Analyzing Private Equity Value Creation Strategies

by

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Introduction

Private Equity ("PE") as an asset class manages close to $3 trillion as of 2018, which is roughly two-fifths of global alternative assets under management[1]. Unlike their Venture Capital peers, PE firms engage primarily in later-stage corporate investments, with a much higher degree of control over target companies' activities. The most commonly used strategy is leveraged buyout (LBO) where PE firms ("financial sponsors") acquire private or public companies by levering-up the target's balance sheet, make operational improvements during the multi-year holding period to generate sufficient free cash in order to pay-down debt, and then exit the investment either through an Initial Public Offering (IPO), or by selling it to a strategic or financial buyer. The ability to maximize returns using not only the target's cash flows but also the balance sheet is unique to the PE asset class.

Investment vehicles are organized as partnerships comprising of General Partners ("GP") and Limited Partners ("LP"). GP represents the financial sponsor, which contributes roughly 1-2% of a fund's total equity, with the remaining share coming from LPs. This structure ensures that the GP has a stake in each investment, reducing the risk of irrational investment decisions. Financial sponsors receive a management fee of around 1-2% of committed capital to cover their expenses, and 20% of the fund profits. The limited liability fund structure also shields the GP from any liability exceeding its equity share in transactions.

Although the concept of LBO has existed since the buyout of Carnegie Steel in 1901, the first LBO boom took place in the 1980s. During a span of a decade, there were 2,000 LBOs worth

[1] "Private Equity Firms See Assets under Management Approach $3 Trillion Mark." *ConsultancyUnited Kingdom*, 8 Mar. 2018, www.consultancy.uk/news/16266/private-equity-firms-see-assets-under-management-approach-3-trillion-mark

over $250 billion in enterprise value (equity contributed plus net debt)[2]. This tremendous growth was financed by the rise of the high-yield debt market, which collapsed in 1990 due to the failure of its lead underwriter, Drexel Burnham Lambert, as well as increased default rates driving higher interest rate spreads on junk bonds. LBOs in the 1990s markedly shifted more towards operational levers for value creation. The bear market phase from 2000 to 2003 put a brief pause on buyouts. As interest rates decreased to drive economic recovery, PE firms reverted back to levering-up target companies, thus resulting in a so-called "Golden Age of Private Equity". The relaxed lending standards by banks and the housing market crash contributed to the financial crisis in 2008, causing a complete lockdown of the debt markets. Although interest rates were close to 0% from 2009 to 2016, Dodd-Frank regulation restricted leverage on deals between 6-6.5x pro-forma EBITDA (Earnings before Interest, Taxes, Depreciation and Amortization), thus forcing PE firms to contribute higher equity checks, representing roughly 40-50% of transaction value. This higher proportion of equity was also influenced, in part, by the higher valuations being paid.

Despite PE firms drifting to an operational improvement strategy, naysayers often highlight the excessive use of leverage and quest for outlandish returns as value destroying activities for portfolio companies. Easy access to leveraged finance capital markets has led to debt multiples increasing from 3.5x in 2000 to 5.8x in 2017[3]. Although this increase in use of credit helps boost IRR, the increased level of risk coupled with rising debt costs endangers the future of portfolio companies, even leading to bankruptcies in some cases. Critics claim that most GPs look to generate returns through capital structure changes and that sponsors have benefitted from multiple expansion provided by a prolonged bull market.

[2] Opler, T. and Titman, S. "The determinants of leveraged buyout activity: Free cash flow vs. financial distress costs." Journal of Finance, 1993.

[3] "The State of the US PE Industry in 13 Charts." *PitchBook*, pitchbook.com/news/articles/the-state-of-the-us-pe-industry-in-13-charts.

This paper focuses on how sponsors create value throughout the lifetime of a buyout deal. Due to paucity of data on private buyouts, the research focuses on public-to-private-to-public (PPP) transactions, i.e. public companies that were taken private by sponsors and then later exited through an IPO. It categorizes LBO returns into three overarching buckets – operational performance, debt repayment and multiple expansion, which are further subdivided. Although there has been a plethora of literature on value creation strategies, this research aims to formulate a unique model that segregates value generated due to changes by the financial sponsor from the return that would have been generated if the company had not engaged in leveraged buyout. This model is then tested across a sample set of 204 transactions from 1980 to 2018. In order to assess the shift in value creation strategies over the years, the sample set is grouped by different credit cycles. The analysis also reveals how sponsors choose between investing cash flow in operational improvements versus paying down debt to improve capital structure in different credit environments, offering a novel Hurdle Rate Test to determine optimal use of cash. Based on these results, a suggestion is drafted to help PE firms sustain returns, given the expected rise in interest rates.

Literature Review

Private equity has been a mystified asset class that has been the center of a lot of research historically. A commonly explored topic is whether the PE asset class outperforms its peers. This is analyzed on two main fronts – performance of PE portfolio companies after the sponsor exits the investment and performance of portfolio companies during the holding period.

Aftermarket performance research has focused on both the fundamental operational improvements and stock price returns of portfolio companies after their Initial Public Offering ("IPO"). Cao and Lerner (2009) analyzed a data set of 496 Reverse Leveraged Buyouts ("RLBO"), i.e. public companies that were taken private and then re-listed on the public markets, from 1980 to 2006. The paper determined that RLBOs outperform other IPOs consistently and that growth in the buyout market does not have any reasonable effect on these returns. Larger companies, backed by PE firms with higher AUMs, yield relatively higher returns than other RLBOs. The paper also found that re-listings within one year of a business going private underperform the market. Mario Levis (2010) conducted a similar analysis on 204 PE-backed IPOs on the London Stock Exchange, finding that sponsor-backed public listings are significantly underpriced compared to other IPOs and outperform the market over a 36-month aftermarket period. DeGeorge and Zackhauser (1993) found a decrease in accounting performance of companies post-IPO, based on a sample set of 62 RLBOs.

