Evaluating private equity's performance

Approach the "value bridge" with caution

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Foreword

KPMG's Global Valuation Institute (GVI) is pleased to introduce its seventh management paper since the launch of our research agenda. Authored by Peter Morris, a former banker with Morgan Stanley, this paper discusses different approaches to evaluating private equity performance, a subject that has been fraught with uncertainty and controversy for many years.

KPMG Global Valuation Institute recognizes that valuation is a constantly evolving discipline that has been shaped by practical and theoretical advances. Many high quality research papers on valuation subjects never find their way to influencing the evolution of standards and practice due to a lack of exposure to practitioners. In addition, inertia and entrenched habits and interests make necessary change difficult.

Our goal is to act as a catalyst for the adoption of breakthrough valuation research. To this end, KPMG's GVI benefits from the expertise of an Academic Advisory Board comprised of professors from Northwestern University in the US and Oxford University in the UK. This Board designs a research agenda and selects and reviews the research we sponsor.

KPMG Global Valuation Institute works closely with researchers to present their managerial papers in a format that is understandable to a broad range of business professionals. This includes illustrative papers with applications and/or case studies. Through this process, we keep KPMG's global network of 1,300 valuation professionals informed of emerging valuation issues and offer other interested parties a tool to monitor new and interesting developments in valuation.

The use of the "value bridge" in private equity has been subject to controversy, notably within the Limited Partners community. Although the academic literature does not support a link between value creation and the "value bridge" in buyouts, the latter continues to be used in practice. In this paper, the author explains the shortcomings of the value bridge and illustrates how economic performance should be interpreted.

This paper is the seventh in a series that has been sponsored by KPMG's Global Valuation Institute. As practitioners, we trust that you will find these of interest.

To read more about KPMG's Global Valuation Institute and download the full series, visit kpmg.com/gvi.

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Abstract

Private equity (buyout) firms are well paid for what they do. Supporters justify these high rewards by pointing to the way buyouts "create value." They argue that the private equity ownership model allows buyout firms to run companies better than is possible under other ownership models, making the overall economic pie bigger. This is both socially and privately valuable, so it deserves high rewards. "Value creation" therefore plays a key role in the private equity story and should be measured in a way that is both accurate and meaningful. This requires looking beyond familiar headline measures of return such as internal rate of return (IRR) and cash multiple. Unfortunately, a standard tool among private equity practitioners fails this test. This simple model, known as the "value bridge," is accurate in that its numbers add up. But although the numbers in the value bridge are mathematically true, they need to be interpreted with care. The value bridge fails to reflect how much debt contributes to private equity returns, because it captures only one dimension of debt. And because it looks at operating performance in absolute terms, rather than relative to peers, the value bridge fails to measure if a company has been run better than its peers. A better way to measure value creation in private equity is already available in the academic literature. It starts from economics, not accounting, and breaks down the profit on a buyout into three main factors: the return on a stock market comparable, the impact of high debt, and a residual that may include the effect of running the company better relative to peers. Not everyone in private equity has an incentive to use this more-meaningful approach. But investors and policy makers should take an interest.

Peter Morris
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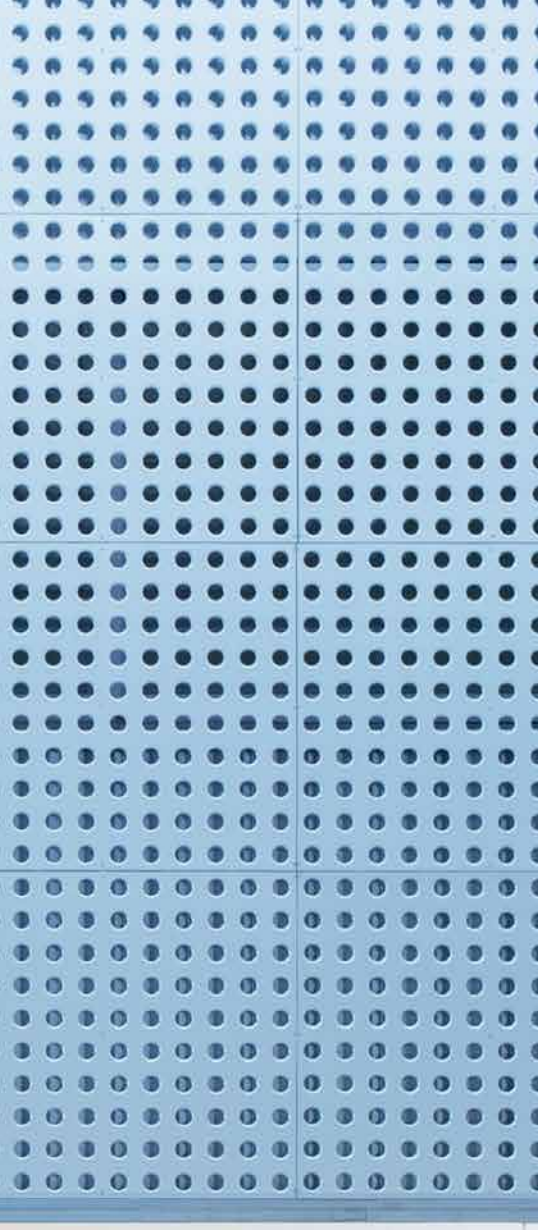

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Table 1 Major private equity firms

Implied cost of fees and carry, to December 2014

	Earliest year	Committed capital (bn)	Capital invested (bn)	Value (bn)	Gross IRR	Net IRR	Fees + carry p.a.	[Fees + carry] as % of gross IRR
Apollo	1990	$54.3	$42.9	$85.4	39%	25%	14%	36%
Blackstone	2002	$68.6	na	$94.0	27%	28%	7%	25%
Carlyle	1994	na	$56.0	$116.9	27%	19%	8%	30%
KKR	1976	$83.7	$67.1	$137.8	26%	19%	7%	26%
Average					**30%**	**21%**	**9%**	**30%**

Funds included

Apollo	Funds I-VIII
Blackstone	BCP IV-VI, BEP I, Tactical Opportunities, Strategic Partners
Carlyle	Fully-invested funds
KKR	Legacy funds 1976-96 and Included Funds

Source: 10K filings, author calculations

Pension funds and other private equity investors pay high fees to the private equity firms that manage their money. (In this article, "private equity" refers only to buyouts.) How high? It is hard to capture this in one figure, but four of the largest private equity firms now file reports with the US Securities and Exchange Commission (SEC), which give some indication. Table 1 shows that, since 1976, fees and carried interest have cost investors in these managers' funds between 7 percent and 14 percent per annum.[1] These four managers have historically received between one-quarter and one-third of the gross returns that they generated.

People who work in private equity — both fund managers and investors — say that although these costs are substantial, they represent good value, and not just because investors receive high returns. How the returns are generated is even more important. Private equity sees itself as a cut above the rest of the investment pack. Where most investment managers generate returns through some combination of market timing and/or stock picking, private equity says it does something harder and more valuable: it 'creates value,' meaning it makes the overall economic pie bigger than it otherwise would be.

