. The countervailing factor is that if the target IRR is overstated, limited partners ultimately will be disappointed and the ability to continue to raise new (and potentially larger) funds could be reduced.

We also think it unlikely that the PE investors gave biased answers to the questions on capital structure. If anything, one might expect them to understate the extent to which they time the market and use as much leverage as they can. Inconsistent with this, most of the PE investors claim that debt availability and current interest rates are important considerations.

It also seems unlikely that PE investors have an incentive to give biased answers to the questions concerning incentives and boards. Alternatively, one could argue that they have an incentive to downplay the extent to which they replace incumbent management. To the extent that PE investors need to partner with incumbent management, it would not be in their interest to report that they frequently replace incumbents. Inconsistent with this incentive, the majority of PE investors report that they bring in their own top management at some point.

The section in which PE investors could have an incentive to be overly positive is on value creation. To the extent such investors want their LPs to believe that they have access to proprietary deals, PE investors could overstate the extent to which their deals are proprietary. Consistent with this, our PE investors do say that roughly 50% of their investments are proprietary in some way. We do not have any way to evaluate the extent to which this is true. At the same time, however, proprietary deal sourcing suggests that PE investors are able to buy low. One could expect PE investors to have an incentive not to say they can buy low because it does not reflect operating value creation on the part of the PE investors. In fact, the PE investors do identify buying low and selling high as an important source of value.

To the extent that PE investors want to be known for growing their investments (and creating jobs) instead of reducing costs (and cutting jobs), they would have an incentive to overstate the extent to which they rely on growth and understate cost cutting. The result that PE investors identify increasing revenue as the most important source of value both pre- and post-investment is potentially consistent with this. On the other hand, the fact that PE investors identify reducing costs as more important post-investment than pre-investment is less consistent with understating cost cutting. Again, a countervailing force here is that limited partners expect to see growth and look for that value creation.

Overall, then, while the PE investors may have some incentives to shade their survey answers in some areas, particularly regarding deal sourcing and growth, the answers

they provided do not give us strong reasons to believe that they acted consistently on those incentives.

9. Firm types

The previous sections of this paper examined private equity investor practices in financial, governance, and operational engineering. The analyses consider each practice separately. In this section, we examine the extent to which certain practices are correlated across GPs. In doing so, we attempt to measure whether we can classify different groups of GPs as having different strategies. Our approach is to use the grouping of answers for a given private equity firm to extract types through cluster and factor analyses. We then examine how these types map into our notion of operational, financial, and governance engineering. Finally, we look for variation in firm founder backgrounds and how the types are influenced by the career histories of the individuals who started the various private equity organizations.

9.1. Variables

In this subsection, we create a variety of variables that help identify GP practices using measures that embody financial, governance, and operational engineering. To capture difference in investment selection methods, we create a variable that equals one if the GP's primary deal evaluation measure is IRR. We create a measure of proprietary deal sourcing that sums the fraction of deals that GPs say are self-generated, inbound from management, and from their executive network.

We create four capital structure and financial engineering variables that help us characterize the various private equity firms. *CSTIME*, a variable that measures market timing behavior, is calculated as the sum of the rankings GPs give to timing factors—"use as much debt as the market will allow" and "current interest rates and how much the company can pay"—as important determinants of capital structure. Similarly, *CSTRADE* measures capital structure trade-off behavior. It equals the sum of a private equity firm's rankings for "maximize trade-off between tax benefits and risk of default" and "industry that the firm operates in" as important determinants of capital structure. We also create two variables that measure the overall targeted debt levels that the private equity firms say they typically employ. *DTCAP* is simply the typical debt-to-total capital ratio that the private equity manager states they seek, and *DTEB* measures the typical debt-to-EBITDA ratio.

Two variables measure management change that private equity managers engage in both before and after the investment. *RECRUITB* equals one if the GP typically recruits its own senior management team before investing. *RECRUITBA* equals one if the GP recruits its own senior management team before or after investing.