Research on holding period performance of companies has focused on classifying returns into three primary buckets – operational improvements, multiple expansion and debt repayment. Guo, Hotchkiss and Song (2011) examined buyout deals from 1990 to 2006 and concluded that these transactions were much more conservatively priced and less levered than the first LBO boom. They compared change in EBITDA and cash flow margin profile of the LBO sample set with a set

of comparable companies to determine if the buyouts outperformed their peers. This peer-adjusted metric results in less gains for LBOs from 1990-2006 than the 1980s buyouts, which is shown by Kaplan's research (1989). Guo also used a regression approach to determine total return contribution by each value driver. Acharya (2010) analyzed 395 European buyout deals by un-levering equity returns based on average cost of debt and debt to equity ratio, thereby separating operational performance from financial leverage returns. His paper showed that EBITDA margin expansion and revenue growth are key drivers of Internal Rate of Return ("IRR").

Several value bridge templates have been created drawing on the foregoing research. One of the most comprehensive ones is the Parthenon model, which used Acharya's formulation to un-lever returns and then found operational alpha by comparing capital structure neutral IRR to beta-adjusted un-levered sector returns. Pindur (2007) deconstructed returns into five components – EBITDA variation, multiple variation, combined effect, cumulative interim Free Cash Flow ("FCF") generated and transaction costs.

Although these deconstructed formulas are informative about the different levers sponsors use, it does not breakdown the value created due to a PE firm's involvement versus value that would have been generated without any involvement. Moreover, despite previous literature acknowledging the role of leverage to reduce equity check size and consequently boost returns, this factor has not been quantified. This paper hopes to fill in these gaps by deriving a novel formula to categorize LBO returns and then use it to analyze a sample set of 100 pure RLBOs across different credit cycles.

Thesis

In the early days of bootstrap investments, sponsors heavily relied on debt financing. In fact, the famous RJR Nabisco deal was capitalized with 87% debt and only 13% equity[4]. With Milken's leveraged finance market booming in the 1980s, financial engineering, which includes encumbering target companies with multiple tranches of debt, creating complex holding and subsidiary company structures to maximize use of leverage and pursuing dividend recap transactions, was the name of the game. An influx of GPs into the LBO business increasingly commoditized financial engineering and resulted in a steady increase of deal valuations, thus leading to sponsors focusing more on improving fundamental operations of a company to achieve top quartile returns. Although the 2008 financial crisis saw bank financing being heavily regulated, PE firms looked to take advantage of the extremely low interest rate environment and easy availability of equity capital through record high fundraises.

Hypothesis I: Although sponsors have taken initiatives to build operational groups focusing on driving returns through fundamental improvements, value-created due to sponsor involvement has only marginally contributed to returns, with financial engineering still being a significant PE firm value-add in a leveraged buyout transaction.

One of the critical decisions during the holding period is the use of internally generated cash. Sponsors can use portfolio company cash flow from operating activities to either reduce

[4] "KKR Reveals Financing for RJR Nabisco Deal." *UPI*, UPI, 2 Dec. 1988, www.upi.com/Archives/1988/12/02/KKR-reveals-financing-for-RJR-Nabisco-deal/6153597042000/.

leverage or reinvest to grow the business. Building on the previous hypothesis, this paper also seeks to analyze the use of cash flow in different credit cycles and highlight any cases of misallocation.

Hypothesis II: In a high interest rate environment, it is optimal to use cash flows to paydown debt since the hurdle rate for internal projects is higher. Conversely, sponsors generate higher cash flows in a low interest rate environment and are more inclined to reinvest due to a lower hurdle rate. In scenarios where PE firms differ from the optimal cash use as suggested by the Hurdle Rate Test, returns are considerably lower.

Data Sample

This paper examines pure RLBOs – public companies that were acquired by PE firms and then taken public again. Professor Josh Lerner and Professor Jerry Cao's extensive list of LBO transactions was used as a primary reference point. The list provided the CUSIP number, company name, IPO date and LBO date for 594 transactions from 1976 to 2005. Thomson One's SDC Platinum platform was also used to gather information on all public-to-private LBOs in the United States from 1980 to 2018 as well as all IPOs on the New York Stock Exchange ("NYSE") or NASDAQ during the same time frame. These two lists from Thomson One were then compared against each other to identify public-to-private-to-public ("PPP") transactions. A similar process was used to compile a list from S&P CapitalIQ. These databases, however, provide an incomplete LBO list in earlier years. *Mergers and Acquisitions* magazine and Wall Street Journal articles were used to fill in the gaps.

The comprehensive list was then scrubbed to identify pure RLBO transactions. Capital IQ's Compustat was then used to gather financial information on these companies, mainly Revenue, EBITDA, Long-term Debt, Cash & Cash Equivalents, Capital Expenditure and Depreciation & Amortization. SDC Platinum was cross-referenced with the existing RLBO database to find purchase and sale prices and EBITDA multiples. Furthermore, news articles (primarily from *Wall Street Journal* and *New York Times*) were extensively used to find deal data. Any transaction with a missing piece of information was excluded from the database. This resulted in a final list of 204 transactions from 1980 to 2018. Compustat was also used to classify each transaction into a specific industry using the NAICS code. This code was then used to obtain historical revenue growth figures for each company in each NAICS industry from 1980 to 2018. Sum of Revenues per NAICS code was used to compute historical growth numbers. Note that this

industry data does not control for reclassification of companies as they might expand into different sub-verticals.

The transactions were classified into 4 different time periods, which represent different credit cycle environments. Note that deals were categorized based on initial LBO date – 38 deals from 1980-1989, 94 from 1990-1999, 67 from 2000-2007 and 5 from 2008-2018. This implies that transactions which were executed in one cycle but IPOed in a different one are included in the time period in which they were bought out.

Formulation

I. Value Creation

Increase in equity value, in its simplest form, is the difference in enterprise value ("EV") at the time of exit and entry, plus the reduction in net debt value and any interim cash flows.