The term "value creation" lacks a clear definition. Different people use it to mean different things. What this article means by private equity value creation is only that part of an investment return that comes from making the economic pie bigger than it otherwise would be. This embraces a full range of familiar private equity strategies: for example, running a

[1] These figures are likely to exclude additional fees paid to managers, such as the fees that portfolio companies pay for monitoring, financing, etc. The annualized cost is expressed here in terms of an internal rate of return (IRR), which may not be directly comparable to more-conventional measures of return/cost. The annualized cost that these private equity managers' SEC filings imply is generally similar to the 7 percent figure estimated in Phalippou (2009). On November 16, 2015, CalPERS, a major pension fund investor in private equity, held a Private Equity Workshop. This included a presentation in which slide nine showed the estimated cost of investing in private equity as 7 percent per annum. Presentation available at https://www.calpers.ca.gov/docs/board-agendas/201511/invest/Workshop02-01.pdf

single company more efficiently, growing it faster, breaking up a conglomerate, creating bigger groups through a buy-and-build approach, and so on.

Private equity value creation in this sense excludes several items that are regularly referred to as "value creation. These include a general market increase in profits, market timing, stock picking and financial engineering. The returns that come from these sources are real enough. Such returns will help pay for pensions over the long term. But they do not come from making the economic pie bigger than it otherwise would be.

Private equity managers charge higher fees than traditional investment managers. To justify this, private equity managers should be able to demonstrate that their investments have outperformed. Merely matching the performance of non-private equity companies does not support incremental fees. Therefore, this article distinguishes private equity value creation from value creation generally. The latter comprises the overall change in value, while the former reflects the incremental performance relative to non-private equity peers.

The two most-familiar measures of return in private equity are the internal rate of return (IRR) and the cash multiple. These measures of overall return both fail to distinguish between what would have been achieved anyway and what can be attributed to private equity. The result is that neither the IRR nor the cash multiple is very helpful when it comes to measuring private equity's value creation. A private equity investment may generate a high overall return (measured as IRR or cash multiple) without involving any value creation at all by private equity. If the profit has come from a general increase in profits, market timing or financial engineering, then the economic pie is no bigger as a result of this investment than it would have been otherwise.

Private equity claims it creates value by running companies better. That makes it essential to measure accurately what proportion of private equity returns does in fact come from running companies better. This article therefore looks behind headline return figures such as IRR and cash multiple.

Two broad approaches to breaking down the overall return in private equity are available. The one that appears to be most widely used is known as the "value [creation] bridge."[2] The mathematics and the accounting in the value bridge are accurate and it is useful in some ways. However, it fails to give an accurate picture of how much of private equity's returns come from running companies better.

[2] The fact that private equity practitioners have preserved such a high degree of privacy makes it impossible to prove definitively that the "value bridge" is the most widely used. This assertion necessarily relies on circumstantial evidence, some of which is presented later in the article, and on the author's personal experience.

The value bridge

The most widely used measure of value creation in private equity is based on accounting. A common term for it is the "value bridge." Its accounting and its numbers both add up. But when it comes to what it is supposed to be measuring, the value bridge needs to be interpreted with caution. First, the value bridge measures the gross change in a company's value and attributes that to the private equity manager, ignoring what is happening in the stock market and the wider economy. That means it usually provides full credit to the private equity manager for the company's financial and market performance, instead of measuring its performance relative to peers. Second, the value bridge measures debt repayment rather than the boost that comes from higher debt (literally, "leverage"). That means it often understates the impact that debt has on a buyout's return.

Here is how the value bridge works. Imagine a private equity manager invests an amount, A, in buying a company. The manager owns the company for four years, then sells it at a profit. The value bridge divides the profit into three parts. B is the impact of any increase in a company's profits, measured in earnings before interest, tax, depreciation and amortization (EBITDA) while the private equity manager owned it.[3] C reflects the change in the valuation multiple. D is the amount of debt the company repaid over the four year life of the buyout. A + [B + C + D] adds up to the gross return investors receive from the original investment. It is as simple and as elegant as that.

A recent example illustrates how the value bridge works. The names are fictitious because the aim is to illustrate just the principles involved. In March, 2010, a private equity firm (call it "LEF") bought a company that we will call "Company A" for US$1.35 billion (£973 million)[4], putting up US$703.3 million (£506 million) in equity and borrowing the rest. At the time, Company A's EBITDA was about US$116.7 billion (£84 million), so the LEF group paid about 11.5 times EBITDA for the company.

Four years later, Company A floated on the stock market. The flotation price valued the company at US$2 billion (£1.44 billion). The LEF group retained a 60 percent stake. Clearly, the final result of the LEF group investment in Company A will not be known until it has sold all of its holdings.[5] To keep things simple, the analysis that follows assumes that the LEF group sold all of its holding in 2014 at the flotation price.

On that basis, the LEF group's investment in Company A generated a gross profit of US$790.9 million (£569 million) on an initial investment of US$703 million (£506 million). Table 2 shows how the value bridge would work for Company A.

[3] EBITDA (earnings before interest, taxes, depreciation and amortisation) is an informal measure of profits that is not formally defined by any international set of accounting standards. It dates back to the growth of private equity and leveraged finance in the US in the 1980s. It remains widely used in buyouts as well as other markets, despite some serious shortcomings: for example, it fails to reflect a company's need to reinvest in its business in terms of either working capital or capital expenditure.

[4] Source: company filings and author calculations. The example is chosen purely for illustrative purposes. LEF provided helpful feedback but declined to discuss different ways of measuring value creation. In this article, the term "LEF group" refers collectively to the entities that bought Company A in a transaction LEF initiated and led.

[5] Following the IPO, Company A's share price underperformed a falling stock market. Since then it has recovered and has now (March 2016) outperformed the FTSE 250 since the IPO.

Table 2 Company A, 2010-14: value bridge calculation

[£ million]	Acquisition	Increase in EBITDA	Increase in multiple	(Reduce) debt	Exit
EBITDA	**£84**	£22.7	£107		**£107**
Debt	£467			£30	£497
Equity	£506				£945
Enterprise value (EV)	**£973**	£262	£207		**£1,442**
EV/EBITDA multiple	11.5x	11.5x	1.9x		13.5x
Increase in EBITDA	£262	46%			
Incr multiple ("multiple arbitrage")	£207	36%			
Debt reduction*	£100	18%			
Total gain	**£569**	**100%**			

** Adjusted to reflect pre-IPO dividend of £130m*
Source: company reports, author analysis

Working from left to right:

Increase in EBITDA. Over the four years that LEF controlled Company A, the company's EBITDA increased by 27 percent to US$148.7 million (£107 million) from US$116.7 million (£84 million). If the profit multiple had remained the same from 2010 to 2014, the company's value would have increased by 11.5 x US$31.5 million (£22.7 million), or US$364 million (£262 million).