The next set of variables is associated with sources of value that private equity firms say they identify or look to provide. *COSTRED* measures the fraction of deals for which the GP expects prospective cost reductions prior to the investment to be an important source of value. *REVGROW* measures the fraction of deals for which the GP expects

prospective revenue growth prior to the investment to be an important source of value. *CHCEO* is the fraction of deals for which the GP expects that changing the CEO to be an important source of value prior to the investment. *BUY-LOWSELLHI* is a measure of the general partners' belief that they can create value prospectively by purchasing a company at a low price. The variable is calculated as the sum of the fraction of deals a GP expects that buying low, buying low relative to the industry, or facilitating a high-value exit are important sources of value. *OPPART* is simply the fraction of deals that involve operating partners. *PROPDEAL* is the fraction of deals the PE investors claim are proprietary.

We also create variables that measure the factors that GPs find most important in an investment decision. *INVBUS* is the sum of the ranks given to the business model and the industry in an investment decision. *INVMGMT* is the rank given to the management team. *INVADDV* is the rank given to the ability to add value.

Related to these, we create variables that measure the return drivers on which GPs bet. *GROWTH* equals one if the GP's top ranking is growth in the value of the business. *OPIMP* equals one if the GP's top ranking is operating improvements. *MULTARB* equals one if the GP's top ranking is industry level multiple arbitrage.

Some univariate correlations are worth noting (although they are not reported in a table). High debt to total capital and high debt to EBITDA are positively correlated with capital structure timing, cost reductions, and multiple arbitrage and negatively correlated with proprietary deals, revenue growth, and investing in management. Investing in adding value is positively correlated with operating improvements, cost reductions, operating partners, and changing CEOs, but negatively correlated with investing in management. Recruiting a CEO beforehand is correlated with proprietary deals, revenue growth, and buying low and selling high. Finally, proprietary deals use less debt, less market timing, less cost reduction, and more growth.

9.2. Cluster analysis

We first use cluster analysis to divide the firms into groups that allow us to explore how different firm characteristics co-vary. Cluster analysis groups respondents in such a way that the private equity firms within a given cluster are more similar to each other than they are to private equity firms in other clusters. We use partition clustering, which divides "the observations into a distinct number of non-overlapping groups" (kmeans in Stata). We restrict the sample to the 58 firms with complete data responses. We report our results with three clusters. The results are qualitatively similar with four or five clusters.

Table 32 reports the results. The second cluster is characterized in terms of our notions of operational, financial, and governance engineering. The firms in this cluster are more likely to say they choose capital structure using trade-off considerations, are more likely to recruit an outside CEO or change the CEO, are more likely to focus on operating improvements including cost reductions and revenue growth, and are more likely to use operating

partners. Many of these differences are statistically significant (in univariate tests) between Clusters 1 and 2. In sum, Cluster 2 firms seem to say that they focus more heavily on implementing operating improvements and bringing in new management.

Cluster 1 includes firms that say they engage in the most financial engineering and least operational engineering. They are less likely to use capital structure trade-offs; less likely to mention adding value, operating improvements, cost reductions, and operating partners; and are more likely to buy low and sell high. The firms in this cluster also tend to be smaller than those in the other two clusters. Firms in the first cluster also tend to give their management teams a larger equity stake in the business. The third cluster is intermediate between the first two on financial and operational engineering.

9.3. Factor analysis

As an alternative to cluster analysis, we use factor analysis to extract the main dimensions of variation in the characteristics of our sample firms. In factor analysis, one seeks to identify correlations among observed variables in terms of underlying unobserved factors of a smaller dimension. Essentially, factor analysis models the observed variables as a function of the unobserved factors.

Table 33 reports the factor loadings for the first six factors. The first three factors explain almost two-thirds of the variance in the data and have natural interpretations. The first factor has positive loadings on debt levels, operating improvements, cost reductions, operating partners, and adding value and negative loadings on growth, revenue growth, proprietary deal, and investing in the business. As with the cluster analysis, this suggests that some firms focus on operating improvements while others focus on buying good businesses in which they have some proprietary sourcing advantage. The second factor has its highest positive loadings on changing the CEO and recruiting a CEO before the deal closes and negative loadings on investing in management and operating improvements. This suggests a strong tendency for firms to differ in the extent to which they invest in new management versus incumbent. The third factor has high positive loadings on debt levels, capital structure timing, and assets under management and negative loadings on adding value and operating improvements. This suggests a factor that is operating improvements versus financial engineering.