I. Operational Effect without Sponsor

$$EBITDA_{exc.sponsor} = Revenue_0 \times (1 + industry\ growth)^n \times EBITDA\ Margin_0$$

It is important to differentiate EBITDA that would have been generated without any sponsor involvement. To estimate this, revenue at the time of entry is grown at the industry-specific growth rate. Although industry-level topline growth affects EBITDA margins due to inherent operating leverage, no margin expansion is factored in due to lack of data on cost-structure of companies (with the result, the operating leverage effect cannot be quantified).

$$\left[\frac{EBITDA_{exc.sponsor} \times EBITDA\ Multiple_0}{EBITDA_n \times EBITDA\ Multiple_0}\right] \times [\,(EBITDA_n - EBITDA_0) \times EBITDA\ Multiple_0]$$

This equation shows the EV contribution had the company not engaged in any LBO. First, the proportion of terminal year EV without any sponsor involvement is calculated. EBITDA without any sponsor engagement (as calculated above) is multiplied with the entry multiple, implying no change in cash flow quality at exit. This is then divided by the EV at terminal year assuming constant multiple. Second, this ratio is multiplied with the actual operational improvement in EBITDA assuming no multiple change.

II. Operational Effect due to Sponsor

$$\left[\frac{(EBITDA_n - EBITDA_{exc.sponsor}) \times EBITDA\ Multiple_0}{EBITDA_n \times EBITDA\ Multiple_0}\right] \times [\,(EBITDA_n - EBITDA_0) \times EBITDA\ Multiple_0]$$

This equation calculates the EV contribution due to sponsor involvement. EBITDA due to changes initiated by the financial sponsor is estimated by the difference between exit year EBITDA and $EBITDA_{exc.\ sponsor}$. The proportion of value generated by PE firm is calculated using a similar method as discussed in the previous equation.

III. Multiple Effect

$$(EBITDA\ Multiple_n\ -\ EBITDA\ Multiple_0) \times EBITDA_0$$

This evaluates the improvement in multiple either through an improvement in the cash flow profile of the operating company or due to bidding dynamics.

IV. Combination Effect

$$(EBITDA_n\ -\ EBITDA_0) \times (EBITDA\ Multiple_n\ -\ EBITDA\ Multiple_0)$$

The previous two sets of formulas individually hold EBITDA multiple and the absolute amount of EBITDA as constants. However, the two also change simultaneously during the holding period. This effect is calculated using the above equation.

V. Leverage Effect

Leverage is a key component of the value bridge model. It is used to generate returns through debt reduction and minimizing equity check size at LBO close.

$$(Net\ Debt_0\ -\ Net\ Debt_n)$$

Net debt reduction is calculated as the difference between the values at exit and entry. Companies might either use free cash flow to reduce debt or might let it accumulate on the balance sheet earning a small cash interest. Debt netted out for cash takes into account both of these uses of cash.

II. Hurdle Rate Test

As the portfolio company generates annual cash flow, sponsors must decide whether to reduce debt or reinvest in the business. Paying down debt increases pre-tax income for subsequent years by amount of debt reduced (which equals cash flow from operations, assuming that sponsors choose to use discretionary cash post mandatory debt repayment to further reduce leverage. In other words, 100% cash flow sweep) times interest rate, given all else is equal. Hence, the internal project should increase Earnings before Tax ("EBT") by at least the same value for it to be feasible. If cash is reinvested in the business, the amount of interest expense stays constant for the following year. Hence, required absolute increase in EBT is the same as required absolute increase in Earnings before Interest and Taxes ("EBIT") or Operating Income.

Thus, breakeven incremental revenue can be expressed by the following equation:

$$Incremental\ Breakeven\ Revenue = \frac{Cash\ Flow\ from\ Operations \times Interest\ Rate}{Operating\ Income\ Margin}$$

Every incremental dollar in operating income results in higher incremental enterprise value due to the multiple effect. For example, if reinvestment generates an extra dollar of profitability and the relevant financial metric sale multiple is say 10x, the additional EV is 10 times the extra dollar. Hence, the effective incremental revenue required to be indifferent between the two uses of cash flow is much lower than previously calculated due to this magnifying effect

$$Incremental\ Breakeven\ Revenue\ Adjusted = \frac{Incremental\ Breakeven\ Revenue}{Exit\ Multiple}$$

Required revenue growth rate can be calculated by comparing incremental revenue with previous year's revenue. Note that this rate needs to be added to the industry growth rate as the incremental revenue calculated above is on top of what the company would grow at without any sponsor involvement.

$$Hurdle\ Rate = Industry\ Growth\ Rate + \frac{Incremental\ Breakeven\ Revenue\ Adjusted}{Revenue_{n-1}}$$

P.S: Interest Rate is defined as LIBOR + Spread. The credit spread is obtained by assuming a financing structure of two-thirds Term Loan (bank debt) and one-third High Yield (bond debt).

Note that this hurdle rate does not consider cost of equity since, unlike public companies, financial sponsors do not have the option to payout an equity dividend unless covenants allow the same in specific situations. The formulation also does not take into account the qualitative benefit of reduced financial risk from delevering a company.