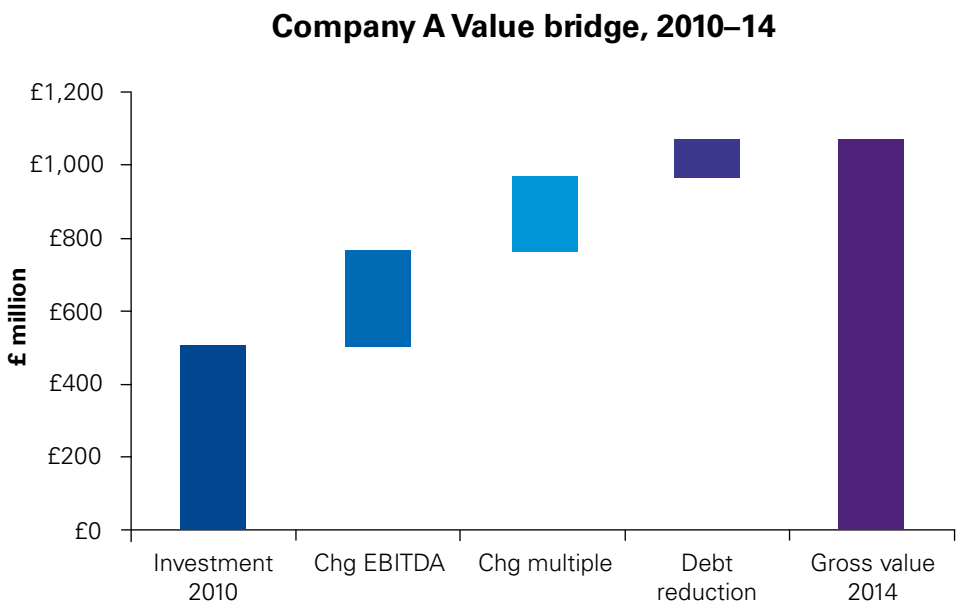
Increase in multiple. The valuation multiple did not stay the same: it increased to 13.5 from 11.5 times. Applying this increase to all the profits adds another US$287.7 million (£207 million) to the company's value.

Change in net debt and interim distributions. It looks as though Company A's debt increased by US$41.7 million (£30 million) between 2010 and 2014. In fact, in 2013 the company borrowed more to pay a US$180.7 million (£130 million) dividend to its owners, the LEF group. Without that dividend recap, debt would have fallen by US$139 million (£100 million).

These three items add up to US$790.9.million (£569 million): the gross profit that the LEF group realized on this investment. Some further simple arithmetic shows that about half that profit came from the increase in Company A's profit (EBITDA) over four years. Another one-third came from the increase in the valuation multiple — people in private equity often call this "multiple arbitrage."[6] The remaining one-fifth came from paying down debt.

[6] This is an example of how finance practitioners routinely misuse the word "arbitrage." An "arbitrage" is a risk-free profit. But private equity managers do not know for certain in advance that a company's valuation multiple will go up.

Chart 1 **Company A, 2010-14: value bridge chart**



Source: company filings, author calculations

LEF doubled its investors' money over four years in the Company A investment, turning US$703 million (£506 million) into US$1.494 billion (£1.075 billion). That is a multiple of 2.1 times and a gross internal rate of return (IRR) of 21.6 percent. The value bridge appears to show where the profit came from. It suggests that four-fifths of the profit came from factors that had nothing to do with debt or financial engineering, namely, increases in profits (EBITDA) and the valuation multiple. Only about a fifth of the profit came from paying down debt.

Recall that private equity value creation, properly defined, means making the economic pie bigger than it otherwise would be, by running companies better. A superficial reading of the value bridge might suggest that four-fifths of the profit in the deal came from running Company A better. The rest of this article will explain why that would be a misunderstanding of whether private equity truly created value.

What is wrong with the value bridge?

The math in the value bridge is correct. This accounting analysis describes accurately how US$703 million (£506 million) became US$1.494 billion (£1.075 billion). But accounting should not be confused with an economic analysis. The value bridge as it is used ignores the question of how much the buyout firm outperformed what investors might have received from a lower-cost investment. It also fails to address the issues of extra financial risk and the time value of money.

1. Debt

The first flaw in private equity's value bridge relates to debt. Intuition and common sense both say that the more debt a buyout uses, the bigger the contribution debt will make to the return from the deal, assuming that the company generates returns in excess of the cost of debt. That is why we use metaphors for debt like "leverage" and "gearing." Crudely, debt gives you more bang for the buck: the more debt, the more bang.

It is easy to assume that since the numbers in the value bridge add up, the value bridge must show the same thing: more debt, more bang. In fact, the value bridge shows the exact opposite. According to the value bridge, the more debt in a buyout, the smaller the contribution debt makes to the return on the deal: more debt equals less bang for the buck.

The reason for this counter-intuitive result is that the value bridge does not provide a complete picture of how borrowing affects an investor's return. Instead, it measures just one dimension, namely, the amount of debt that a buyout repays. That helps to explain the value bridge's apparently counter-intuitive result.

It is easy to see that the lower a company's debt level, the more excess cash flow it will generate to repay debt (because interest charges are lower). But because the value bridge fails to relate the amount of debt a buyout repays to the size of the initial equity investment in the deal, it fails to provide a complete picture. Holding all else constant, increasing the amount of equity in a deal will reduce the amount of debt, and therefore increase the amount of debt that gets repaid. In the value bridge's calculation, that counts as a simple positive contribution to the return on the deal.

But equity investors do not only care about the absolute amount of excess cash flow a buyout produces. What they really care about is the relationship between that excess cash flow and their investment. If they increase their equity investment in the deal, they will increase the (absolute) amount of excess cash flow that the buyout generates; but they will also reduce the (relative) rate of return on their initial investment.

Table 3 illustrates this point. A stylized company undergoes a buyout at an enterprise value of US$1,200, using three different capital structures: A, B and C. Over the next five years, the company's operating performance is static: sales, margins and reinvestment in working capital and capex see no change. The company:

— pays 5 percent interest on its debt;

— pays a 30 percent tax charge;

— uses excess cash flow to pay down debt;

— is sold after five years at the same valuation multiple and absolute value.

Table 3 Hypothetical buyout: impact of capital structure on debt repaid and IRR

	Capital structure A	Capital structure B	Capital structure C
Initial debt	$900	$600	$300
Initial equity	$300	$600	$900
Enterprise value	**$1,200**	**$1,200**	**$1,200**
Debt repaid/profit for equity yr 5	$206	$263	$319
Equity value at exit yr 5	$506	$863	$1,219
Cash multiple	1.69x	1.44x	1.35x
IRR to equity	11.0%	7.5%	6.3%

Source: author calculations

The value bridge calculation captures only the absolute amount of debt that is repaid in the deal. The value bridge would therefore say that the deal structure in which debt made the biggest contribution to returns was C: the deal with the lowest financial leverage.

But Table 3 shows how one-dimensional this approach is. Although capital structure C saw the highest absolute amount of debt repaid, it also produced the lowest cash multiple and IRR on the initial equity investment. Conversely, capital structure A saw the lowest amount of debt repaid but the highest equity return. Capital structure A brought the highest return because it involved the highest financial leverage. Its investors made the highest return because they took the most risk.

The one-dimensional nature of the value bridge explains why it does a poor job of explaining how much of the return in a buyout comes from leverage.

2. EBITDA and valuation multiple

What about the other two parts of the value bridge: the change in profits and the change in multiple ("multiple arbitrage")? Here the problem is different: the value bridge makes no attempt to distinguish between the impact a company's managers had, relative to its peers, and changes that resulted from general market conditions and what the average manager did.