Both the cluster analysis and the factor analysis appear to divide firms into those that have a focus on operating improvements versus financial engineering and those that have a focus on investing in new management versus the incumbent. These results provide one expected and one unexpected result. We do not find it surprising that private equity firms pursue strategies that are largely based on financial engineering and others pursue strategies based on operational engineering. The different firm strategies toward incumbent management, however, are surprising. The importance of people and incentive alignment has been well established within the private equity industry. What has not been explored are the distinctive approaches to

Table 32

Cluster analysis.

This table reports the results of a cluster analysis using partition clustering that divides “the observations into a distinct number of non-overlapping groups” (kmeans in Stata). The analysis generates three clusters. *dteb* is debt to total capital; *dteb* is debt to EBITDA (earnings before interest, taxes, depreciation, and amortization); *cstime* is the sum of the rankings the private equity (PE) investors give to timing factors as important determinants of capital structure; *cstrade* is the sum of the rankings given to trade-off factors as important determinants of capital structure; *invbus* is the sum of the ranks given to the business model and the industry in an investment decision; *invgmt* is the rank given to the management team; *invaddv* is the rank given to the ability to add value; *recruitb* is one if the PE investor typically recruits its own senior management team before investing; *propdeal* is the fraction of deals the PE investors claim are proprietary; *growth* equals one if the PE investor’s top ranking is growth in the value of the business; *opimp* equals one if the top ranking is operating improvements; *costred* is the fraction of deals the PE investor expects for cost reductions pre-investment; *revgrow* is the fraction of deals the PE investor expects for prospective revenue growth pre-investment; *chceo* is the fraction of deals the PE investor expects that changing the CEO is important pre-investment; *buylovsellhi* measures the importance of creating value buying low or selling high; *multarb* equals one if the general partner’s top ranking is industry-level multiple arbitrage; *oppart* is the fraction of deals that involve operating partners; and *aum* is assets under management.

Variable	Cluster #1		Cluster #2		Cluster #3		All	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
<i>Dtcap</i>	0.54	0.60	0.59	0.60	0.54	0.60	0.55	0.60
<i>Dteb</i>	3.64	3.50	3.95	4.00	4.11	4.00	3.88	4.00
<i>Cstime</i>	7.87	9.00	7.69	8.00	7.32	8.00	7.64	8.00
<i>Cstrade</i>	3.48	3.00	5.00	5.00	3.58	4.00	3.93	4.00
<i>Invbus</i>	7.83	8.00	7.38	7.50	8.47	8.00	7.91	8.00
<i>Invgmt</i>	4.04	4.00	3.75	3.50	3.79	4.00	3.88	4.00
<i>Invaddv</i>	3.04	3.00	4.00	4.00	3.79	4.00	3.55	3.00
<i>Recruitb</i>	0.30	0.00	0.44	0.00	0.26	0.00	0.33	0.00
<i>Propdeal</i>	0.50	0.50	0.46	0.50	0.53	0.50	0.50	0.50
<i>Growth</i>	0.91	1.00	0.63	1.00	0.84	1.00	0.81	1.00
<i>Opimp</i>	0.04	0.00	0.25	0.00	0.16	0.00	0.14	0.00
<i>Costred</i>	25.17	20.00	55.38	55.50	31.42	20.00	35.55	25.00
<i>Revgrow</i>	73.04	80.00	82.19	87.50	66.16	70.00	73.31	80.00
<i>Chceo</i>	31.39	29.00	40.06	40.50	30.00	26.00	33.33	30.00
<i>Buylovsellhi</i>	181.48	175.00	190.38	190.00	68.74	70.00	147.00	150.00
<i>Multarb</i>	3.20	3.00	2.70	3.00	2.60	2.50	2.90	2.50
<i>Oppart</i>	13.35	6.00	91.56	100.00	55.05	60.00	48.59	39.50
<i>Aum</i>	7.15	2.11	9.11	1.80	12.25	8.00	9.36	2.65
Number of firms	23	23	16	16	19	19	58	58

solving these people issues. Future research should explore the effectiveness of these various approaches.