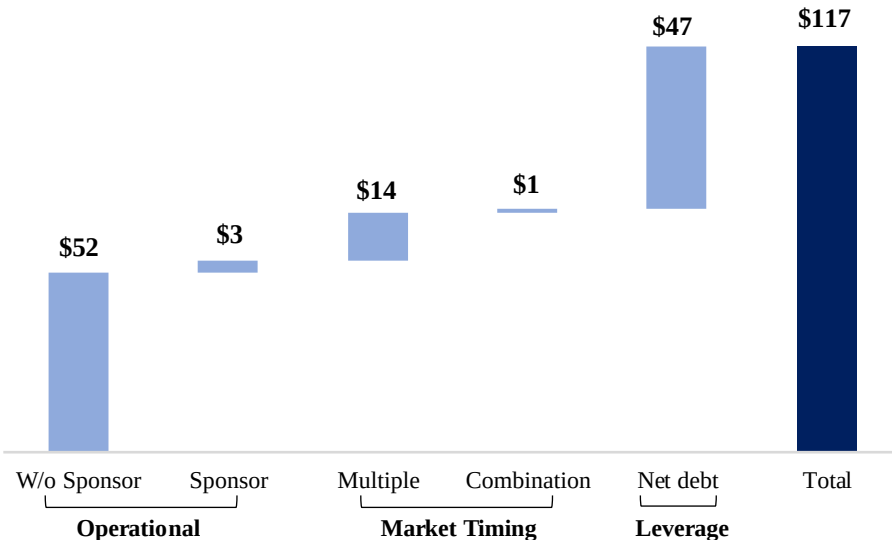
Results

I. Value Creation Analysis

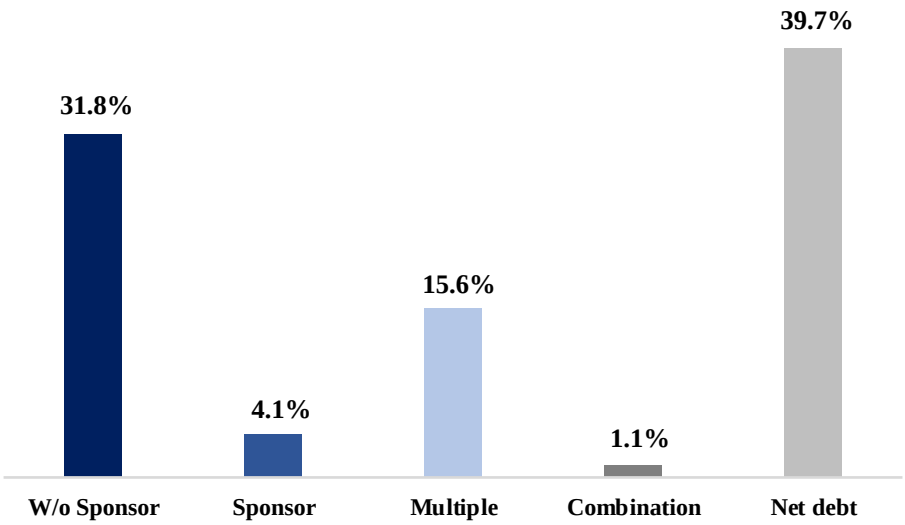
As mentioned above, value created in each transaction is segregated into five main buckets – operational value created without any sponsor involvement, operational value created due to sponsor involvement, multiple effect, combination effect and net debt reduction. These buckets can also be grouped by non-sponsor related drivers, which includes value created without sponsor involvement and multiple effect, and sponsor-related drivers, which includes value created by sponsor and net debt. Combination effect is excluded as it is a mix of both sponsor-related and non-sponsor related activity.

This is analyzed across each time period and the results are as follows.

I. 1980-1989

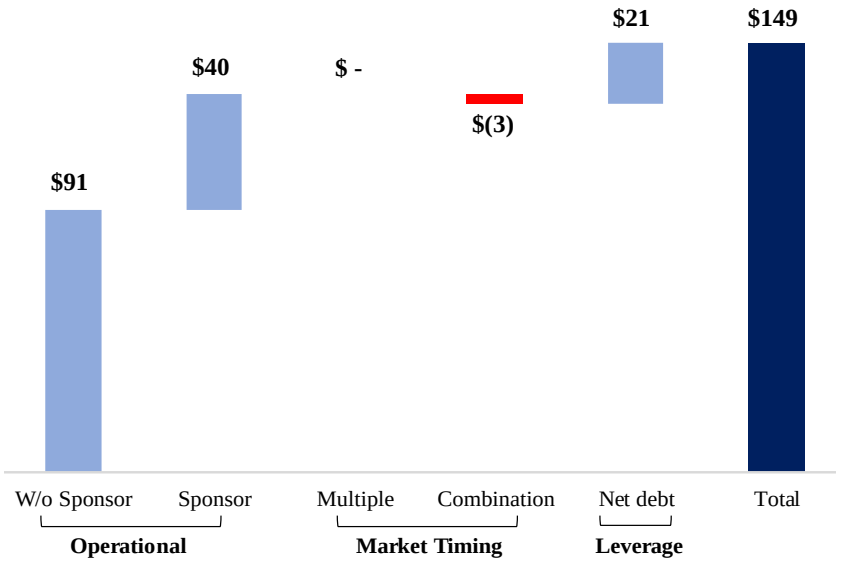


The above graph shows the nominal median equity value created for all 38 RLBOs from 1980-1989. It is evident that non-sponsor related drivers, totaling $66 million, generated more value than sponsor-related factors, totaling $50 million. Moreover, under the operational improvement umbrella, sponsor contribution was negligible.

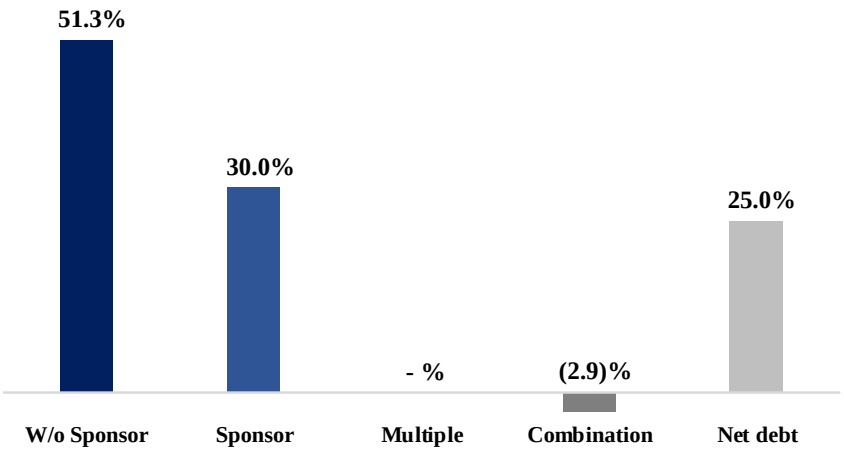


Total operational improvement contributed 35.9% of median returns versus 39.7% contribution by net debt reduction. There is a discrepancy between the highest value generator on a nominal versus proportional basis is because net debt reduction contributed a lower amount for larger denominated deals than operational improvements. This shows reliance on debt paydown by sponsors during the early years of leveraged buyouts. The rationale for such a phenomenon can be explained by the easy availability of leverage to finance deals and high interest rate on debt, thus making it lucrative to reduce the debt load to save cash spent on interest expense.