Take an increase in profits. Company A's EBITDA increased over the four years between 2010 and 2014 (Table 2). Perhaps managers did a better job than their competitors of marketing, or controlling costs. Perhaps the general economy got stronger and/or all managers in the sector successfully grew sales or margins. A superficial reading of the value bridge implicitly attributes all the increase in profits to the buyout firm. But if comparable companies saw similar profit increases, Company A's owners and managers cannot claim to have made the economic pie bigger than it would have otherwise been.

The same point applies to profit multiples. The 2014 IPO valued Company A at a higher multiple than LEF paid when it bought the company in 2010 (Table 2). Once again, because the value bridge fails to take account of the world outside the buyout, it implicitly attributes the increase in the multiple to the private equity manager. But suppose other companies like Company A saw a similar increase in valuation multiple between 2010 and 2014. In that case, the buyout firm might be able to claim credit for market timing or stock picking. But that does not involve making the economic pie bigger than it would have been in any case.

When it comes to changes in profits and in valuation multiple, the flaw in the value bridge is different from the one that applies to debt. On these two points, the

problem with the value bridge is that it treats buyouts as though they take place in a vacuum. Viewed in isolation, the value bridge implicitly assumes that if LEF had not controlled Company A from 2010 to 2014, Company A's profits and valuation multiple would have remained exactly the same.

Both buyouts and conventional quoted companies operate in a dynamic world. Factors beyond management's control are constantly changing. Investors and analysts who follow quoted companies routinely take this into account. When they assess how well a manager has performed, they try to distinguish the manager's impact on results from that of market conditions. In measuring the performance of traditional investment managers, it is well established that it's performance relative to a benchmark that's relevant. In other words, traditional investment managers cannot point to absolute returns as a measure of skill or value added. The value bridge fails in this regard for buyouts.

For all three factors — debt, EBITDA and the valuation multiple — the numbers in the value bridge add up. This is not a question of faulty accounting or arithmetic. The problem is more that the value bridge needs to be used with care.

The value bridge has its uses. At a basic level, it is helpful to know whether the gain in a buyout owes more to a change in profits (EBITDA) or in valuation multiple. But those are the answers to a different question than the one of true performance attribution.

Performance attribution means determining the true sources of return. The value bridge ignores external influences on a company and captures only one dimension of debt. That creates a risk: If read in the wrong way, the value bridge will overestimate the impact of how a buyout was run and underestimate the impact of debt on the return.

Those familiar with private equity will know that this is not the only example of numbers that, while accurate, need to be interpreted with care. As noted previously, Internal Rate of Return (IRR) is one of the most common ways to measure returns in private equity. IRR is a standard calculation in finance. It is mathematically correct. Yet the use of IRR to measure private equity returns contains well-known pitfalls. A recently published survey of the private equity literature observes: "The main criticism for using IRR as a PE performance measurement is its assumption that all cash flows are reinvested at the IRR."[7] This creates a risk that an IRR figure may simultaneously be true and overstate the return that investors actually earn over the life of the fund. As one practitioner guide to private equity points out: "The impact of using IRR as a measure is therefore to give undue weight to the speed with which returns are realized and may in extremis result in severely sub-optimal allocation of resources."[8]

The value bridge is used to allow private equity managers to take credit for more of the profit on a buyout than they are entitled to. It also helps them claim that debt plays a less important role in their returns than it really does. Both points have been prominent in the public debate about private equity.

Private equity is hard to measure because it is complicated. That makes it crucial to be clear about what one is trying to measure. One needs to understand what a given measure shows and does not show.

[7] R. Spliid, "Benchmark Biases in Private Equity Performance," Chapter 15 of *Private Equity — Opportunities and Risks*, Oxford University Press, 2015.

[8] J. Gilligan and M. Wright, "Private Equity Demystified," *ICAEW, 2014,* page 124. For a fuller discussion of the IRR issue, see Gottschalg, O., and L. Phalippou (2009), "The performance of private equity funds," *The Review of Financial Studies,* 22 (4), pp. 1747–76; Phalippou, L. (2008), "The hazards of using IRR to measure performance: The case of private equity," *The Journal of Performance Measurement,* 12 (4), pp. 55–56.

Who uses the value bridge?

Despite opening up a little during the past few years, the private equity community still focuses on being private. This makes it hard for outsiders to know what goes on behind its closed doors. But a range of publicly available sources make clear that the value bridge is the most widely measure of "value creation."

One example of a private equity manager commenting in the public domain is Cinven, a London-based private equity firm with US$18 billion of assets under management.[9] Unlike most of its peers, Cinven usually provides in its annual review an analysis of where its historic profits have come from. A value bridge chart appears in the reviews for 2008 and for each year from 2010 to 2013. The 2013 review says that Cinven's approach to value creation "is not dependent on M&A cycles or financial engineering."[10] Although the 2014 review appears not to contain a value bridge chart, Cinven's website still shows one under the heading "Creating value."[11] This rare level of transparency is to Cinven's credit. But the firm's analysis follows the traditional value bridge accounting model.

Another private equity firm that explicitly uses the value bridge is Silverfleet (formerly PPM Capital), a European buyout firm which in June 2015 announced it had raised a US$922- million (€850-million) fund. Silverfleet's website includes a section called "Creating Value."[12]

A classic value bridge chart breaks down "equity growth" into three components: "earnings growth,""multiple effect" and "debt reduction."

Several funds of funds organizations also describe "value creation" in this way for the benefit of smaller private equity investors who employ them. For example, in September 2013 Pantheon Group stated: " ... the value bridge breaks down the various components of *how a manager created value* in an investment from the point of entry to the point of exit [emphasis added]."[13]

Until recently, Hamilton Lane's website contained a section called "Research" and a chart called "Value Creation" that set out the value bridge. Hamilton Lane said that this:

— "assesses a fund manager's track record to reveal how the manager has historically added value to portfolio companies;" and

— "determines how the fund manager has generated returns from these investments."[14]

Investors naturally have the biggest reason to want a clear view of where buyout returns come from. But many smaller ones rely for detailed analysis on funds of funds such as the ones just mentioned.

[9] Source: Towers Watson Global Alternatives Survey, July 2014

[10] Cinven annual reviews are available at www.cinven.com. See pages 31–32 in the 2013 annual review.

[11] Available at www.cinven.com/aboutus/creatingvalue.aspx 1/1, accessed 17 March 2016.

[12] Available at http://www.silverfleetcapital.com/we-buy-to-build/creating-value/, accessed 17 March 2016.

[13] Pantheon Group ($31.3 billion of assets under management — source, website): It's the Alpha, Stupid, September 2013. The Pennsylvania Association of Public Employee Retirement Systems (PAPERS) lists includes this document in its research and resource library, available at: www.pa-pers.org/newweb/documents/Summer2014-Pantheonforlibrary.pdf. Accessed 17 March 2016.

[14] www.hamiltonlane.com/Investment_Process/Research/Value_Creation_Model/, accessed 12 July 2015. According to its website, Hamilton Lane looks after $34 billion of discretionary AUM.

