# How Do Private Equity Firms Create Value?*

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**Abstract**

Recent academic research has debated the return performance of private equity (PE) buyout funds relative to public markets. For example, some research suggests that PE fund performance is similar to leveraged public market returns. However, no large sample analysis directly examines the determinants of PE portfolio company performance. In this paper, we fill this gap by providing the first comprehensive study of deal-level performance of buyout investments using a sample of 2,937 fully-exited global deals from 1984 to 2018. We develop a novel approach that controls for industry trends in revenue growth, EBITDA multiples and leverage. We find strong evidence of positive GP-related performance. While much of the contribution is related to higher leverage of private firms, GP-related improvements in operations also add value relative to public-market comparables. We also find that the fraction of value creation attributed to higher leverage of private companies has been declining in recent years. We examine performance drivers by geographic region and industry and find performance creation is generally robust across these sub-groups. Overall, our results suggest that PE firms reliably create value relative to public markets using both operating and financial engineering.

*JEL classification*: G23, G32, G34.

*Keywords*: private equity, leveraged buyouts, value creation.

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# 1. Introduction

Private equity (PE) funds, including venture capital, growth capital, and leveraged buyout funds, make investments in portfolio companies that are not publicly traded on a stock exchange. The PE industry has grown rapidly over the last three decades in part because institutional investors believe that PE strategies have tended to outperform public markets (Begenau, Liang, and Siriwardane (2023)). However, some research has questioned whether PE firms actually create economic value or just provide a more leveraged form of public equity (see Stafford (2021) and Phalippou (2020)). In theory PE firms can potentially generate superior returns in a variety of ways that revolve around careful selection of target firms (i.e., portfolio companies) and then leveraging their large, often controlling, investments to optimize the financial and operating structure of the companies. Yet while a substantial amount of research has evaluated fund-level performance of PE funds, there is little large-sample analyses of portfolio company performance. Thus there exists a very limited understanding of how the activities of PE fund managers (i.e., the general partners, or GPs) actually generate returns to fund investors (i.e., limited partners, or LPs) and if there exist changes that extend beyond higher leverage. Our analysis helps fill the research gap by utilizing a new proprietary dataset of PE buyout deals derived from the investment due diligence process of a major private equity consultant and LP.[1] With key financial information at both the time of the acquisition (entry) and the divestiture of companies (exit) for 2,951 fully-exited deals, we provide systematic analysis of how value is created at the portfolio company level as well as the cross-sectional variation in various value creation strategies. We also benchmark the PE value creation levers against their publicly-traded peers which offers novel insights into the portion of investment return that can be ascribed to the efforts of GPs. This allows us to determine if PE firms are potentially adding value to portfolio companies relative to public-market trends. Moreover, the deals in our sample span the period from 1984 to 2018, which allows us to observe how various value creation mechanisms have evolved over time.

Our specific methodology is derived from the "value-bridge" approach commonly used by practitioners to decompose the *gross* multiple on invested capital (MOIC) of a particular deal. In this context, value creation refers to the appreciation of invested capital in a portfolio company between the deal entry and exit. Naturally, these returns are important to LPs because they represent the underlying investments that power returns at the fund level. They are also important to GPs because the fees accruing to the fund GPs typically include 20% of profits above a set hurdle rate and consequently there is a strong incentives

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[1]We focus our analysis specifically on private equity buyout transactions and we use the terms private equity, LBO, and buyout interchangeably.

for GPs to closely manage their investments to generate high performance multiples. Similar to commonly-used metrics for public market valuation, the value of a private company is typically framed in terms of a ratio comparing price to a financial variable used as a proxy for cash flow generation (e.g., the price-to-earnings ratio). The typical cash flow variable used in the PE industry is EBITDA (Earnings before interest, taxes, depreciation and amortization). Following this framework, the goal of value creation boils down to three objectives: i) improving EBITDA by increasing sales or reducing costs, ii) realizing EBITDA multiple expansion by taking advantage of exit market conditions and/or enhancing the growth prospect of the company, and iii) taking on leverage to increase the interest tax shield and magnify other valuation gains. To achieve these objectives, PE firms actively manage portfolio companies using a large number of strategies that are often categorized as financial engineering, governance engineering and operational engineering (Kaplan and Strömberg (2009)). Our specific value bridge method refines the common industry method to isolate GP contributions in each mechanism by subtracting industry-wide effects. This is achieved by estimating the performance of our metrics using publicly-traded peer companies in the same industry and geographic region. As a result, we can compare the significance of the value creation drivers on a "market-adjusted" basis.

Understanding how value creation is attributed to the skills of GPs is often a part of the due diligence process by prospective investors. As noted already, managers aim to enhance the value of their equity in the target company using a variety of strategies and the amalgamation of these strategies can lead to improved revenue growth, margin enhancements, additional free cash flow, optimized capital structure, and ultimately, higher exit valuations compared to entry valuations. However, some strategies associated with value creation are believed to be more commoditized than others. For example, capital structure today is presumed to provide little competitive edge among private equity managers. Although GPs may choose different levels of leverage on average, the pricing and terms available to GPs are fairly standard given a particular asset and capital structure. On the contrary, a manager's ability to consistently generate incremental value through operational improvements may be considered a differentiator from its peers. Consequently, the ability to identify persistent patterns of value creation can offer valuable insights for LPs when selecting managers and ultimately influence portfolio performance.

Our results indicate that value creation in portfolio companies comes from multiple sources and that this varies across time, industry, and geography. In our full sample, the average MOIC is 2.66.[2] Operational improvement, primarily driven by revenue growth, con-

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[2]Because we are examining deal-level performance and many GP management costs are a at the fund level, it is not possible to precisely examine net performance at the deal level.

tributes 0.75 and thus accounts for about 45% of the total value created. On average, revenue growth contributes 0.62 to the MOIC, with around 40% of this increment attributable to the GPs' ability to generate higher revenue growth than their publicly-traded industry peers. Expansion of the EBITDA valuation multiple from entry to exit contributes an incremental 0.27 to the MOIC. This corresponds to 16% of total value creation, and one-third of the contribution is ascribable to the GPs. Leverage accounts for an incremental 0.79 MOIC (47% of value creation) with the majority (0.51) resulting from GPs utilizing higher leverage than public companies in the same industry. On average, 53% of the total value created can be attributed to the GPs. These results suggest that GPs are substantially increasing the value of their portfolio companies relative to public markets, but that about half of value creation comes from market trends and another quarter is the result of higher leverage. Nonetheless, GP-specific effects appear to generate roughly a 50% improvement in value related to operating performance relative to peer public companies.

Not only do value creation strategies vary across firms, but the significance of value creation drivers also evolves over time. In a competitive landscape where the buyout industry matures, the financial engineering inherent in traditional LBOs has become commonplace (See Sensoy, Wang, and Weisbach (2014), Braun, Jenkinson, and Stoff (2017), Brown, Harris, Jenkinson, Kaplan, and Robinson (2020)). The GP's ability to consistently create value via operational improvements is becoming increasingly crucial. In our sub-period value creation analysis, there was a marked decrease in GP excess leverage from 37% of total value created before 2000 to 28% in the most recent sub-period. Concurrently, the GP's contribution to revenue growth saw an increase from a negative 8% to 26%.

To better understand the variation in value creation strategies, we perform an analysis based on performance groups, geographical regions, industries, and deal size. From the deal characteristics and the value creation drivers' composition by performance groups, we find evidence consistent with GPs' ability to identify undervalued firms and capitalize on their potential growth. Geographically, we find a strong similarity in North America and Europe, with less alignment observed with the rest of the world, especially regarding the leverage strategies. We also discover that the size of a portfolio company strongly influences deal performance and value creation strategies: the MOIC of smaller deals is 3.88×, as opposed to 2.50× for large deals. The revenue growth attributed to GP contribution in smaller deals is six times greater than that in larger deals, whereas GPs of larger portfolio companies place more emphasis on improving profit margins.

Although the understanding of deal-level performance is of great importance, only a few studies exist which scrutinize the source of value creation at portfolio companies, and these have predominantly relied on small, and now dated, samples. Achleitner, Braun, Engel,

Figge, and Tappeiner (2010) and Puche, Braun, and Achleitner (2015) have found that roughly half of the value creation at the deal level can be attributed to EBITDA growth, with another third resulting from leverage. However, these metrics may not provide an accurate depiction of the contributions stemming from the skill of the GP, due to an inherent "market riding" component. For instance, even though EBITDA growth significantly contributes to value creation, a part of this growth could be related to EBITDA growth for all firms within the economy. Gompers, Kaplan, and Mukharlyamov (2016) and Gompers, Kaplan, and Mukharlyamov (2022) conduct studies examining perceived mechanisms of value creation through surveys targeting GPs. They find that GPs regard EBITDA growth as the primary source of value creation, while leverage and multiple expansion are deemed less crucial. Furthermore, within EBITDA growth, GPs attribute greater importance to revenue growth as opposed to cost reduction, a focus that becomes increasingly prominent when comparing the results of Gompers et al. (2022) with those of Gompers et al. (2016). This suggests an increasing emphasis among GPs on growing the business. Such findings are in line with the common perception that PE activities must increasingly contribute to real economic value in order to be a sustainable benefit to investors. However, it's important to note that these conclusions are drawn from GPs self-reporting their own objectives and therefore might be subject to the perception biases (or wishful thinking) of the responding firms.