II. 1990-1999

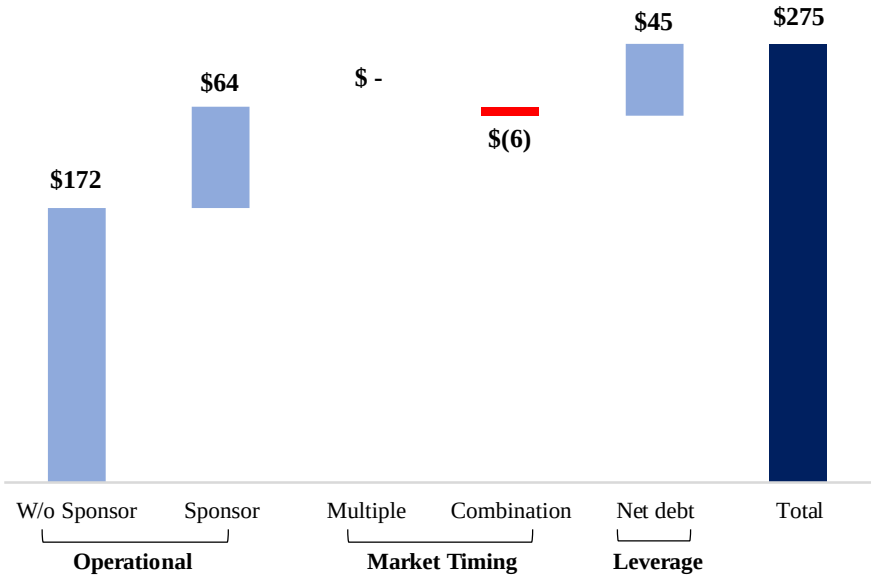


The above graph shows the nominal median equity value created for all 94 RLBOs from 1980-1989. In this time period, too, non-sponsor related drivers, totaling $91 million, generated more value than sponsor-related factors, totaling $61 million. Unlike the previous cycle, contribution due to sponsor involvement was higher at 31% of total operational improvements. During this period, PE firms started establishing and aggressively developing their operational arms, which focuses provides in-house consultancy services aimed to optimize portco efficiency and boost profitability.

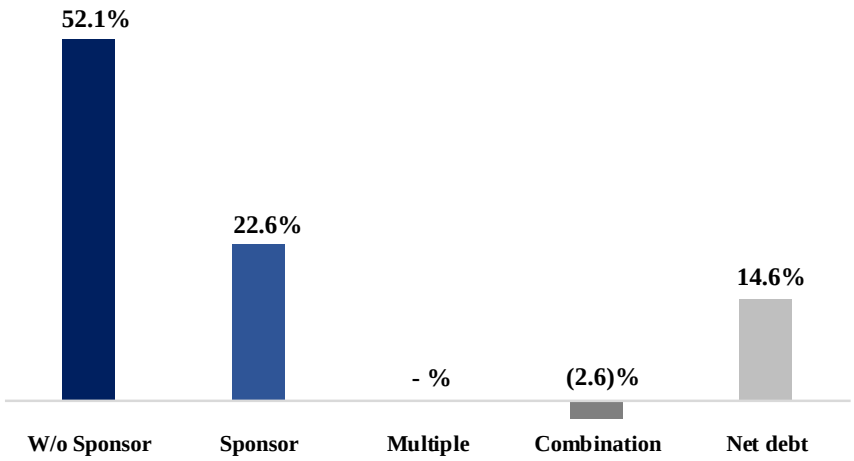


The top two drivers in this period, too, were operational improvements and net debt reduction, contributing 81.3% and 25% respectively. Market timing had negligible contribution to returns. This is because a public-to-private acquisition requires sponsors to pay a control premium in excess to the already existing liquidity premium of a public company. However, while exiting through IPO, the sponsor is only able to get liquidity premium. This period shows reduced reliance on financial engineering, albeit it still being a significant value generator.

III. 2000-2007

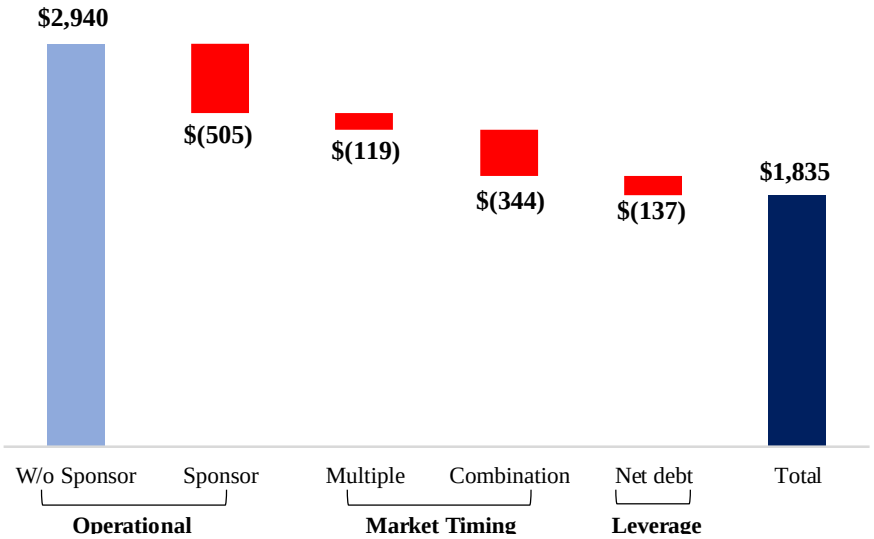


Nominal median equity value created for 67 RLBOs from 2000-2007 is shown above. Non-sponsor related drivers, totaling $172 million, again generated more value than sponsor-related factors, totaling $109 million. Sponsor operational value-add as a proportion to total operational value decreased to roughly 27%. Total value contribution is much higher than previous periods reflecting the “Golden Age of Private Equity”.