In 2014, Stephen Sleigh was running the US$10 billion IAM National Pension Fund, the multi-employer plan sponsored by the International Association of Machinists. "We're familiar with the EBITDA bridge," he said, "but we're one step removed from the process. We hired a fund of funds to do the detailed sorting for us. We get involved at the final meetings and hiring decisions."

The Institutional Limited Partners Association (ILPA) exists to advance private equity investors' interests. It has more than 300 members globally, who represent more than US$1 trillion in private equity investments — a substantial proportion of the market.[15] In 2011, it issued a document called *Quarterly Reporting Standards Best Practices*. This shows private equity managers how their investors would like them to report. It, too, follows the value bridge approach.[16]

"You make a good point," said Kathy Jeramaz-Larson, executive director of the ILPA, in 2014.[17] "The language on page 15 of our *Quarterly Reporting Standards* should be reviewed to ensure it reflects the way investors look at returns, including true value attribution."

One large investor strikes a similar cautionary note. "Most investors would be critical users of the value bridge — they wouldn't necessarily take it just at face value," says Robert Coke, head of absolute return and buyouts at the Wellcome Trust.

These reassurances beg an obvious question: Why is the public domain full of references to how the value bridge measures "value creation" and "value added," but so bereft of any suggestion that it could be misleading?

Florin Vasvari, LBS term associate professor at the London Business School and Fellow of the Coller Institute of Private Equity, accepts that there are issues with the value bridge: "The implementation of the value bridge by practitioners could be misleading with respect to the impact of leverage on returns. The value bridge should take risk into account by discounting for risk and by benchmarking the results."

John Gilligan, partner at accounting firm BDO International and co-author of *Private Equity Demystified,* makes the same point about risk and the value bridge.[18] Along with Vasvari, he also raises a more subtle point about how debt affects buyout returns. "Regardless of the amount of debt that gets repaid," he says, "there are good reasons to think that higher debt levels will increase a company's value anyway, by improving the level of cash generation." With this, he invokes a concept sometimes known as the "discipline of debt."

The discipline of debt plays a central role in the private equity story. It is widely held in the private equity community that high debt does not just provide a financial boost to returns via leverage ("bang for the buck").

[15] Source: website [accessed: 17 March 2016].

[16] Available at: http//ilpa.org/wp-content/uploads/2011/05/ILPA-Best-Practices-Reporting.pdf [accessed 17 March 2016]. See page 15: "Valuation bridge."

[17] Ms Jeramaz-Larson stepped down in June 2015 after eight years as ILPA's executive director.

[18] John Gilligan and Mike Wright, *Private Equity Demystified,* third edition (ICAEW), available at: http://www.icaew.com/en/technical/corporate-finance/financing-change/private-equity-demystified-an-explanatory-guide-160216 [accessed 17 March 2016]. Page 161 shows the calculations for a standard value bridge analysis.

Debt also, it is said, acts as an incentive to change behaviour. The argument is that a tight debt repayment schedule forces managers to focus more on maximizing cash flow than they otherwise might. Even if no debt is repaid, the argument goes, debt will have increased the return on a buyout by helping to improve the company's profits and cash flow: "The increased financial leverage acts both as incentive to use capital more productively and to increase the return on invested equity."[19]

This assertion goes all the way back to Michael Jensen's famous *Harvard Business Review* article in 1989.[20] It has long played a key role in the consensus view of private equity (buyouts) and it has some intuitive appeal. But closer examination reveals at least two flaws in the standard assertion about the role that the discipline of debt plays in private equity.

The first flaw in the standard view involves first principles: private equity's basic structure makes the discipline of debt unnecessary. Debt supposedly gives managers an incentive to maximize a company's cash flow and not to be wasteful. On the face of it, this seems reasonable. But the people who run a private equity-owned company already have all the financial incentive they need to avoid being wasteful. This applies at the level of both the buyout firm (the General Partner) and the portfolio company.

The buyout firm typically stands to earn 20 percent of the profit it generates when it sells a company.[21] In turn, buyout firms routinely give large financial incentives to the operating managers running individual portfolio companies daily. Private equity is built on the idea of "alignment of interest," in which everyone along the chain of ownership and management has a financial interest in making a profit. For the quoted companies Jensen cited in his 1989 article, debt might indeed have acted as a useful incentive in this way if they suffered from the agency costs that Jensen identified. But since private equity claims to have already aligned everyone's interests, it should not need the discipline of debt as well.

A common response at this point is to draw a distinction between buyout firms and the operating managers who run individual companies day to day. Although buyout firms themselves may not need the discipline of debt, the argument goes, debt remains a useful way to focus the minds of the operating managers. But the operating managers of a private equity-owned company stand to earn large sums if they succeed. The idea that these managers need a debt-repayment reschedule to remind them to maximize cash flow is implausible. Furthermore, if buyout firms find complex capital structures helpful for the mechanics of creating executive incentive schemes, they do not need third-party debt to do this.[22]

The second flaw in the standard assertion about the discipline of debt is more empirical. To begin with, the purported effect of the discipline of debt has never actually been shown to exist in private equity. As Vasvari puts it: "I am not aware of any empirical work which proved that the 'discipline of debt' has an effect with respect to the performance of portfolio company managers. It would be very hard to do that."

Not only does the standard assertion about the discipline of debt lack empirical support, but at least one piece of empirical evidence contradicts it. This evidence suggests that the discipline of debt is not necessary to pursue a successful private equity strategy.

[19] BVCA Annual Report on the Performance of Portfolio Companies, VI, page 11. Available at: http://www.bvca.co.uk/researchpublications/researchreports.aspx.

[20] Jensen, M.C., "Eclipse of the Public Corporation," *Harvard Business Review*, October 1989.

[21] This is a simplification. General Partners (private equity investment managers) typically stand to earn 20 percent of the profits after Limited Partners (investors) have received back both their management fees (1.5 percent–2.0 percent per annum) and a preferred return of 8 percent per annum.

[22] Individual operating managers rarely have enough capital to allow them to invest on an equal level with a buyout firm. For that reason among others, buyouts often use complex capital structures to give operating managers the desired incentives: see for example Table 3.3 in Gilligan and Wright (2014). But this could be done without high levels of third-party debt: the buyout firm could simply arrange for the fund it manages to hold the necessary capital instruments.

The quoted UK company Melrose was formed in 2003 with the explicit aim of following a private equity approach.[23] The company's 2011 annual report explains what it does: "Buy — Improve — Sell" ("often between 3–5 years"). It would be hard to improve on that as an elegant and economical description of what private equity sets out to do.

Melrose has been doing what it promised for just over 10 years. Most of its transactions to date have involved buying and selling companies to and from private equity firms.[24] Melrose shareholders have seen returns over 10 years that resemble returns from private equity: the 2014 annual report cites an IRR of 23 percent from 2005 to 2014.

There is one big difference, however, between Melrose and conventional buyout firms: Melrose does not use high debt levels.[25] The 2011 annual report reveals that this is a conscious strategy: "Use public market leverage."