This paper is organized as follows. Section 2 presents our baseline methodology, Section 3 describes our data, Section 4 discusses the results, and Section 5 concludes.

## 2.  Methodology

Our goal is to understand the sources of value creation in a deal from entry to exit. Conceptually, we decompose the percentage change in equity value during the holding period into five characteristics: revenue growth (represented as $R_{Attr}$), EBITDA margin improvement ($PM_{Attr}$), EBITDA multiple expansion ($Mul_{Attr}$), debt paydown ($DP_{Attr}$), and a leverage effect ($L_{Attr}$) such that

$$\frac{Equity_{ex}}{Equity_{en}} - 1 = R_{Attr} + PM_{Attr} + Mul_{Attr} + DP_{Attr} + L_{Attr}. \tag{1}$$

Here, $Equity_{en}$ and $Equity_{ex}$ represent the equity value of the portfolio company at the time of investment and divestiture, respectively. The exit value includes any interim cash flows out of the company (e.g., a dividend recap) and the entry value includes all investments made into the company. Our method is derived from the value bridge model widely used by practitioners, but as discussed below, we enhance the model to better identify the portion

of each attribute attributable to the skills of GPs.[3]

## 2.1. The leverage effect

In a buyout transaction, the total enterprise value ($TEV$) of the targeted firm is financed through both equity and debt. The debt remains on the portfolio company's balance sheet until it's repaid. This relationship can be represented as

$$TEV_{en} = Equity_{en} + Debt_{en},$$
$$TEV_{ex} = Equity_{ex} + Debt_{ex},$$

where $Debt$ denotes the net debt of the portfolio company. It follows that the holding period return on equity can be written as

$$\frac{Equity_{ex}}{Equity_{en}} - 1 = \frac{TEV_{en} - Debt_{en}}{TEV_{ex} - Debt_{ex}} - 1. \tag{2}$$

The leverage effect functions differently in value creation compared to revenue growth, profit margin improvement, and EBITDA multiple expansion. Improvements in the latter three attributes enhance the company's value (i.e., a larger $TEV$), thus increasing equity value, while leveraging does not directly impact $TEV$. Instead, it amplifies the equity return for a given change in $TEV$. Leverage not only mechanically enlarges the volatility of equity returns, but it also increases the cash flow risk for the portfolio company. It is widely known that an increase in expected return to equityholders could simply be compensation for investors taking on greater risk. Thus, to facilitate comparison among deals, we first isolate the leverage component of returns. In this way the other components of value creation are then calculated and compared on an *unlevered* basis.

We decompose the equity return into three components as follows:

$$\frac{Equity_{ex}}{Equity_{en}} - 1 = \underbrace{\frac{TEV_{ex}}{TEV_{en}} - 1}_{\text{``unlevered'' return}} + \underbrace{\frac{TEV_{ex} - Debt_{en}}{TEV_{en} - Debt_{en}} - \frac{TEV_{ex}}{TEV_{en}}}_{\text{leverage effect } (L_{Attr})} + \underbrace{\frac{Debt_{en} - Debt_{ex}}{Equity_{en}}}_{\text{debt paydown } (DP_{Attr})}. \tag{3}$$

The first component in Equation(3) is the unlevered return, representing the hypothetical return that an investor would receive if there were no debt portion in the total transaction value. The second component is the leverage effect, denoted $L_{Attr}$, defined as the additional return beyond the "unlevered" return due to incurring $Debt_{en}$ at the acquisition time, assuming no debt repayment during the holding period. The third component is the equity

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[3]See Acharya, Gottschalg, Hahn, and Kehoe (2013), Achleitner et al. (2010) and Puche et al. (2015).

value increase associated with debt paydown, denoted $DP_{Attr}$ (which can also be negative if debt is increased during a deal's lifetime).

## 2.2. The unlevered return

The unlevered return, as defined in Equation(3), represents the percentage change in the total enterprise value of the portfolio company over the holding period. Enterprise values are typically referred to as multiples of earnings before interest, taxes, depreciation, and amortization ($EBITDA$), and the total enterprise values ($TEV$) at the purchase and divestiture of the portfolio company are given by

$$TEV_{en} = EBITDA_{en} \times Mul_{en}, \tag{4}$$

$$TEV_{ex} = EBITDA_{ex} \times Mul_{ex}. \tag{5}$$

In this context, $Mul$ signifies the EBITDA multiple, a metric that measures the price of purchasing a dollar of the firm's future cash flow. As can be observed from Equation(4), GPs can sell the portfolio company at a higher price (i.e., a larger $TEV$) either by increasing the EBITDA or by selling at a higher EBITDA multiple than the one at the time of purchase.

We denote the product of EBITDA growth and its multiple growth as

$$Combo_{Mul}^{EBITDA} \equiv \left( \frac{EBITDA_{ex}}{EBITDA_{en}} - 1 \right) \left( \frac{Mul_{ex}}{Mul_{en}} - 1 \right). \tag{6}$$

We then use the following derivation,

$$\frac{TEV_{ex}}{TEV_{en}} - 1 = \frac{EBITDA_{ex} \times Mul_{ex}}{EBITDA_{en} \times Mul_{en}} - 1 \tag{7}$$

$$= \frac{EBITDA_{ex}}{EBITDA_{en}} - 1 + \frac{Mul_{ex}}{Mul_{en}} - 1 + Combo_{Mul}^{EBITDA} \tag{8}$$

$$= \underbrace{\frac{EBITDA_{ex}}{EBITDA_{en}} - 1 + \frac{1}{2} Combo_{Mul}^{EBITDA}}_{EBITDA_{Attr}} + \underbrace{\frac{Mul_{ex}}{Mul_{en}} - 1 + \frac{1}{2} Combo_{Mul}^{EBITDA}}_{Mul_{Attr}}, \tag{9}$$

to attribute the unlevered return to the EBITDA growth component ($EBITDA_{Attr}$) and the EBITDA multiple component ($Mul_{Attr}$), with the combined product term split equally between the two. Splitting the combined product return is an arbitrary assumption and we discuss alternative methods below.

Private equity investors can augment EBITDA by actively assisting firms in growing

their sales and becoming more efficient, for example, by improving profit margins. The relationship between EBITDA, revenue $(R)$, and profit margin $(PM)$ is given by

$$EBITDA = R \times PM. \tag{10}$$

Combining the EBITDA growth component in Equation(7) with Equation(10), we further decompose the EBITDA growth attribute,

$$EBITDA_{Attr} = \left( \frac{R_{ex} \times PM_{ex}}{R_{en} \times PM_{en}} - 1 \right) + \frac{1}{2} Combo_{Mul}^{EBITDA} \tag{11}$$

$$= \frac{R_{ex}}{R_{en}} - 1 + \frac{PM_{ex}}{PM_{en}} - 1 + \underbrace{\left( \frac{R_{ex}}{R_{en}} - 1 \right) \left( \frac{PM_{ex}}{PM_{en}} - 1 \right)}_{Combo_{PM}^{R}} + \frac{1}{2} Combo_{Mul}^{EBITDA} \tag{12}$$

$$= \underbrace{\frac{R_{ex}}{R_{en}} - 1 + \frac{1}{2} Combo_{PM}^{R} + \frac{1}{4} Combo_{Mul}^{EBITDA}}_{\text{Revenue growth } (R_{Attr})} \tag{13}$$

$$+ \underbrace{\frac{PM_{ex}}{PM_{en}} - 1 + \frac{1}{2} Combo_{PM}^{R} + \frac{1}{4} Combo_{Mul}^{EBITDA}}_{\text{Profit margin improvement } (PM_{Attr})}, \tag{14}$$

into value creation drivers that represent revenue growth and the EBITDA margin improvement, respectively $R_{Attr}$ and $PM_{Attr}$.

With Equation7 and 11, the "unlevered" return (i.e., the percentage change in $TEV$ over the holding period) is ascribed to three attributes: revenue growth $(R_{Attr})$, EBITDA margin improvement $(PM_{Attr})$ and EBITDA multiple expansion $(Mul_{Attr})$. Regardless of their share of debt at the time of acquisition, we are able to make meaningful comparisons of three drivers among deals on an unlevered basis. The difference between the holding period equity return and the unlevered return is accounted for by the leverage effect.