10. Founder types and firm types

In this section, we consider whether PE firm strategies are related to the characteristics of the founding general partners. We classify the founding general partners of each of the PE firms in our sample. In our sample of firms, we gather information on the identity of firm founders from the private firms’ Web pages or news articles. Education and career histories are then gathered from the same sources or via LinkedIn.

A founding general partner is classified as “financial” if the GP worked in investment banking, commercial banking, or investment management or had previously been a chief financial officer. “Operational” GPs are those founders that had prior work history in consulting, operations, or general management. Finally, we classify a founding general partner as having a “private equity” background if the GP came from another PE or venture capital firm prior to founding the current one. For each firm, we calculate the average background of the firm by simply classifying the fraction of founders with each type of career history. We then perform a cluster analysis on those three variables (fraction of each career history) and classify 27 firms as

having a finance background, 25 firms as having an operational background, and nine firms as having a private equity background.

In Table 34, we explore how these types relate to specific strategies. Private equity firms founded by financial general partners appear more likely to favor financial engineering and investing with current management. Private equity firms that have founders with private equity experience appear to be the most strongly engaged in operational engineering. They are more likely to invest with the intention of adding value, to invest in the business, to look for operating improvements, to change the CEO after the deal, and to reduce costs. Firms founded by general partners with operational backgrounds have investment strategies that fall in between the other two groups.

These results, while preliminary, do seem to indicate that career histories of firm founders have persistent effects on private equity firm strategy. This result is similar to the work of Bertrand and Schoar (2003) that demonstrates persistent effects of senior management in organizations they lead in terms of firm strategy. The strategies identified for private equity firms clearly align with the firm founders’ careers. While these results are preliminary, future research should explore whether investments that align with the strength of the firm founders do better or worse in the long run than do investments that deviate from these strengths.

Table 33

Factor analysis.

This table reports the results of a factor analysis of sample private equity (PE) firm characteristics and answers. *dtpcap* is debt to total capital; *dteb* is debt to EBITDA (earnings before interest, taxes, depreciation, and amortization); *cstime* is the sum of the rankings the PE investors give to timing factors as important determinants of capital structure; *cstrade* is the sum of the rankings given to trade-off factors as important determinants of capital structure; *invbus* is the sum of the ranks given to the business model and the industry in an investment decision; *invmgmt* is the rank given to the management team; *invaddv* is the rank given to the ability to add value; *recruitb* is one if the PE investor typically recruits its own senior management team before investing; *propdeal* is the fraction of deals the PE investors claim are proprietary; *growth* equals one if the PE investor's top ranking is growth in the value of the business; *opimp* equals one if the top ranking is operating improvements; *costred* is the fraction of deals the PE investor expects for cost reductions pre-investment; *revgrow* is the fraction of deals the PE investor expects for prospective revenue growth pre-investment; *chceo* is the fraction of deals the PE investor expects that changing the CEO is important pre-investment; *buylowsellhi* measures the importance of creating value buying low or selling high; *multarb* equals one if the general partner's top ranking is industry-level multiple arbitrage; *oppart* is the fraction of deals that involve operating partners; and *aum* is assets under management. Likelihood-ratio test: independent vs. saturated: $\chi^2(153)=376.57$; p -value=0.0000.