It is unclear whether the Melrose business model could ever be reproduced at scale. But that is irrelevant to the specific question of whether the discipline of debt is necessary for success in private equity. Melrose's track record is a piece of empirical evidence suggesting that the widely held but unproven assertion about the discipline of debt in private equity lacks substance. It supports the view that private equity firms do not need to use high debt levels in order to run companies better — that is, create value.

[23] Melrose's roots go back to the quoted industrial groups that were known as conglomerates. Melrose's Chairman Chris Miller worked at one of the best-known conglomerates, Hanson plc. In 1988 he began building a new one called Wassall plc, which KKR took private in 2000.

[24] 2005: bought McKechnie and Dynacast from Cinven. 2007: sold parts of McKechnie to US private equity firm JLL. 2011: sold Dynacast to US private equity firm Kenner & Co. 2012: bought Elster from CVC (and public shareholders). 2013: sold parts of FKI to KKR and to Carlyle.

[25] Based on financial year end reports, for the period 2005–14 Melrose's average Debt/EBITDA was 2.9x and its average Debt/Enterprise Value was 20 percent. Source: author calculations.

A better way: market-based value creation

Is there a better way to measure "value creation" in private equity? Yes. However, the new approach is used less widely than it should be, as the flawed value bridge approach prevails.

The right way to think about "value creation" in private equity does not start with accounting, such as the value bridge. It starts with economic reality. The economic reality is that returns in private equity come from three main sources:

— The market;

— Extra debt (meaning leverage, not just debt repayment);

— A residual.[26]

The residual could involve many different things, including some or all of: better operational management, good stock picking, skilled deal-making and luck. To reflect the fact that the residual could involve several different elements, call it "abnormal performance."[27]

The instinctive first question investors should ask about the gross return on any buyout ought to be: How does it compare with the stock market over the same period? The best way to measure this is with an increasingly used tool called the Public Market Equivalent (PME). PME addresses the first of the three elements shown above: it tells investors whether they did better from a buyout than in the stock market.

But while PME shows whether a buyout outperformed the stock market, it fails to distinguish between the second and third factors shown above. In other words, it fails to say how much of the difference,

[26] These three are the main sources. Others could be added: for example, foreign exchange effects; and the contribution made by retiring debt at a discount (sometimes referred to as "capturing the discount").

[27] This is the term used by Acharya et al. in "Corporate Governance and Value Creation: Evidence from Private Equity," *Review of Financial Studies,* 26 (2), 368–402.

relative to the stock market, comes from using extra debt, and how much is "abnormal performance."

Most people who follow this approach do not publish every detail of what they do. But one group of authors, working on this for some years, published an article in a leading academic finance journal in 2013. Its title includes the term "value creation."[28] No one could accuse these co-authors of being anti-private equity. They simply ask the questions that investors, and policymakers, ought to be asking already. In technical terms, they start with the gross return on a given buyout, expressed as an IRR. They then break this down into three components:

— the return over the same period on a chosen stock market benchmark;

— the impact on the IRR of using extra debt;

— a residual.

Full details of the approach can be found in the cited article in *The Review of Financial Studies.*

The authors recognize one problem up front: as already mentioned, the IRR can be notoriously unreliable as a measure of the absolute returns that investors actually receive. That means this alternative approach should be used with care, especially where absolute returns are concerned. But our interest here is in the relative contribution of the three main factors: stock market, extra debt and residual. This approach gives an accurate read on that count.

Once again, Company A can serve as the example. The starting point in this approach is the gross IRR that it generated. We saw before that this was 21.6 percent.[29] The value bridge treats this as an absolute figure that came out of a vacuum. The market-based approach looks at the return more sensibly by putting it in context.

First, it compares the gross IRR on the buyout to a stock market return. Choosing the comparable involves some judgment and is therefore open to manipulation. The way to deal with this is to be explicit and consistent. This analysis will use the FTSE 250 midcap index. From March 2010 to March 2014, the total return on the FTSE 250 was 18.7 percent per annum.[30] That means investors in Company A could have achieved almost the same gross return as they actually did (21.6 percent) by investing in the FTSE 250 index. Investing in the FTSE 250 would also have been more liquid and less expensive in terms of fees and carried interest.

The second routine question investors should ask is: How much of the difference in return came from the boost provided by using extra debt and how much was due to "abnormal" performance? Table 4 shows the impact of breaking the Company A gross IRR down fully into its three components.

Now we have the answer to the second question. It turns out that all of the difference in returns between Company A and the FTSE 250 came from using extra debt. In this particular deal, the "abnormal performance" residual was a small negative.

[28] Acharya, V. et al., (2013), "Corporate Governance and Value Creation: Evidence from Private Equity," *Review of Financial Studies,* 26 (2), pp.368–402.

[29] Note: this figure is stated before management fees and carried interest but after other fees such as portfolio company fees. It also ignores any impact from currency or from dilution by equity owned or earned by Company A managers and employees.

[30] Assumes a 3 percent dividend yield. The return on an alternative comparable, the relevant sector index, was very similar at 19.0 percent.

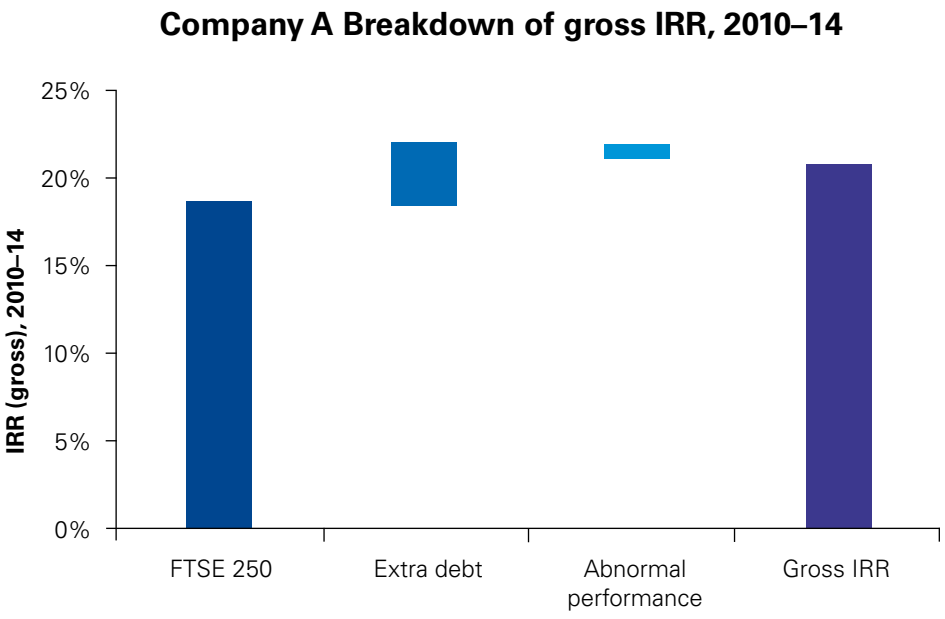
Table 4 Company A, 2010-14: Breakdown of gross IRR

	IRR	Contribution
Return from market sector (FTSE 250)	18.7%	87%
Return from extra debt	3.6%	17%
Abnormal performance	**–0.7%**	**–3%**
IRR (gross)	21.6%	100%

Source: company reports, author analysis

Chart 2 gives a more meaningful picture than Chart 1 of where the return in Company A really came from. The value bridge implied that most of the £569 million profit on the deal came from the buyout manager running the company better. By using more sophisticated analysis, a different story emerges. It goes like this. UK midcap companies more or less doubled in value between March 2010 and March 2014.[31] That equates to an annualized return of around 19 percent. LEF essentially surfed that stock market wave, boosting the return a little by using extra debt. Whether by skill or luck, LEF's combination of market timing and stock

Chart 2 Company A, 2010-14: Breakdown of gross IRR



Source: company reports, author analysis

[31] Based on total return, assuming a 3 percent dividend yield.

picking in Company A was good. Its financial engineering skills added a small boost. "Abnormal performance" from running the company better was essentially zero.