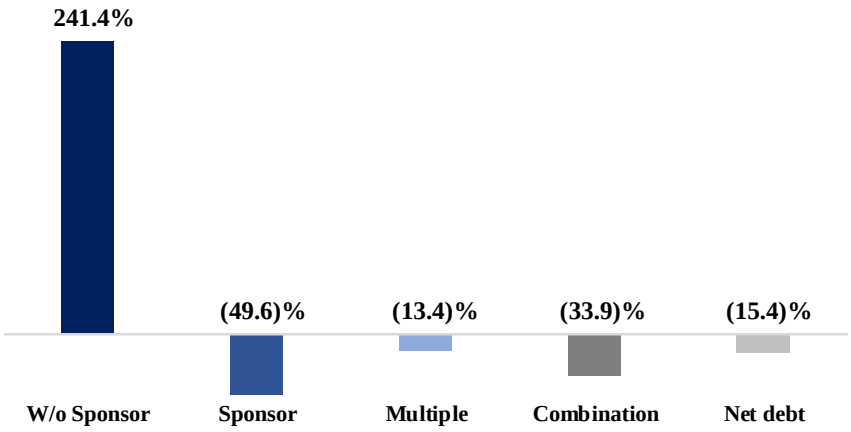


The top two drivers in this period were operational improvements and net debt reduction, contributing 74.7% and 14.6% respectively. Market timing had negligible contribution to returns due to control premium paid at buyout and also because a fair proportion of transactions in the sample had post-crisis exit. The continued shift from financial engineering to operational improvements is due to sponsors focusing heavily on reinvesting and growing profitability of companies. This represents a more sustainable source of value creation going forward.

IV. 2008 - 2018



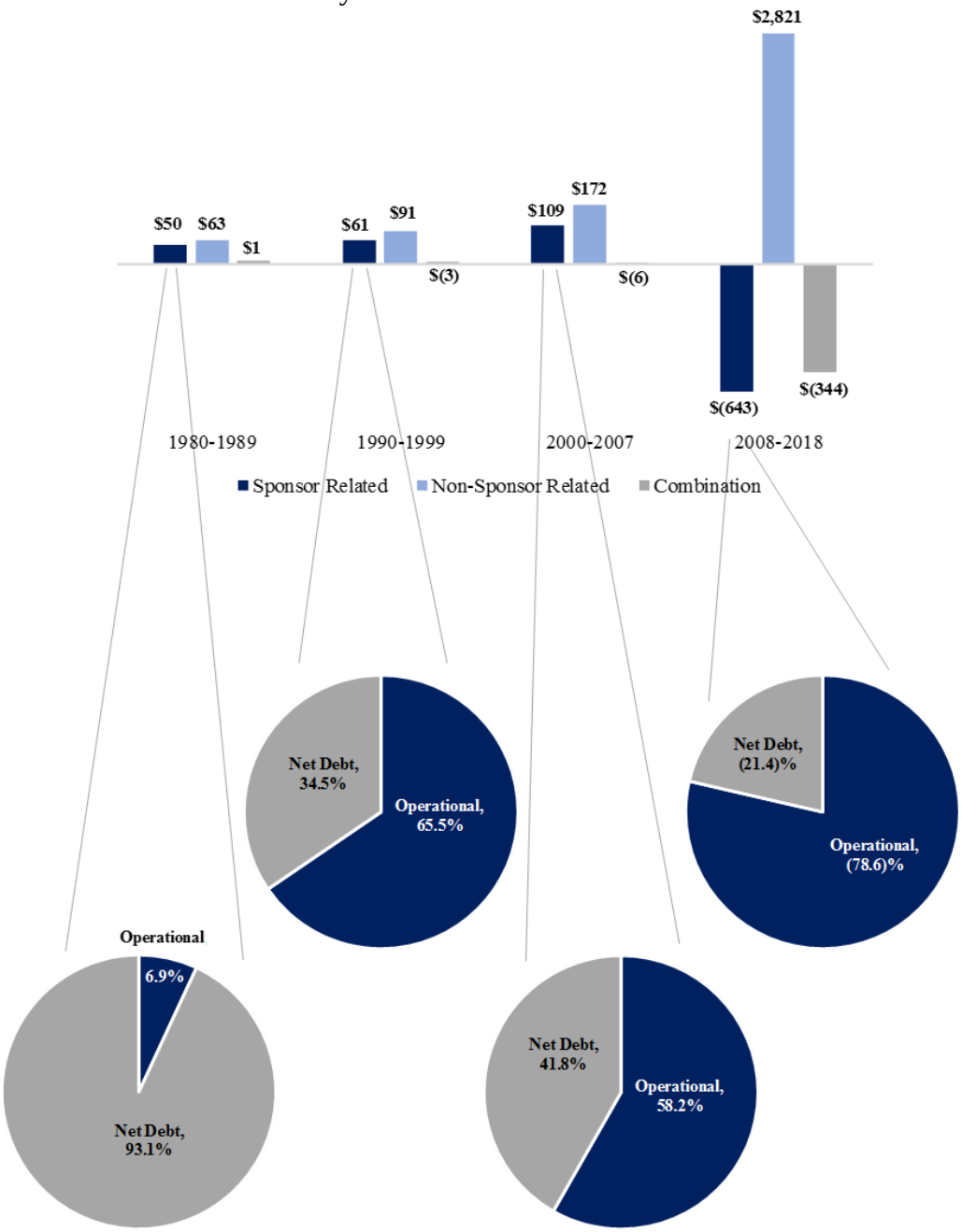
Nominal median equity value created for 5 RLBOs from 2008 onwards is shown above. Non-sponsor related drivers, totaling $2,821 million, again generated more value than sponsor-related factors, totaling -$642 million. Sponsor operational value-add as a proportion to total operational value was a negative contribution, or in other words, sponsors involvements destroyed value. Total value contribution is much higher than previous periods due to skewed results from mega transactions.