Panel A: Principal factors, unrotated (58 observations, 11 retained factors, 143 parameters)						
Factor	Eigenvalue	Difference	Proportion	Cumulative		
Factor #1	2.5695	0.6027	0.2659	0.2659		
Factor #2	1.9668	0.2159	0.2035	0.4695		
Factor #3	1.7509	0.4964	0.1812	0.6507		
Factor #4	1.2545	0.1910	0.1298	0.7805		
Factor #5	1.0635	0.3087	0.1101	0.8905		
Factor #6	0.7548	0.2473	0.0781	0.9687		

Panel B: Factor loadings						
Variable	Factor #1	Factor #2	Factor #3	Factor #4	Factor #5	Factor #6
Dtpcap	0.5621	-0.0327	0.4938	0.0708	-0.2085	-0.2560
Dteb	0.5035	-0.0410	0.6676	-0.0047	-0.1817	0.0605
Cstime	0.1665	-0.2789	0.3737	0.2625	0.2806	-0.1203
Cstrade	0.1097	0.0423	-0.1426	0.1490	-0.0639	0.1176
Invbus	-0.2527	0.1049	0.0168	0.3620	-0.5344	-0.1266
Invmgmt	-0.2061	-0.2732	0.1520	-0.1401	0.5712	0.1638
Invaddv	0.5915	0.0930	-0.2394	-0.3619	-0.1367	0.1696
Recruitb	0.1495	0.5952	0.1109	0.2706	0.1373	0.0994
Propdeal	-0.3721	0.4450	-0.1385	0.2428	-0.0297	0.3292
Growth	-0.6203	0.3045	0.4265	-0.4185	-0.1212	-0.0479
Opimp	0.5183	-0.3698	-0.5246	0.3405	-0.0026	0.0244
Costred	0.5507	0.1235	0.0199	-0.3660	0.1529	-0.1378
Revgrow	-0.0509	0.5792	-0.1024	-0.1207	0.1880	-0.2658
Chceo	0.3892	0.6732	-0.2110	-0.0282	-0.0566	-0.0677
Buylowsellhi	0.0983	0.3450	0.0160	0.2469	0.3541	-0.2450
Multarb	0.2566	0.2428	0.1569	0.3298	0.2231	0.1216
Oppart	0.3305	0.0754	-0.2566	-0.3633	-0.0318	0.1694
Aum	0.2185	0.1442	0.4313	0.0482	-0.0320	0.5167

11. Conclusion

Over the past decade, academic finance has explored the impact of PE firms in a number of areas by examining sometimes limited data. In this paper, we attempt to highlight the impact of PE investors utilizing different data. We report what PE investors say they do by tabulating the results of a survey of PE investing practices. Because PE investors are highly educated, have strong incentives to maximize value, and have been very successful, their practices likely also have been successful. We are interested in how their responses correlate with what academic finance endorses and what it teaches. Do private equity investors do what the academy says are best practices?

We find that very few investors use DCF or net present value techniques to evaluate investments. Instead, they rely on internal rates of return and multiples of invested capital. This contrasts with the results in [Graham and Harvey \(2001\)](#), who find that CFOs use net present values as often as internal rates of return. The result also conflicts with the focus on net present value in most business school finance courses. Furthermore, few PE investors use the capi-

tal asset price model to determine a cost of capital. Instead, PE investors typically target a return on their investments well above a CAPM-based rate. Target IRRs also seem to be adjusted by different PE firms utilizing different factors. Hence, different PE firms likely have different target IRRs for the same deals.

The fact that they do not use DCF techniques is interesting. It could indicate that IRR and MOIC techniques are sufficiently robust or effective that DCF techniques are not necessary. Alternatively, it could indicate some practical deficiency with DCF techniques, especially in the private equity setting in which fund structures limit investment horizons and considerable asymmetric information exists between general and limited partners. These settings may make managing via IRR-based investment decisions better.

The fact that PE investors target returns that exceed CAPM-based returns is consistent with their believing that they add meaningful value to their investments and that they need to do so to generate their compensation. As the industry becomes more competitive, it will be interesting to see if target hurdle rates come down.

Table 34

Relation of founder and firm characteristics.