This way of looking at the return on Company A throws a different light on how much buyout managers get paid. Once again, the analysis will have to be hypothetical. Suppose LEF's investors are paying a standard, generic 2-and-20 fee structure: that is, 2 percent per annum of capital invested, plus 20 percent of profits over and above an 8 percent hurdle rate. Based on those assumptions, total investor costs will be about 3.6 percentage points out of the 21.6 percent gross IRR.[32]

Table 5 shows that deducting those costs will reduce the investors' net return back down to 18.0 percent, less than the 18.7 percent gross return on the stock market:

Table 5 Company A, 2010-14: Estimated net IRR

	IRR/return
Return from market sector (FTSE 250)	**18.7%**
Return from extra debt	3.6%
Abnormal performance	–0.7%
Company A IRR (gross)	**21.6%**
less: fees and carry	–3.6%
Company A IRR (net)	**18.0%**

Source: company reports, author analysis

This comparison needs one further adjustment. Compared to quoted equities, private equity is a very illiquid investment: investors agree to their cash being locked up for as long as 10 years. For that reason, as well as arguably higher risk, most private equity investors say that net returns in private equity need to deliver a meaningful premium over the stock market.

[32] Source: author calculations. Assumes a full exit at the IPO price; 2 percent management fee on US$703 million (£506 million invested); and US$93 million (£67 million) of carried interest based on an 8 percent hurdle rate, net of 2 percent management fees.

Table 6 Selected investors: required PE return premium

Investor	PE investments	PE premium required over quoted equities	Source
CalPERS (California Public Employees Retirement System)	$32bn	3.00%	2014 Comprehensive Annual Financial Report, page 99 (NB appears to include a misprint; confirmed by pensions & Investments article, 10 December 2014)
CalSTRS (California State Teachers Retirement System)	$22bn	3.00%	2014 Comprehensive Annual Financial Report, page 136
Washington State Investment Board	$16bn	3.00%	2015 Comprehensive Annual Financial Report, page 108
Universities Superannuation Scheme (UK)	£4bn ("Private equity/debt")	0%–3.0%	2015 Report and Accounts, page 48 (NB refers to "Private equity and debt"; debt would normally be expected to earn a smaller premium.)
Yale University Endowment	$8bn	4.50%	2014 annual report, pages 10–12

Source: annual reports

While it is hard to find comprehensive figures on this, Table 6 shows that some of the world's largest investors in private equity require a premium over quoted equities of between 300 and 450 basis points in annual return:

Table 7 combines these observations to create a full comparison of the net return from Company A versus what investors expect from private equity. It assumes that a large investing institution would have to pay annual management fees of 0.5 percent to get exposure to the FTSE 250.

Neither Company A nor LEF is the true subject of this example. Private equity investors are typically exposed to a portfolio of 15 to 20 companies that a single private equity fund invests in, rather than one single company like Company A. Company A is used simply to show how the market-based approach to private equity value creation is more meaningful. At face value, the conventional value bridge (Table 2 and Chart 1) could be taken to suggest that the private equity manager, LEF, "created" US$651.9 million (£469 million) out of the US$790.9 million (£569 million) profit on Company A by increasing its profits and its valuation multiple between 2010 and 2014 while the remaining US$139 million (£100 million) of profit came from financial engineering.

The market-based approach (Table 4 and Chart 2) tells a different and more-meaningful story about Company A returns. It shows that almost nine-tenths of the gross return on the deal (18.7 percent out of 21.6 percent) came from an uplift in the stock market. Decisions taken by LEF and its operating managers played a role in this part of the return. But they created no incremental value, since they did not outperform their peers; the economic pie did not become bigger than it otherwise would be. Using extra debt boosted the return by about 3.6 percentage points, but this does not involve creating value, either — it resulted from bearing additional risk.

The third component of the return, abnormal performance — which could reflect value creation by private equity — was in this case a small negative. It reduced the overall return by about 0.7 percentage points, taking the gross IRR to 21.6 percent.

On a gross basis, this is about 2.9 percentage points higher than the FTSE 250. But the high underlying stock market return triggered some carried interest on the deal, so that in total fees and carried interest may have cost 3.6 percent p.a. This reduced investors' net return back down to 18.0 percent.

A net return of 18.0 percent on Company A is close to the net return on the FTSE 250 (18.2 percent, assuming management fees of 0.5 percent). But since private equity investors generally say they need to earn at least three percentage points more than on quoted stock markets, the required net return on Company A was 21.2 percent (that is, 18.2 percent plus 3 percent). So although investors received a relatively high net return on Company A (18.0 percent), that net return saw no value being created. It was also about three percentage points below what they needed to receive in order to justify investing in private equity in the first place, and was achieved using higher financial risk.

The scale of the difference between the stories that come from the value bridge and from the market-based approach shows how important it is to understand where the return on a buyout really comes from.

Table 7 Company A, 2010–14: estimated IRR vs. required return

	IRR return
Return from market sector (FTSE 250)	**18.7%**
Return from extra debt	3.6%
Abnormal performance	–0.7%
Company A IRR (gross)	**21.6%**
less: fees and carry	–3.6%
Company A IRR (net) [A]	**18.0%**
Required return, net	
Return from market sector (FTSE250)	**18.7%**
Less: assumed management fees	–0.5%
Return from market sector (FTSE250), net	**18.2%**
plus: required PE premium	3.0%
Required return, net [B]	**21.2%**
Company A out/(under) performance of required net return [A-B]	**–3.2%**

Source: company reports, author analysis

Who uses the market-based approach?

The market-based measure of private equity value creation is more complicated than the value bridge but more informative. That helps to explain why academic research generally ignores the value bridge.

Although the market-based approach to private equity returns is consistent with standard economics and finance theory, until recently it does not appear to have played much of a role within the everyday practice of the private equity community. As noted previously, comments in the public domain generally refer to the conventional value bridge, IRR or cash multiples. Acharya et al. note that their 2013 paper, whose first draft is dated 2008, breaks new ground in the academic literature.

One of the few organizations using this superior approach today was an early adopter. In 2009, a fund of funds called Capital Dynamics (assets under management/advisement: US$19 billion) issued a presentation that clearly identified a shortcoming of the value bridge.[33] "Paying down debt (de-leveraging) is frequently mentioned as a value driver in the private equity industry, albeit the generation of the required cash flows being the true value driver," it said. "In this context, de-leveraging and the leverage effect are often mixed up."