Operational improvement was the only positive contributor. Net debt increased during this period since a majority of the transactions in the sample set were financed with high equity check sizes as a proportion to EV due to the lack of supply in the credit markets post-crisis. Note that these results might not be as representative due to lack of data points.

Across all time periods there is a continued shift away from debt reduction to improving the quality of portco cash flows through operational improvement. Although this is a more sustainable and significantly more profitable means of generating returns, it is evident from the results that sponsors have not actively contributed much within the operational umbrella. In fact, of the 204 total RLBOs, sponsor involvement has led to value destruction in 46 cases and negligible contribution (<10% of total operational value creation) in another 37 transactions. In other words, in roughly half of the cases sponsors have barely created any value (such a probability

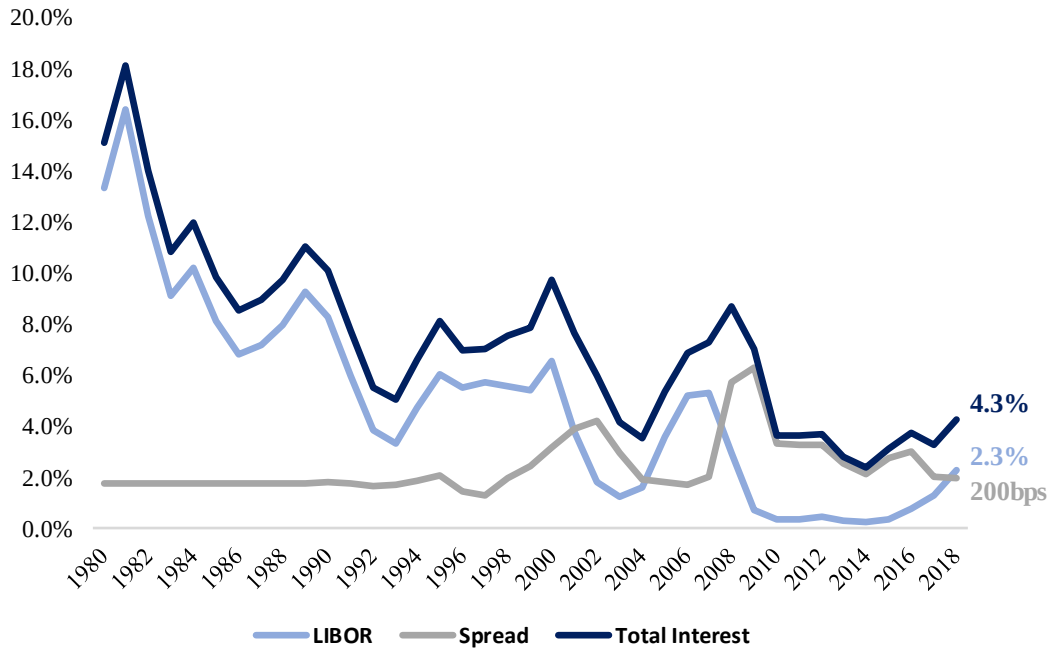
of value-add is the same as that of a coin flip). Hence, an argument might be made that despite the magnifying effects of topline growth on equity value, PE firms would be better-off focusing their resources on financial engineering. Reinvesting in the business carries a risk that projects might fail but paying down debt is a guaranteed and (counter-intuitively) the safest way to unlock equity value. The following is a summary graph that shows the breakdown of the value added by PE firms in LBO deals in different credit cycles.



This chart shows that financial engineering (debt paydown) was the largest contributor in the first credit cycle period analyzed. Although the proportion reduced in the next cycle it went back up in the "Golden Age". The most recent cycle has a negative contribution due to results being skewed from transactions where there was tack-on debt to finance acquisitions. As mentioned earlier, this chart does not adjust for the inherent risk associated with sponsor value-creation (50% chance that it adds negligible value). An expected-value evaluation (adjusting for risk) would lean towards financial engineering more significantly.

II. Hurdle Rate Analysis

As mentioned in the Formulation section, the Hurdle Rate helps determine the optimal use of cash. This rate has five main factors – amount of internal cash flow company generates from its operating activities, interest rate on debt, operating income margin, exit multiple, previous year's revenue and the expected industry growth rate for the holding period. The following chart shows how LIBOR and credit spreads have moved over time:-



Note: LIBOR was created in 1986, hence Fed Funds Rate is used for previous years

A PE firm can use portfolio company cash flow to either paydown debt, reinvest in the business or issue a dividend to equity holders. Due to paucity of information on debt structure covenants, it is assumed that the covenants do not allow dividends unless the existing LBO debt is completely paid down. This, therefore, leaves two optimal uses of cash– Reinvestment and Debt Paydown. The Hurdle Rate is meant to serve as a benchmark for PE firms to decide between these two choices. Reinvestment in the business is also assumed to generate topline growth, excluding any cost synergies the PE firm might execute.

If the expected revenue growth from capex exceeds the hurdle rate, which can be thought of as the minimum required revenue growth needed to be indifferent between ploughing back cash or repaying debt, then the firm should invest in value-creating projects. To determine the expected revenue growth at the time of the LBO, actual CAGR achieved during the holding period is used as a proxy. This, therefore, assumes that sponsor projections for the portco at the time of the LBO was exactly same as the topline growth achieved.

The foregoing steps resulted in the following breakdown of total transactions where it was optimal to reinvest versus repay debt across each of the four time periods. Note there are fewer transactions than the comprehensive RLBO list used to test the first hypothesis due to lack of availability of capex and D&A data.