To summarize, we break down the holding period equity return of a portfolio company

into five key value creation components,

$$R_{Attr} = \frac{R_{ex}}{R_{en}} - 1 + \frac{1}{2}Combo_{PM}^R + \frac{1}{4}Combo_{Mul}^{EBITDA}$$

$$PM_{Attr} = \frac{PM_{ex}}{PM_{en}} - 1 + \frac{1}{2}Combo_{PM}^R + \frac{1}{4}Combo_{Mul}^{EBITDA}$$

$$Mul_{Attr} = \frac{Mul_{ex}}{Mul_{en}} - 1 + \frac{1}{2}Combo_{Mul}^{EBITDA}$$

$$L_{Attr} = \frac{TEV_{ex} - Debt_{en}}{TEV_{en} - Debt_{en}} - \frac{TEV_{ex}}{TEV_{en}}$$

$$DP_{Attr} = \frac{Debt_{en} - Debt_{ex}}{Equity_{en}},$$

where

$$Combo_{Mul}^{EBITDA} \equiv \left( \frac{EBITDA_{ex}}{EBITDA_{en}} - 1 \right) \left( \frac{Mul_{ex}}{Mul_{en}} - 1 \right),$$

$$Combo_{PM}^R \equiv \left( \frac{R_{ex}}{R_{en}} - 1 \right) \left( \frac{PM_{ex}}{PM_{en}} - 1 \right).$$

## 2.3. GP contribution

In order to distinguish the contribution of GPs in each mechanism from the "market riding" effect, we deduct industry-wide effects from each value creation component. The industry-wide effects of each value creation driver are estimated using corresponding metrics from publicly-traded peer companies in the same industry and geographical region. Specifically, we decompose $R_{Attr}$ into the contributions of the market and GP such that

$$R_{Attr} = R_{Market} + R_{GP},$$

where

$$R_{Market} = \left( \frac{R_{ex}^M}{R_{en}^M} - 1 \right) + \frac{1}{2}Combo_{PM}^{R^M} + \frac{1}{4}Combo_{Mul}^{EBITDA^M}$$

$$Combo_{PM}^{R^M} = \left( \frac{R_{ex}^M}{R_{en}^M} - 1 \right) \left( \frac{PM_{ex}}{PM_{en}} - 1 \right)$$

$$Combo_{Mul}^{EBITDA^M} = \left( \frac{EBITDA_{ex}^M}{EBITDA_{en}^M} - 1 \right) \left( \frac{Mul_{ex}}{Mul_{en}} - 1 \right).$$

For a given deal, $R_{en}^M$ and $R_{ex}^M$ represent the average revenues of public companies within

the same sector at the entry and exit years of the deal. The terms $EBITDA_{en}^M$, $EBITDA_{ex}^M$, $Mul_{en}^M$, and $Mul_{ex}^M$ are calculated in a similar way as follows:

$$PM_{Market} = \left( \frac{PM_{ex}^M}{PM_{en}^M} - 1 \right) + \frac{1}{2} Combo_{PM^M}^R + \frac{1}{4} Combo_{Mul}^{EBITDA^M}$$

$$Mul_{Market} = \left( \frac{Mul_{ex}^M}{Mul_{en}^M} - 1 \right) + \frac{1}{2} Combo_{Mul^M}^{EBITDA}$$

$$Combo_{PM^M}^R = \left( \frac{PM_{ex}^M}{PM_{en}^M} - 1 \right) \left( \frac{R_{ex}}{R_{en}} - 1 \right)$$

$$Combo_{Mul^M}^{EBITDA} = \left( \frac{Mul_{ex}^M}{Mul_{en}^M} - 1 \right) \left( \frac{EBITDA_{ex}}{EBITDA_{en}} - 1 \right).$$

# 3. Data

Our study relies on a novel proprietary dataset of private transactions collected by Step-Stone as part of their investment due diligence process. This dataset includes a diverse set of deal characteristics, including financial data such as net debt, revenue, EBITDA, EBITDA multiple, among others. Values are observed at the time of entry and exit thus enabling our in-depth value creation analysis.

We restrict our analysis to fully-exited buyout transactions. In this context, a fully-exited transaction refers to one where all investments by the private equity (PE) fund have been sold or distributed to partners. We also require that all transactions in our analysis have values for net debt, revenue, EBITDA, and EBITDA multiple at both entry and exit. Our final sample consists of 2,937 fully-exited deals spanning years from 1984 to 2018 with approximately $945 billion USD in combined equity investments and roughly $1.9 trillion USD in total enterprise value (TEV). We estimate these transactions to represent approximately a 43% of the value of all global buyout deals involving PE fund sponsors during this period.[4]

The deals in our sample were sponsored by 624 funds, with the average fund size of $1.7 billion, although fund sizes vary significantly. The average holding period for a deal was about 5.5 years, with an interquartile range of 3 to 7 years. It is common for the funds to acquire a majority (i.e., controlling) ownership stake in the buyout transaction, with the average entry ownership being around 56% and the median at 59%. The figures for entry TEV, net debt, equity, and revenue demonstrate that deal size is highly skewed, with a large number of small to mid-sized transactions and fewer large deals. For instance, the mean

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[4]We calculate this percentage using the Burgiss Manager Universe for all buyout funds with vintage years 1984 to 2017 which is $2,173 billion USD.

entry TEV is $665 million, which exceeds the 75th percentile of $501 million. Such features are consistent with the known composition of PE buyout transactions. The mean entry EBITDA multiple is 8.25×, with an interquartile range of 5.93× to 9.48×. Over the life of the deal, the average EBITDA multiple increases by 1.77×, with an interquartile range from −0.06× to 3.71×, and the average deal MOIC is 3.67×, with an interquartile range from 1.68× to 4.65×.

**[Insert Table 1 near here]**

We report the median values of some important variables for our sample and its subgroups in Table 1. The variables include the performance metrics, the deal attributes and pricing, and the financial condition of the portfolio companies at the acquisition date. Panel A of Table 1 shows that our sample deals have higher performance than the average buyout deal in the Burgiss data. According to the Burgiss quartile cutoffs, about 55% of our deals are in the top quartile, about 22% are in the second quartile, and 23% are in the bottom half. The weighted-average MOIC of the 2,937 portfolio companies in our sample is 2.65. We also calculate the unweighted mean and median of MOIC, which are 3.66 and 2.97, respectively (not reported in the table). Our sample has above-average performance for two reasons. First, we only select deals that are fully realized, which tends to exclude recent deals that are less successful (and have longer deal durations). Second, the StepStone data include deals that are better than average because they come from due diligence of previous funds, which creates a positive selection bias. In addition, the multiples in the table are based on the deal characteristics, not the GP's experience. If we use the cash flows that the GPs actually invested and received (MOIC Invested), the overall MOIC decreases by about −0.33 to 2.32 and the differences across quartiles become smaller. Differences can arise because of how deals are structured and managers are compensated resulting in a typical deal experiencing valuation "leakage" for the GP and LPs. The gross PMEs of our sample deals are also higher than the average deal in the Burgiss data. The mean PME is 1.85, with top quartile deals reaching 2.99. The bottom half of deals have average PMEs close to one (0.95), meaning that their gross returns are similar to market returns.

We report the location, industry, size, and entry vintage of the portfolio companies in our sample in Table 1, Panels B to E. In Panel B, we see that more than half of the portfolio companies are in North America (U.S. or Canada). The rest are mostly in Europe, including the U.K. and continental Europe. A small number of portfolio companies are in Asia, mainly from Singapore and Japan. The portfolio companies in Europe or Other regions are significantly smaller than those in North America. In Panel C, we classify the deals into nine industry sectors using GICS code. The majority of deals are in four sectors: industrials,

consumer discretionary, information technology and health care, which together account for around 70% of all the deals in our sample. Health care and information technology are the two most expensive sectors in terms of the EBITDA multiple paid by the GPs at acquisition, but they also achieve the highest multiple expansion from entry to exit.

We categorize the deals by the transaction size (in terms of TEV) in Panel D. Small deals are those with TEV less than $100 million USD, mid-size deals are those with TEV between $100 million and $500 million USD, and large deals are those with TEV more than $500 million USD. The small and medium size deals perform significantly better than the large deals in our sample. We also observe that the EBITDA multiple of the portfolio company is positively correlated with size. In Panel E, we group the deals by entry vintage. In our sample, most of the acquisitions take place after 2000 and the deals with entry time between 2000 and 2007 outperform the other two periods under all three performance metrics.

In addition to Stepstone's deal-level data on private equity transactions, we utilize the Compustat data on financial statements of publicly traded companies to derive benchmarks by industry for revenue growth, profit margin improvement and EBITDA multiple expansion over the holding period of the portfolio company. The leverage effect is benchmarked at the overall industry leverage at the time of entry. The benchmarks of revenue growth and profit margin improvement represent the development of the industry over the holding period. EBITDA multiple benchmarks reveal the movements of key market factors, e.g., risk free rate, risk appetites, credit conditions, etc., influence the pricing of transactions. The benchmark leverage ratios show the leverage usage by sectors in each year and enable us to infer the extent that managers utilize financial leverage differently than what is observed in public companies in the same industry.

# 4.   Deal Value Creation Attribution Results

We apply the value bridge methodology described above to the transactions in our sample. For each transaction, we create estimates of the value creation components discussed in Section 2 and in Appendix B. We create aggregate statistics of each value creation component using a weighted-average based on equity values at entry. We then calculate percentage contributions to overall value creation to mitigate concerns about the positive performance bias in the sample. We choose entry equity for our weighted averages because it is economically relevant and less affected by skewness than other measures. We also examine the differences in value creation between regions, industries, and sub-periods.

## 4.1. Full sample

We present the value creation attribution for the full sample in Figure 1 and Table 2. In Figure 1, the boxes show the average contribution (in percentage terms) of each value creation driver for the full sample. Table 2 reports the average contribution of each value creation driver in absolute terms and how each driver is split between GP contribution and market effect. We observe an average MOIC of 2.66×, while the unlevered return accounts for 61% of total value created (unlevered MOIC is 2.02×).[5] Value creation from leverage is 47% (0.79× incremental MOIC) with most of this (0.51×) due to GPs taking higher leverage at their portfolio company than the public peers in the same industry. The contribution from debt paydown is negative (−0.15×) in our sample which means that on average GPs are increasing the level of debt while owning the company.