Another organization that deserves credit for using the market-based approach is the BVCA (British Private Equity and Venture Capital Association), in its annual Walker reviews. It may seem odd that the BVCA uses the market-based approach, while many of its private equity firm members still tend to use the value bridge.

Joe Steer, head of research at the BVCA, explains: "We … use the methodology that we do because it allows us to make the case for outperformance in the industry as a whole, whereas investors are interested in the value bridge because it shows on a cash-on-cash basis where the return is coming from."

This implies that the market-based approach and the value bridge measure the same thing. But as this article has shown, there are subtle but crucial differences between them. That means their results can provide widely differing views of what happened in a buyout. It is important for investors to understand that the conventional value bridge and the market-based approach measure different things and can produce very different results.

One possible sign of change relates to the fund of funds group, Pantheon. As noted previously (footnote 13), in September 2013, Pantheon published a brief document called *It's the Alpha, Stupid!* that describes the classic value bridge and suggests that it identifies "value creation" and "alpha."

Pantheon has subsequently issued a longer document called *Value Creation and the Business Cycle,* dated October 2015.[34] After describing the value bridge, this new document says: "But this accounting identity is misleading, because it doesn't actually tell us much, if anything, about value creation." Pantheon's October 2015 document goes on to describe what is essentially the market-based approach derived from the article by Acharya et al.

[33] Capital Dynamics and the Centre for Entrepreneurial and Financial Studies, Technical University of Munich (2009), *Value Creation in Private Equity*, November 2009.

[34] Pantheon Ventures, *Value Creation and the Business Cycle,* October 2015, available at http://www.pantheonventures.com/news-publications/630-replicating-investment-strategy

Conclusion

Private equity firms sometimes run companies better in ways that last. When they do so, they genuinely "create value" — meaning they make the overall economic pie bigger than it otherwise would be. That is genuinely valuable to the economy.

But buyout firms may generate positive returns in several ways. They may see a company's profits increase in line with those of its peers. They may be successful at market timing or stock picking. Such returns are real enough: they will help a pension fund investor, for example, meet its obligations over time. These returns may also reflect manager skill, though distinguishing skill from luck in this area is hard. Similarly, the returns generated from financial engineering can also be real and often involve skill.

These sources of return are less valuable, however, than the ones that come from true "value creation." Increasing a company's profits in line with its peers' does not justify extra fees. Market timing, stock picking and financial engineering may be hard for either an individual private equity firm, or the private equity community as a whole, to sustain indefinitely. Financial engineering, in particular, needs lenders which are prepared to play their part. It remains an open question whether the debt that buyout firms use has been correctly priced across time and through cycles. Even if debt has been fairly priced, using it (other things equal) adds risk to the equity returns achieved and this must be factored into the returns investors demand. (This may be one reason for the premium that investors demand in their net returns, see Tables 6 and 7.) Buyout debt has been plentiful, most of the time, for a generation now but this may not continue indefinitely.

Discussion of buyout firms' market timing and stock picking also generally overlooks a key point. The classic private equity fund structure makes it relatively easy for buyout managers to take advantage of market timing and stock picking views. That is because private equity investors give buyout managers a 10-year commitment. This lock-up makes it easier for a buyout firm to buy when other investment managers must sell to meet redemptions, and vice versa. In effect, the standard private equity investment structure sees private equity investors grant buyout firms a valuable option. In return for helping buyout firms in this way, private equity investors should arguably pay buyout firms less for returns from market timing and stock picking than they pay to more conventional investment managers.

These are among the reasons investors and policy makers should seek a clear view of how buyouts truly "create value." Investors are paying buyout firms high fees to create value. If private equity's value creation is not being measured in the right way, then investors cannot know if what they pay buyout firms is appropriate.

As long ago as 2000, one of the world's most-respected private equity investors,

the Yale endowment's David Swensen, warned that the private equity community risked failing to distinguish true value creation from overall profits:

> A contributing factor to the dramatic difference between the poor result for the limited partner and the happy outcome for the general partner lies in the inappropriate deal structure typical in private equity limited partnerships. **Paying 20 percent of the profits to the general partner instead of 20 percent of the value added** drives a meaningful wedge between the results for the general and limited partners. [Emphasis added.][35]

In 2009, Watson Wyatt Worldwide (now part of Towers Watson) wrote about the same problem.[36] It observed that since "private equity is essentially a long-only investment with additional leverage applied," it is relatively easy to measure true "alpha." On an illustrative basis, Watson Wyatt found that under existing fee structures, "approximately 60 percent of the alpha generated is paid to the GP, far too high a proportion for the disproportionate amount of risk being taken by the [investor]."

In 2011, the World Economic Forum published a report called *The Future of Long-term Investing*.[37] The report's academic research was supervised by Harvard University's Josh Lerner. It included this observation about private equity:

> The conclusion from these and related studies is that [private equity] general partners [i.e. buyout firms] are skilled enough in deal selection to generate attractive gross returns. However, due to a variety of factors, the industry has been organized so that most of the rents (profits) from these skills go to the fund managers themselves, rather than to the limited partners [i.e. investors].

Observations like these raise doubts about how well the private equity community has historically measured true value creation. The results may be damaging for investors.

Private equity's standard value bridge is accurate in terms of mathematics and accounting. It is useful in a limited way for analyzing some aspects of the profits from a buyout. What it does not do is show the true economic sources of value added in a buyout.

Company A is just one worked example, when what really matters to investors is the performance of an overall fund or of private equity as a whole. But Company A shows how the failure to distinguish between overall profit and true private equity value creation can allow buyout firms to be well paid, relative to the value they create. In this one deal, the buyout firm created essentially no value (strictly speaking, negative 0.7 percent per annum). Yet the standard private equity fee structure saw it getting paid 3.6 percent per annum, which included some carried interest.

Another way to look at Company A takes us back to the beginning of this article. Despite creating no value on this deal (on the definition used in this article), the buyout firm received about a sixth of the deal's gross return (3.6 percent out of 21.6 percent). This is a smaller proportion than the one-quarter to one-third that big buyout firms have historically earned (Table 1). That simply reflects the fact that this is only one transaction, where Table 1 reflects many transactions across long periods. As both Swensen and Towers Watson point out, what really matters is the relationship between the rewards that managers receive and the true value they create. This particular example shows how existing fee structures mean investors can end up paying their private equity manager a disproportionately high percentage of the value it created.

The market-based approach to measuring buyout returns described in this article is not perfect but at least tries to reflect economic reality. Investors should treat private equity's value bridge with the caution it deserves. They should insist on the market-based approach. Getting a clearer view of where private equity returns really come from would help investors negotiate more appropriate fee structures. In turn, that would help investors retain a more appropriate share of any value that buyout firms create by deploying investors' capital.

[35] David Swensen, *Pioneering Portfolio Management*, Simon & Schuster, 2000, page 232

[36] Watson Wyatt Worldwide, Private Equity Fees and Terms, originally published September 2009, republished in A fairer deal on fees — Our thoughts on alignment of manager fees, 2011.

[37] World Economic Forum, *The Future of Long-term Investing,* 2011, page 62.

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