Transaction Distribution		
1980 - 1989		
Reinvest	11	47.8%
Debt Paydown	12	52.2%
Total	**23**	**100.0%**
1990 - 1999		
Reinvest	39	76.5%
Debt Paydown	12	23.5%
Total	**51**	**100.0%**
2000 - 2007		
Reinvest	16	72.7%
Debt Paydown	6	27.3%
Total	**22**	**100.0%**
2008 - 2018		
Reinvest	3	60.0%
Debt Paydown	2	40.0%
Total	**5**	**100.0%**

The first phase of the analysis shows what the company ought to do given the calculated hurdle rate. The second phase, discussed below, shows how the company actually used its cash flow and whether there was any misallocation of cash.

With the capex and depreciation & amortization information gathered, maintenance capex is first separated from growth capex. D&A is assumed to be the minimum maintenance capex required to sustain current activities going forward. Hence, growth capex is calculated as the difference between capex and D&A. The number of transactions with positive growth capex reduce to 74 across all time periods. In other words, there were 74 cases where sponsors actively ploughed back cash in an attempt to achieve above-industry-average growth.

In order to find misallocation of operating cash flow, optimal cash use is compared with growth capex % of revenue. If there exists positive growth capex in a scenario where the optimal use of cash is to paydown debt, then that is categorized as a misuse of cash flow. This is because the hurdle rate test is not met, hence capex investments may not be as value-enhancing as a potential paydown of debt using the same amount of cash. This results in 21 transactions where there was a misallocation of cash:-

Misallocation of Cash (Distribution)		
	# of Deals (Count)	Growth Capex Median (% of Total Capex)
1980 - 1989	5	25.0%
1990 - 1999	10	42.3%
2000 - 2007	5	44.2%
2008 - 2018	1	34.3%
Total	**21**	**40.2%**

In order to find whether the misallocation resulted in a loss of potential upside, actual MOIC is compared with what the MOIC would have been if cash had been used to paydown debt instead. To find the debt paydown scenario MOIC, it is assumed that the same dollar amount of operating cash flow is generated by the company in each holding period year. This is cumulated and subtracted from actual terminal year net debt to find the net debt in debt paydown scenario. Furthermore, since the debt paydown scenario assumes that sponsors do not actively reinvest to grow the business, initial investment year revenue is grown at industry levels and then multiplied with actual terminal year EBITDA margin and exit multiple to find terminal year EV. Net debt is subtracted from this to get terminal year equity, which is then compared with purchase price equity to find the MOIC in the debt paydown scenario.

For all the 21 transactions where there was a misallocation of cash flow, the MOIC that could have been achieved if the Hurdle Rate optimal cash use was followed was higher than the actual MOIC achieved. Hence, this validates the accuracy of the Hurdle Rate test suggested in the hypothesis:-

Misallocation of Cash (MOIC Comparison)		
	Actual MOIC (Median)	**Potential MOIC (Median)**
1980 - 1989	1.3x	1.7x
1990 - 1999	2.6x	3.1x
2000 - 2007	2.3x	2.9x
2008 - 2018	1.3x	3.3x
Total	**2.2x**	**2.9x**

Conclusion

The analysis carried out over a sample set of 204 RLBOs classifies returns into three overarching buckets – operational, multiple, and financial engineering. This shows a clear shift towards operational improvements by sponsors over time. However, unlike previous literature, this paper further breaks down the operational bucket to question whether PE firms have actively generated value or have been riding on a wave of industry growth. Once returns are segregated into sponsor-driven value and non-sponsor related improvements, it becomes evident that PE firms' attempts to actively improve profitability have significantly lagged what the improvements would have been had the portcos operated as is, i.e., without any form of LBO. This result is significant as it shows a different outcome than what previous academic research papers have shown.

It is also surprising that despite investing significant time and money to build operational arms, sponsors, on average, have as good a chance of succeeding at operational improvements as winning a random coin toss. An interesting next step could be to employ the formulation mentioned in this paper for specific PE firms. Such data would help alpha-creating sponsors stand-out from the increasingly commoditized and flooded GP industry, thereby also justifying their fee structure. It could also be used by LPs to determine AUM allocation.

The Hurdle Rate Test is a unique formulation to help determine use of annual operating cash flow. To test whether this hurdle rate is an accurate predictor of optimal cash use, 21 transactions, which differed from the initial suggestion, are analyzed. The hypothetical Equity MOIC calculated had the PE firm followed the Hurdle Rate Test, yielded a higher value than the actual Equity MOIC achieved for all the 21 deals, thus resulting in a 100% success rate of the test.

This test should be carried out over a broader sample size (the paper could not do so due to lack of available information).

As interest rates are expected to edge upwards, sponsors might want to reassess their future strategy. Hurdle Rate to plough back cash is expected to increase, holding other factors constant. This implies that for PE firms that do not have strong operational arms and have historically failed to generate topline alpha, debt repayment is the safest way to unlock equity (100% chance that a dollar in debt repaid leads to a dollar in extra equity versus a much lower chance that a dollar in cash reinvested will lead to incremental equity due to riskiness of internal projects). These sponsors could invest resources in improving capital structure. Such a shift in model would also help sponsors get better covenants and a more flexible debt structure since credit investors would have a higher certainty of repayment (hence lower default risk). Rising interest rates also implies that every dollar of debt repaid would help the company save high future interest expenses, i.e. use of cash would yield a higher return than in previous years. A lower debt proportion also opens-up the option for issuing straight dividends or doing a recapitalization.

Hence, in summary, although operational improvements is the highest value-creating lever in an LBO, given its inherent risks and the changing credit cycle environment, PE firms could rely more heavily on driving value through financial engineering going forward. The optimal mix for operationally underperforming firms would be to focus resources on improving margins and not topline above industry-levels, and to use potential growth capex cash to offload debt instead. Note that by topline growth this paper does not refer to roll-ups or bolt-on acquisitions, which are inorganic methods to grow revenues. It, instead, is critical of the high chance of failure of sponsor attempts to generate topline alpha. It is also important to note that this paper does not advocate all sponsors to shift away from operational improvements. It, instead, provides a tool that sponsors might employ to assess the highest risk-adjusted value-creating driver for LBO transactions.

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