**[Insert Figure 1 near here]**

**[Insert Table 2 near here]**

The operational improvement component, specifically the EBITDA growth component, is the sum of the revenue growth component (0.62) and the EBITDA margin component (0.13), which accounts for approximately 45% of the total value created. On average, the revenue growth component contributes an incremental MOIC of 0.62, with around 40% of this increment attributable to the GPs' skill in achieving higher revenue growth compared to their publicly-traded peers in the same industry. The EBITDA margin expansion component contributes 8% to the total value created and is evenly split between the market effect and GP contribution. These findings align with previous studies that highlight the significance of operational improvement in generating nearly half of the total value created by GPs.[6]

EBITDA multiple expansion occurs when a company is sold at a higher price per dollar of cash flow compared to the time of acquisition. It can reflect the GPs' ability to acquire at a lower cost due to a proprietary advantage in deal sourcing or their capacity to enhance the long-term outlook of the company and thus command a higher valuation upon exit. There has also been an average tailwind on multiples related to larger firms commanding higher multiples on average (as seen in Table 1). In our sample, EBITDA multiple expansion contributes 0.27× (16%) to the MOIC, with 0.19× (12%) resulting from industry-wide expansion and 0.08× (7%) attributed to the GP's ability to buy at a lower cost or sell at a higher price.

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[5]By our definition, MOIC equals total value creation plus one

[6]See Achleitner et al. (2010) and Puche et al. (2015).

## 4.2. Value Creation by Performance Group

We also conduct the attribution analysis by performance groups based on the Burgiss breakpoints discussed in Section 3. Our findings reveal significant variations in contributions across these groups. Figure 2 displays the absolute contributions (incremental MOIC) of each value creation driver, while Table 3 presents the breakdown of each driver between GP contribution and market effect. In the top quartile group, all return drivers (except deleveraging) demonstrate meaningful contributions. Notably, the leverage effect accounts for a larger percentage of the equity return (53%) compared to the full sample (47%), indicating that a portion of the higher return results from taking on greater financial risk. This observation is further supported by Panel A of Table 1, which highlights that top-quartile deals are smaller in size but possess higher leverage ratios.

Another intriguing finding from Table 1 is that portfolio companies in the top-quartile were acquired at lower EBITDA multiples and sold at higher EBITDA multiples. This is reflected in the much higher GP contribution of EBITDA multiple (50%) compared to the full sample (28%). Additionally, significant outperformance is observed in both revenue growth and EBITDA margin expansion, as evident from Table 3. These results underscore the GP's ability to identify undervalued firms and capitalize on their growth potential.

**[Insert Figure 2 near here]**

**[Insert Table 3 near here]**

In contrast, below-median deals (quartiles 3 and 4) exhibit average losses, primarily driven by a decline in profit margins. Additionally, the losses are magnified by leverage. Although revenue growth makes a positive contribution, the GPs underperform the market by a considerable margin. Similarly, EBITDA multiple also are low compared to the market. Table 1 reveals that these portfolio companies are not acquired at a higher price, particularly when compared to quartile 2 firms. Instead, these companies are sold at significantly lower prices relative to the other two groups, likely due to their poor revenue and profitability growth. We note that the combined market effects for quartile 3 and 4 firms are also small compared to market effects for quartiles 1 and 2 which suggests that there is likely a strong market-wide headwind for these deals.

## 4.3. Value creation by geographic regions

To examine the disparity in value creation across different geographical regions, we divid our sample into three regions: North America, Europe, and Others (primarily Asia but also

including Africa, Latin America, and the Middle East). Among our sample deals, there are 1,624 located in North America, 1,039 in Europe, and 234 in other countries. The outcomes of the analysis by geographic region are presented in Table 4 and Figure 3.

[**Insert Figure 3 near here**]

[**Insert Table 4 near here**]

North America exhibits the highest MOIC of 2.78, followed by Europe at 2.45, while deals in other countries have the lowest performance at 2.23. However, the unlevered MOIC presents a different perspective, with deals in Europe performing worse at 1.74 compared to other regions at 1.96. This difference is primarily due to the very low leverage of deals in other countries, as evidenced by the negative contribution of the leverage effect resulting from many deals having negative net debt at entry (i.e., more cash on the balance sheet than debt). This can also be observed in Table 1. Additionally, GPs of portfolio companies in other regions tend to borrow significantly less debt than their publicly traded peers in the same industry. Furthermore, deals in other countries often involve debt paydown during the course of the deal, instead of taking on more leverage. In contrast, GPs of portfolio companies in North America frequently borrow more.

There is substantial variation in operating improvements, ranging from 0.45 to 0.85×. Revenue growth emerges as a significant value creation driver in all regions, while EBITDA margin expansion is only observed (on average) in North America and Europe. EBITDA multiple expansion serves as a value driver in all regions. In other regions, the GP contribution to EBITDA multiple expansion accounts for over 50% of value changes, whereas in North America and Europe, EBITDA multiple expansion is primarily driven by the market effect. Overall, we find strong similarities between North America and Europe, while the alignment of value creation contributions with the rest of the world is weaker. Finally we note that despite the lower gross MOIC expansion the PMEs of deals across regions are quite similar (around 1.7-1.8) suggesting that even the lower multiples in Europe and other countries were in line with broader market trends.

## 4.4. Value creation over time

To investigate whether the value creation drivers have changed over time, we divide our sample into three sub-periods based on the year of deal entry. The first period spans from the beginning of our sample through 1999, including 272 deals. The second period covers the years 2000 to 2007, leading up to the Global Financial Crisis (GFC), with 1,500 deals

falling into this group. The third period spans from 2008 through 2019 and encompasses 1,179 deals.

**[Insert Figure 4 near here]**

**[Insert Table 5 near here]**

The results of the sub-period attribution analysis are presented in Figure 4 and Table 5. The "Total Value Creation" column in Table 5 indicates that the average MOIC shows a slight downward trend over the three sub-periods. However, the trends of individual value creation components are more interesting. For example, Figure 4 highlights a substantial decrease in the leverage component over time, primarily driven by a decline in GP excess leverage from 37% in the pre-2000 sub-period to 28% in the most recent sub-period. Within the EBITDA component, the contribution from revenue growth remains the largest and remains relatively stable in the mid-3% range. However, the composition of GP contribution and market effect has varied significantly, with GP contribution increasing from $-8\%$ to 26%.

Contributions from both market and GP EBITDA multiple expansion exhibit variation across the sub-periods, with market multiple expansion shifting from being a modest headwind to a substantial tailwind over time. EBITDA margin expansion consistently makes a positive contribution, but its importance has increased in the most recent sub-period.

The contributions from leverage also reveal interesting patterns. Market leverage has remained a steadily increasing contributor, ranging from 10% to 18%, while the GP excess leverage contribution has declined from 37% in the pre-2000 sub-period to 28% in the most recent sub-period. There are also notable trends in deleveraging, with deals on average paying down debt prior to 2000 and increasing debt in the post-GFC period.

While the sub-period analysis highlights broad secular trends, it masks the well-known cyclical variation in buyout deal characteristics. To examine cyclical variation, we conduct attribution analysis by entry year (results not tabulated). We observed low MOICs for deals entered just before the burst of the dotcom bubble in 1999 and the GFC in 2008, primarily driven by low contributions from leverage. Low values from 2016 and later periods were driven largely by a selection bias towards deals with quick exits. The highest MOICs were observed for deals entered in 1995 and earlier, with leverage being the largest contributor to performance. In contrast, the strong performance for 2014 vintage deals was primarily driven by robust EBITDA growth. Overall, there is a downward trend in the leverage component over time, which aligns with the sub-period results.

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## 4.5. Value creation by industry

We conduct an analysis of value creation across nine industries and present the results in Table 6. Figure 5 shows the analysis for the four most-represented industries in our sample: consumer discretionary, healthcare, industrials, and information technology. We find significant differences in value creation across these industries. The MOICs range from 2.03× for the communication industry to 3.15× for the healthcare industry.

[**Insert Figure 5 near here**]

[**Insert Table 6 near here**]

Despite these differences in overall value creation, the contributions of individual components remain fairly stable across most industries. Revenue growth and GP excess leverage consistently emerge as significant contributors to performance. It is worth noting that the contribution of GP excess leverage is negative for the financial industry, likely due to the inclusion of highly-leveraged regulated financial firms, such as banks, which are rarely targeted in buyout transactions.

Similarly, the EBITDA multiple expansion components are consistent contributors across almost all industries, although their magnitudes are relatively modest. These findings indicate the presence of different value creation strategies across industries. For instance, the information technology industry ranks in the middle in terms of overall performance, yet it exhibits the second-highest EBITDA component. Additionally, the healthcare industry ranks seventh in terms of MOIC, primarily due to its lower leverage.

The deleveraging contribution is negative for most industries in our sample, indicating that debt expansion during a deal's lifespan is a common occurrence across industries.