This table reports the relation of founder characteristics to firm characteristics of the sample private equity (PE) investors. PE investors are classified as finance, operational, or other PE based on a cluster analysis on the fraction of their founders with financial, operational, or previous PE backgrounds. dtcap is debt to total capital; cstime is the sum of the rankings the PE investors give to timing factors as important determinants of capital structure; cstrade is the sum of the rankings given to trade-off factors as important determinants of capital structure; invbus is the sum of the ranks given to the business model and the industry in an investment decision; invmgmt is the rank given to the management team; invaddv is the rank given to the ability to add value; recruitb is one if the PE investor typically recruits its own senior management team before investing; propdeal is the fraction of deals the PE investors claim are proprietary; growth equals one if the PE investor's top ranking is growth in the value of the business; opimp equals one if the top ranking is operating improvements; costred is the fraction of deals the PE investor expects for cost reductions pre-investment; revgrow is the fraction of deals the PE investor expects for prospective revenue growth pre-investment; chceo is the fraction of deals the PE investor expects that changing the chief executive officer is important pre-investment; buylowssellhi measures the importance of creating value buying low or selling high; and aum is assets under management.

Variable	Mean (all)	Finance	Operations	Other PE
Dtcap	0.56	0.52	0.58	0.57
Cstime	7.47	7.33	7.76	7.00
Cstrade	3.86	3.26	4.64	3.22
Invbus	7.77	7.44	8.20	8.56
Invmgmt	3.82	4.26	3.56	2.89
Invaddv	3.63	3.37	3.52	4.22
Recruitb	0.31	0.30	0.32	0.22
Propdeal	0.51	0.54	0.46	0.47
Growth	0.80	0.78	0.80	0.78
Opimp	0.13	0.11	0.12	0.22
Costred	35.6	25.0	38.1	42.3
Revgrow	70.3	66.6	70.5	80.6
Chceo	30.6	26.3	30.4	48.8
Buylowssellhi	140.9	155.4	150.2	125.0
Aum	9.55	10.30	11.06	4.72
Year_founded	1993.5	1992.7	1994.5	1994.2
Number of responses	79	27	25	9

We also find that PE investors believe that absolute, not relative, performance is most important to their LP investors. The focus on absolute performance is notable given the intense focus on relative performance or alphas for public market investments. There are two possible explanations for this. First, LPs, particularly pension funds, may focus on absolute returns because their liabilities are absolute. Alternatively, the chief investment officers of the LPs choose a private equity allocation based on relative performance, but the professionals who make the investment decisions care about absolute performance or performance relative to other PE firms. We believe that the advent of greater dissemination of risk-based performance benchmarks such as PMEs is likely to affect the view of limited partners and potentially trickle back down to the private equity general partners.

In choosing the capital structures for their portfolio companies, PE investors appear to rely equally on factors that are consistent with capital structure trade-off and market timing theories. Again, these results are somewhat different from those for CFOs in [Graham and Harvey \(2001\)](#). The market timing result is consistent with the findings in [AJSW \(2013\)](#). This result is arguably favorable both to the traditional instruction at business schools and to the more recent advances in behavioral finance.

PE investors expect to provide strong equity incentives to their management teams and believe those incentives are very important. They also structure smaller board of investors with a mix of insiders, PE investors, and outsiders.

Finally, PE investors say they place a heavy emphasis on adding value to their portfolio companies, both before and after they invest. The sources of that added value, in order of importance, are increasing revenue, improving incentives and governance, facilitating a high-value exit or sale, making additional acquisitions, replacing management, and reducing costs. Consistent with adding operational value, the PE investors make meaningful investments in employees and advisers who provide advice and help in implementing operating improvements.

While we recognize that it is possible that some PE investors report overly positively on some questions in the hope that the PE industry will be cast in a more positive light, particularly in aspects of deal sourcing and value creation, the answers they provided do not give us strong reasons to believe that they have a meaningful impact on our findings and conclusions.

We finish with exploratory analyses to consider how financial, governance, and operational engineering practices co-vary within PE firms. The analyses suggest that different firms take very different strategies. For example, some focus much more heavily on operational engineering, while others rely heavily on replacing incumbent management. These investment strategies are strongly influenced by the career histories of the private equity firm founders. It will be interesting (and, with these data, possible) to see which of these strategies, if any, exhibit superior performance in the future.

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