## 4.6. Value creation by deal size

Our analysis reveals that the size of a portfolio company is a significant factor associated with deal performance and value creation strategies. Specifically, the MOIC of small deals is 3.88×, which is substantially higher compared to 2.50× for large deals.

[**Insert Figure 6 near here**]

[**Insert Table 7 near here**]

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Furthermore, the revenue growth ascribed to GP contribution in small deals is six times higher than that in large deals. This suggests that GPs of small portfolio companies are more successful in driving revenue growth compared to their counterparts in larger companies. On the other hand, GPs of large portfolio companies tend to focus more on improving profit margins as a value creation strategy.

These findings highlight the importance of considering the size of a portfolio company when assessing deal performance and formulating value creation strategies. The dynamics and characteristics of small and large companies may necessitate different approaches to maximize returns and achieve successful outcomes.

# 5. Conclusion and Future Work

In this study, we have utilized a new proprietary dataset comprising 2,951 fully-exited deals to conduct a comprehensive analysis of value creation at the portfolio company level. Our analysis reveals several key findings regarding the drivers and dynamics of value creation in private equity.

On average, the multiple on invested capital (MOIC) in our sample is 2.66, indicating that private equity investments generate significant value. Operational improvements, primarily driven by revenue growth, account for 45% of the total value created. Revenue growth contributes an incremental MOIC of 0.62×, with around 40% of it attributed to GP-specific effects in achieving higher revenue growth compared to publicly traded peers in the same industry.

EBITDA multiple expansion contributes 16% of the total value creation, with one-third of the contribution attributable to GPs. Leverage plays a significant role, contributing 47% of the incremental MOIC, with the majority (0.51×) resulting from GPs employing higher leverage compared to public companies in the same industry. Overall, 53% of the total value created can be attributed to the GPs.

We further analyze value creation by performance groups, geographic regions, industries, and deal size. Our findings highlight the importance of GPs' abilities in identifying undervalued firms and capitalizing on their growth potential for generating high returns. We observe a strong similarity in value creation contributions between North America and Europe, while other regions show weaker alignment, particularly in leverage strategies. Additionally, the size of a portfolio company is a significant factor associated with deal performance and value creation strategies, with small deals exhibiting higher MOIC and greater emphasis on revenue growth, while GPs of large portfolio companies focus more on improving profit margins.

By conducting sub-period analysis, we observe a substantial decrease in GP excess lever-

age over time, along with an increase in GP contribution to revenue growth. These trends suggest evolving value creation strategies and a shift towards a greater focus on operational improvements.

While our study provides valuable insights into value creation in private equity, there are further avenues for research, such as exploring the persistence, cyclical patterns, and industry-specific aspects of value creation styles among individual GPs. Overall, our analysis enhances the understanding of value creation mechanisms in private equity and provides a foundation for future investigations in this field.

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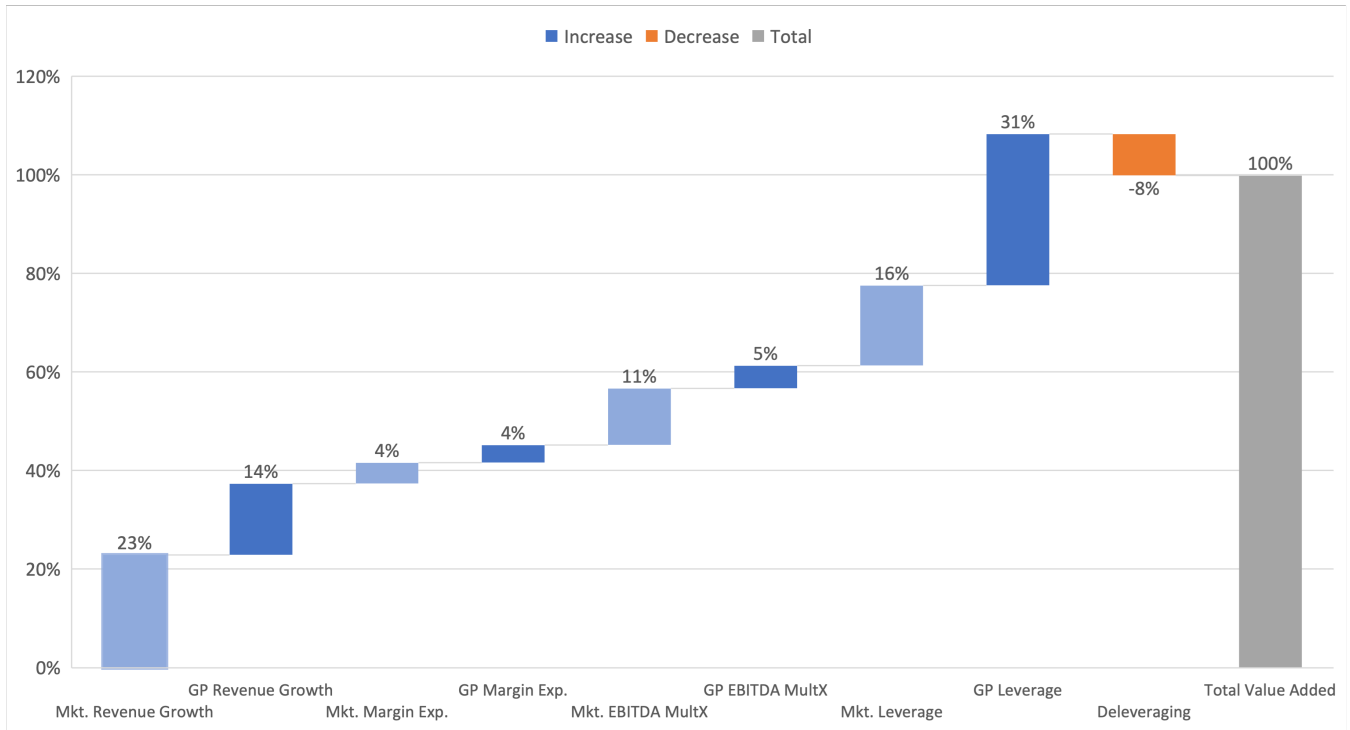
Fig. 1. Value Creation Analysis of Full Sample.
This figure shows the value creation attribution of the full sample in percentage terms. The blue and orange boxes represent the average contribution of each value creation driver we defined in Section 2, including Revenue Growth, EBITDA Margin improvement (labeled as Margin Exp.), EBITDA Multiple expansion (labeled as EBITDA MultX), Leverage Effect (labeled as Leverage), Debt Paydown (labeled as Deleveraging). The prefix of Mkt. and GP refers to market effect and GP contribution respectively.

Fig. 2. Value Creation Analysis by Performance group.
This figure shows the value creation attribution by performance group in absolute terms (incremental MOIC).
The sample is devided into groups based on the Burgiss breakpoints discussed in Section 3. The clusters
of bars represent the average contribution of each value creation driver we defined in Section 2, including
Revenue Growth, EBITDA Margin improvement (labeled as Margin Exp.), EBITDA Multiple expansion
(labeled as EBITDA MultX), Leverage Effect (labeled as Leverage), Debt Paydown (labeled as Deleveraging).

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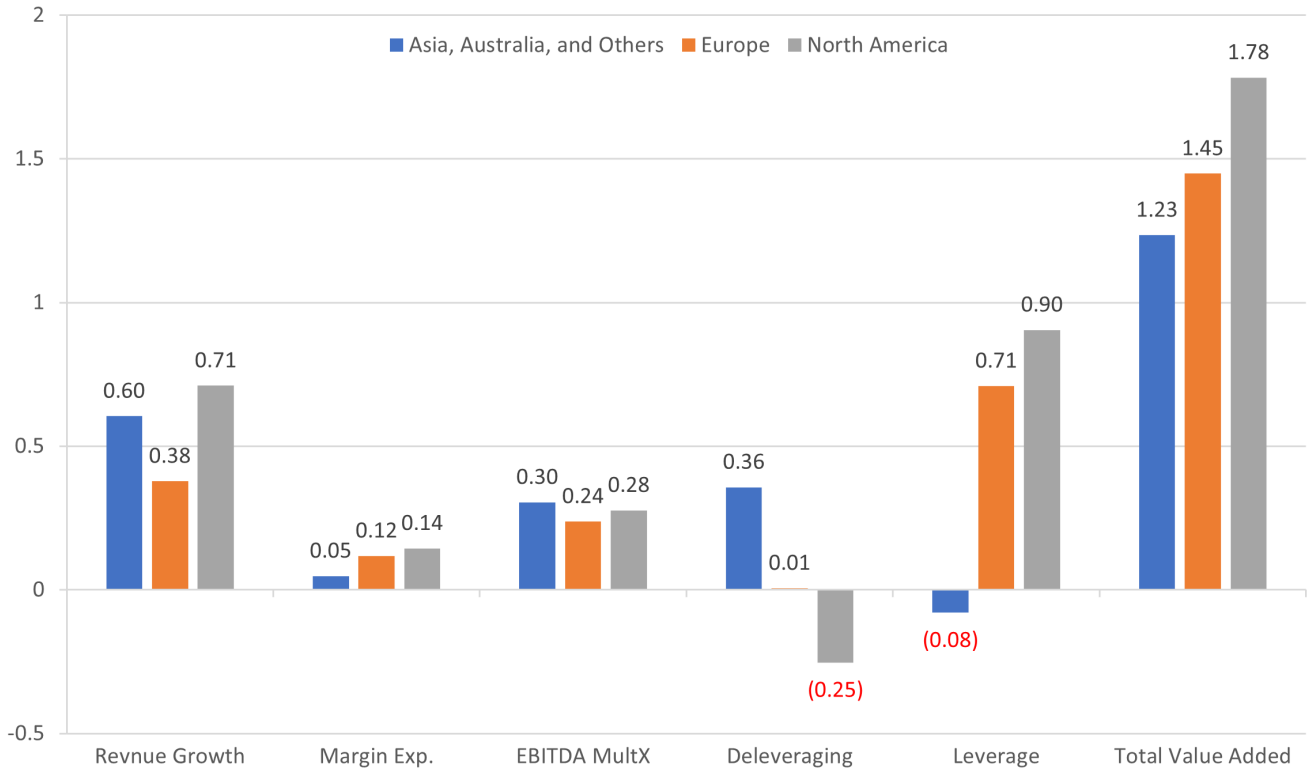
Fig. 3. Value Creation Analysis by Geographic Region.
This figure shows the value creation attribution by geographic region in absolute terms (incremental MOIC). The sample is devided into groups based on the Burgiss breakpoints discussed in Section 3. The clusters of bars represent the average contribution of each value creation driver we defined in Section 2, including Revenue Growth, EBITDA Margin improvement (labeled as Margin Exp.), EBITDA Multiple expansion (labeled as EBITDA MultX), Leverage Effect (labeled as Leverage), Debt Paydown (labeled as Deleveraging).
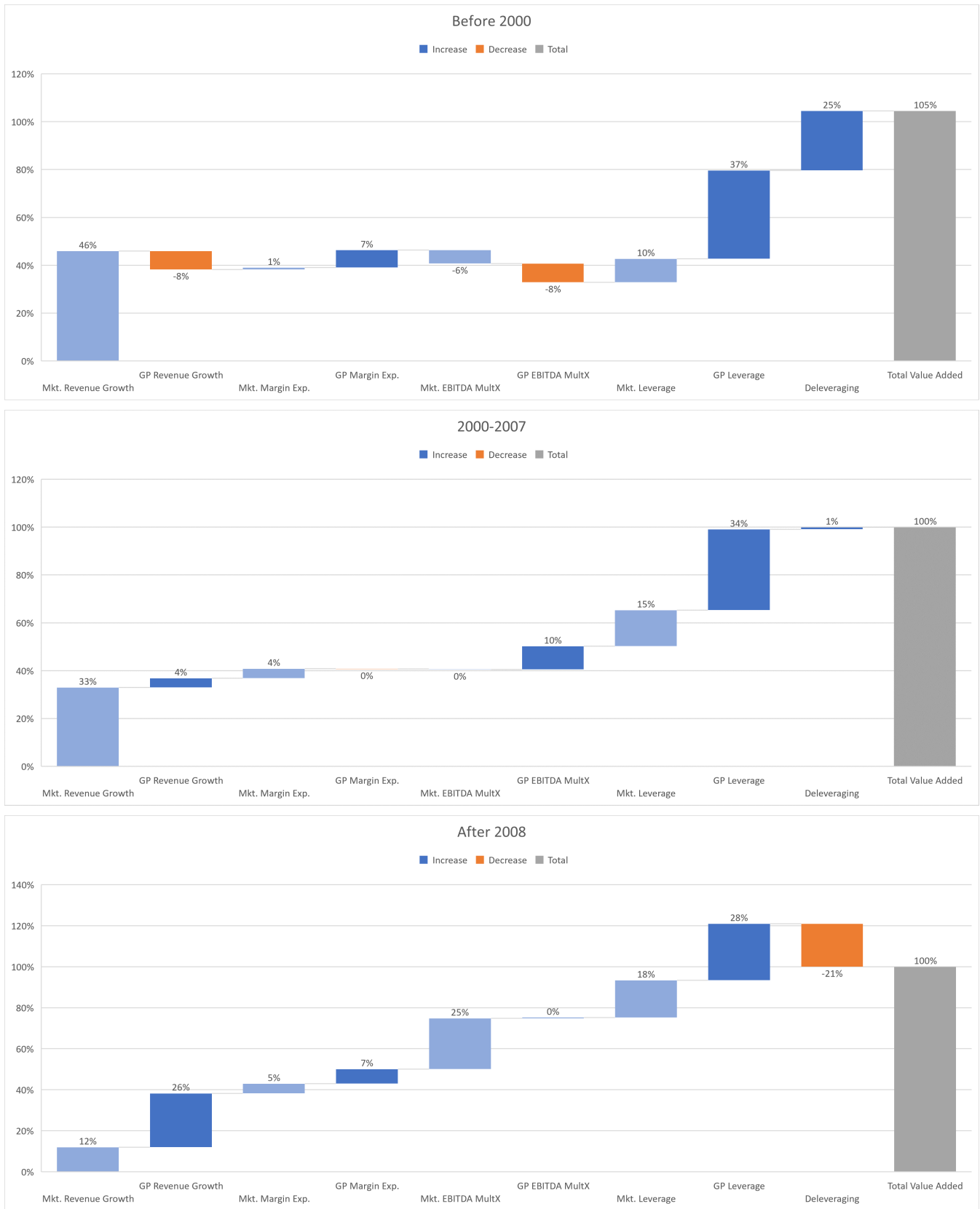
Fig. 4. Value Creation Analysis by Sub-period.

These figures show the value creation attribution by sub-period in percentage terms. The sample is devided into three groups based on the time of acquisition. The blue and orange boxes represent the average contribution of each value creation driver we defined in Section 2, including Revenue Growth, EBITDA Margin improvement (labeled as Margin Exp.), EBITDA Multiple expansion (labeled as EBITDA MultX), Leverage Effect (labeled as Leverage), Debt Paydown (labeled as Deleveraging). The prefix of Mkt. and GP refers to market effect and GP contribution respectively.
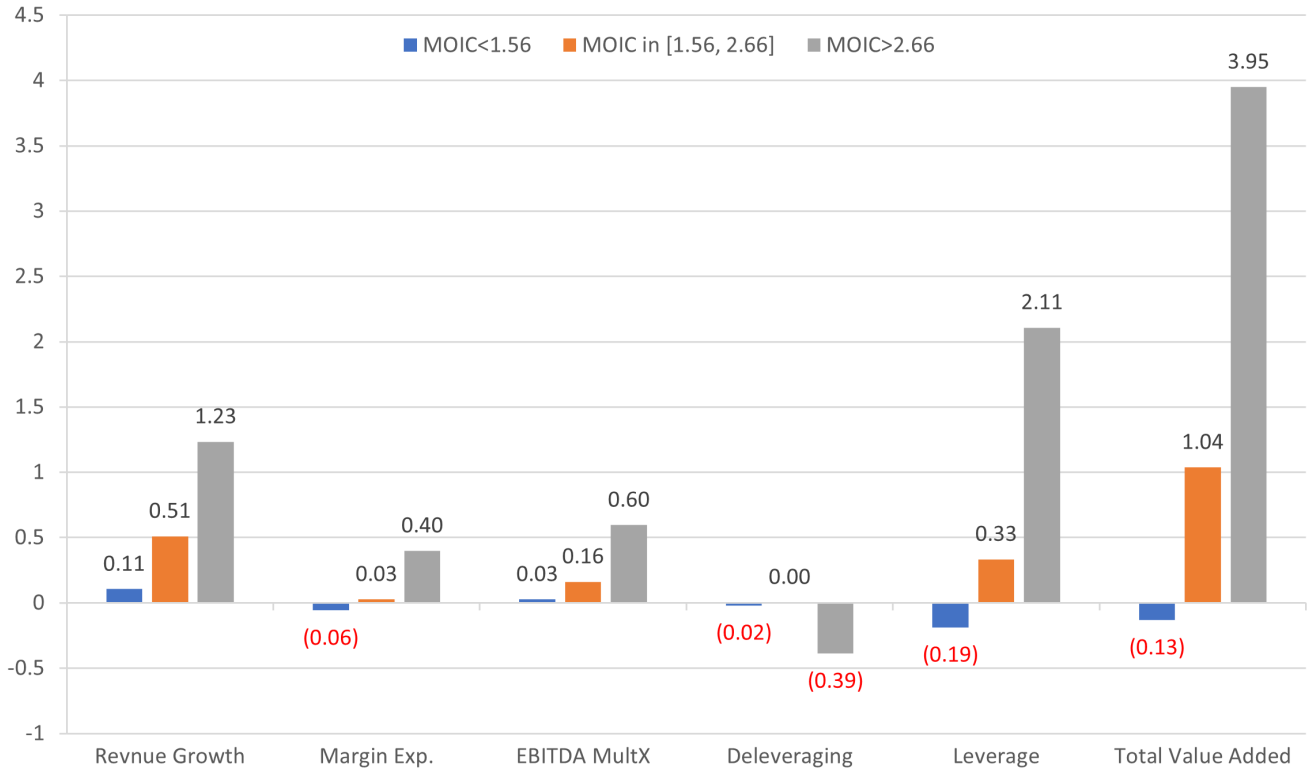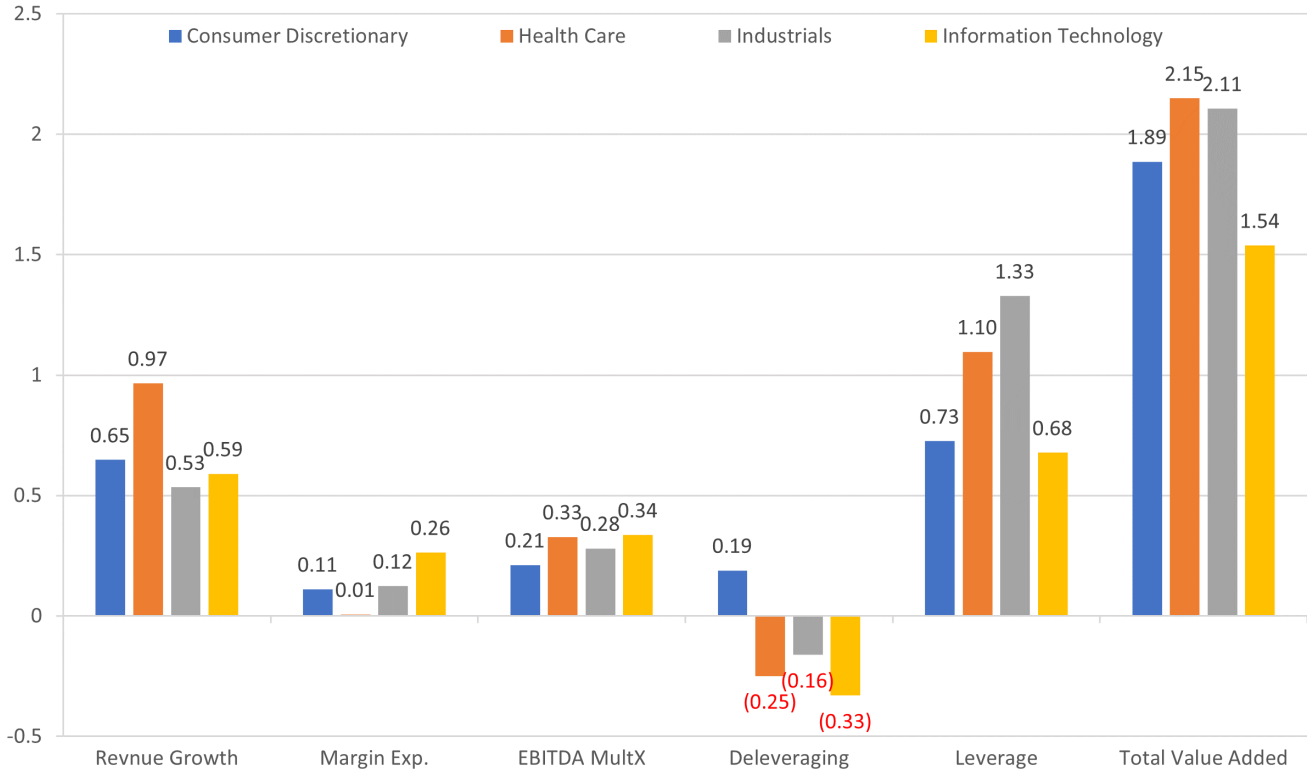
Fig. 5. Value Creation Analysis by Industry.
This figure shows the value creation attribution by industry sectors in absolute terms (incremental MOIC). The sample is devided into groups based on the GSIC cod. The clusters of bars represent the average contribution of each value creation driver we defined in Section 2, including Revenue Growth, EBITDA Margin improvement (labeled as Margin Exp.), EBITDA Multiple expansion (labeled as EBITDA MultX), Leverage Effect (labeled as Leverage), Debt Paydown (labeled as Deleveraging).

Fig. 6. Value Creation Analysis by size group.
This figure shows the value creation attribution by size group in absolute terms (incremental MOIC). The sample is devided into size groups as discussed in Section 3. The clusters of bars represent the average contribution of each value creation driver we defined in Section 2, including Revenue Growth, EBITDA Margin improvement (labeled as Margin Exp.), EBITDA Multiple expansion (labeled as EBITDA MultX), Leverage Effect (labeled as Leverage), Debt Paydown (labeled as Deleveraging).

| | Obs. | PME | IRR | MOIC | Entry Year | Holding Period | TEV Entry | Net Debt | OWN Entry | REV Entry | EBITDA Entry | EMUL Entry | EMUL Exit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Medium | | | | | | | |
| **Final Sample** | 2937 | 1.89 | 0.28 | 2.97 | 2006 | 5 | 162 | 65 | 0.59 | 121 | 21.0 | 7.41 | 9.24 |
| | | | | | | | | | | | | | |
| **Panel A: MOIC Quartile (Burgiss Breakpoints)** | | | | | | | | | | | | | |
| Quartile 1 [> 2.66] | 1619 | 2.65 | 0.42 | 4.44 | 2006 | 5 | 141 | 67 | 0.63 | 118 | 19.4 | 7.13 | 9.80 |
| Quartile 2 [1.56, 2.66] | 653 | 1.50 | 0.21 | 2.11 | 2007 | 5 | 208 | 71 | 0.52 | 140 | 28.0 | 7.92 | 9.30 |
| Quartile 3 [< 1.56] | 665 | 0.63 | 0.00 | 0.76 | 2007 | 6 | 176 | 55 | 0.52 | 116 | 21.5 | 7.63 | 7.70 |
| **Panel B: Region** | | | | | | | | | | | | | |
| North America | 1621 | 2.01 | 0.29 | 3.10 | 2007 | 5 | 197 | 81 | 0.59 | 129 | 24.7 | 7.63 | 9.58 |
| Europe | 1082 | 1.81 | 0.26 | 2.85 | 2006 | 5 | 129 | 57 | 0.60 | 117 | 17.8 | 7.23 | 8.81 |
| Other | 234 | 1.64 | 0.26 | 2.20 | 2007 | 5 | 106 | 16 | 0.46 | 106 | 17.9 | 6.99 | 8.93 |
| **Panel C: Industry** | | | | | | | | | | | | | |
| Communication | 255 | 1.70 | 0.26 | 2.27 | 2006 | 5 | 387 | 133 | 0.41 | 159 | 41.8 | 8.26 | 9.03 |
| Consumer Discretionary | 581 | 1.89 | 0.27 | 2.81 | 2006 | 5 | 155 | 70 | 0.57 | 141 | 21.0 | 7.34 | 8.74 |
| Consumer Staples | 215 | 1.74 | 0.28 | 2.92 | 2006 | 5 | 154 | 64 | 0.57 | 165 | 20.0 | 7.10 | 8.61 |
| Financials | 146 | 1.94 | 0.26 | 2.64 | 2007 | 5 | 286 | 53 | 0.45 | 107 | 32.0 | 8.40 | 10.56 |
| Health Care | 367 | 1.92 | 0.28 | 3.11 | 2007 | 5 | 174 | 58 | 0.59 | 94 | 18.8 | 8.43 | 11.40 |
| Industrials | 624 | 1.91 | 0.27 | 3.09 | 2006 | 5 | 121 | 59 | 0.66 | 120 | 18.5 | 6.77 | 8.44 |
| Information Technology | 421 | 2.02 | 0.29 | 3.00 | 2007 | 5 | 177 | 50 | 0.60 | 86 | 19.9 | 8.61 | 11.04 |
| Materials | 220 | 2.02 | 0.31 | 3.28 | 2006 | 5 | 169 | 91 | 0.66 | 166 | 27.1 | 6.28 | 7.95 |
| Other | 108 | 1.71 | 0.27 | 3.10 | 2006 | 5 | 151 | 63 | 0.56 | 93 | 19.7 | 6.45 | 8.75 |
| **Panel D: Size** | | | | | | | | | | | | | |
| Small | 1091 | 2.03 | 0.30 | 3.27 | 2006 | 5 | 46 | 18 | 0.65 | 44 | 7.1 | 6.38 | 8.41 |
| Medium | 1111 | 1.93 | 0.29 | 3.01 | 2007 | 5 | 204 | 98 | 0.60 | 141 | 26.7 | 7.69 | 9.52 |
| Large | 735 | 1.66 | 0.24 | 2.47 | 2007 | 6 | 1060 | 579 | 0.42 | 710 | 130.4 | 8.89 | 9.98 |
| **Panel E: Entry Time** | | | | | | | | | | | | | |
| Before 2000 | 276 | 2.09 | 0.25 | 3.07 | 1997 | 6 | 91 | 49 | 0.50 | 120 | 14.0 | 6.84 | 7.58 |
| 2000-2007 | 1491 | 2.21 | 0.26 | 3.09 | 2005 | 6 | 171 | 76 | 0.58 | 127 | 22.5 | 7.23 | 8.63 |
| After 2008 | 1170 | 1.61 | 0.30 | 2.72 | 2011 | 4 | 185 | 57 | 0.62 | 116 | 22.2 | 7.88 | 10.60 |

**Table 1: Summary Statistics**

This table shows the mediums of different variables for our sample including performance metrics (PME, IRR and MOIC), deal characteristics (Entry Year, Holding Period, Ownership Percentage [column: OWN Entry] and Deal Size measured by total enterprise value at entry in units of USD millions [column: TEV Entry]), selected financial variables at acquisition in units of USD millions (Net Debt, Revenue [column: REV Entry], EBITDA [column: EBITDA Entry]) and valuation metrics (EBITDA Multiple at entry [column: EMUL Entry] and at exit [column:EMUL Entry]. We also examine the data by MOIC quartiles (Panel A), regions (Panel B), industries (Panel C), size of the deal (Panel D), and time of acquisition (Panel E).

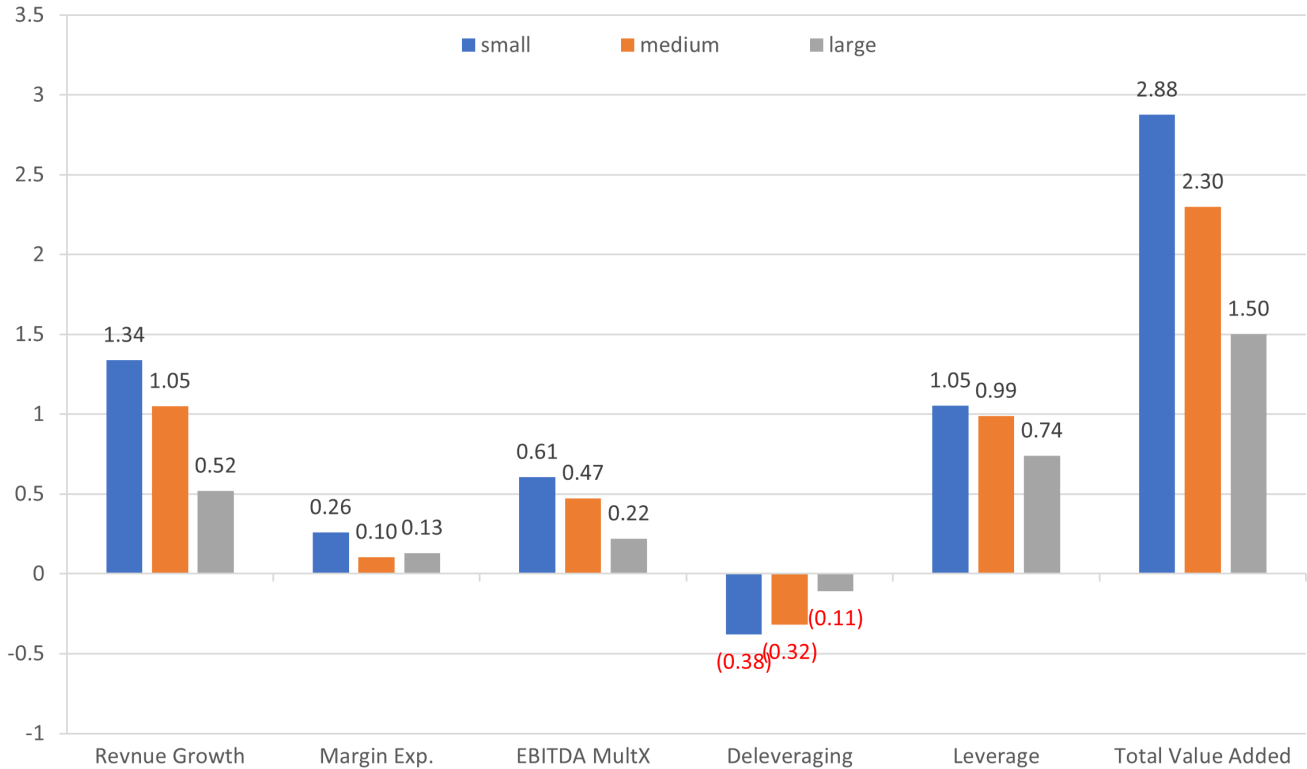| | Revenue Growth | EBITDA Margin Expansion | EBITDA Multiple Expansion | Leverage | Debt Paydown | Total Value Creation | PME |
|---|---|---|---|---|---|---|---|
| **MOIC Contributions** | | | | | | | |
| Full Sample | 0.62 | 0.13 | 0.27 | 0.79 | −0.15 | 1.66 | 1.76 |
| | | | | | | | |
| **GP Contribution** | 0.24 | 0.06 | 0.08 | 0.51 | | 0.89 | |
| Percentage | 38% | 46% | 28% | 65% | | 53% | |
| | | | | | | | |
| **Market Effect** | 0.38 | 0.07 | 0.19 | 0.27 | | 0.92 | |
| Percentage | 62% | 54% | 72% | 35% | | 56% | |

**Table 2: Value Creation Analysis for Full Sample**

This table shows the value creation attribution of the full sample in absolute terms (incremental MOIC). Column Total Value Creation is the holding period equity return, which equals to MOIC minus one by definition in Section 2. The two rows of percentage represent the percentage of the contribution of a attribute that should be ascribed to GP Contribution (or Market Effect).

|  | Revenue Growth | EBITDA Margin Expansion | EBITDA Multiple Expansion | Leverage | Debt Paydown | Total Value Creation | PME |
|---|---|---|---|---|---|---|---|
| **MOIC Contributions** | | | | | | | |
| Full Sample | 0.62 | 0.13 | 0.27 | 0.79 | −0.15 | 1.66 | 1.76 |
| | | | | | | | |
| **Quartile 1** [> 2.66] | 1.24 | 0.40 | 0.59 | 2.11 | −0.39 | 3.95 | 2.70 |
| GP Contribution | 0.70 | 0.28 | 0.29 | 1.49 | | 2.76 | |
| Market Effect | 0.54 | 0.12 | 0.30 | 0.62 | | 1.58 | |
| | | | | | | | |
| **Quartile 2** [1.56 to 2.66] | 0.51 | 0.03 | 0.17 | 0.34 | 0.00 | 1.04 | 1.60 |
| GP Contribution | 0.13 | −0.04 | −0.04 | 0.14 | | 0.18 | |
| Market Effect | 0.38 | 0.07 | 0.21 | 0.20 | | 0.86 | |
| | | | | | | | |
| **Quartile 3&4** [< 1.56] | 0.11 | −0.06 | 0.03 | −0.18 | −0.02 | −0.13 | 0.95 |
| GP Contribution | −0.13 | −0.08 | −0.05 | −0.17 | | −0.44 | |
| Market Effect | 0.24 | 0.02 | 0.08 | −0.01 | | 0.33 | |

Table 3: Value Creation Analysis by Performance Group

|  | Revenue Growth | EBITDA Margin Expansion | EBITDA Multiple Expansion | Leverage | Debt Paydown | Total Value Creation | PME |
|---|---|---|---|---|---|---|---|
| **MOIC Contributions** | | | | | | | |
| Full Sample | 0.62 | 0.13 | 0.27 | 0.79 | −0.15 | 1.66 | 1.76 |
| | | | | | | | |
| **North America** | 0.71 | 0.14 | 0.28 | 0.90 | −0.25 | 1.78 | 1.77 |
| GP Contribution | 0.34 | 0.08 | 0.08 | 0.62 | | 1.13 | |
| Market Effect | 0.37 | 0.06 | 0.20 | 0.28 | | 0.91 | |
| | | | | | | | |
| **Europe** | 0.38 | 0.12 | 0.24 | 0.70 | 0.01 | 1.45 | 1.70 |
| GP Contribution | −0.07 | 0.05 | 0.03 | 0.47 | | 0.48 | |
| Market Effect | 0.45 | 0.07 | 0.21 | 0.23 | | 0.96 | |
| | | | | | | | |
| **Others** | 0.60 | 0.05 | 0.31 | −0.08 | 0.36 | 1.23 | 1.82 |
| GP Contribution | 0.24 | −0.08 | 0.19 | −0.40 | | −0.06 | |
| Market Effect | 0.36 | 0.13 | 0.12 | 0.32 | | 0.93 | |

Table 4: Value Creation Analysis by Geographic Region

|  | Revenue Growth | EBITDA Margin Expansion | EBITDA Multiple Expansion | Leverage | Debt Paydown | Total Value Creation | PME |
|---|---|---|---|---|---|---|---|
| **MOIC Contributions** | | | | | | | |
| Full Sample | 0.62 | 0.13 | 0.27 | 0.79 | −0.15 | 1.66 | 1.76 |
| | | | | | | | |
| **Before 2000** | 0.70 | 0.15 | −0.25 | 0.86 | 0.46 | 1.93 | 2.25 |
| GP Contribution | −0.14 | 0.14 | −0.14 | 0.68 | | 0.53 | |
| Market Effect | 0.85 | 0.01 | −0.10 | 0.18 | | 0.94 | |
| | | | | | | | |
| **2000-2007** | 0.66 | 0.07 | 0.17 | 0.88 | 0.02 | 1.79 | 2.04 |
| GP Contribution | 0.07 | 0.00 | 0.17 | 0.61 | | 0.84 | |
| Market Effect | 0.59 | 0.07 | 0.00 | 0.27 | | 0.93 | |
| | | | | | | | |
| **After 2008** | 0.59 | 0.18 | 0.39 | 0.70 | −0.32 | 1.54 | 1.49 |
| GP Contribution | 0.40 | 0.11 | 0.01 | 0.42 | | 0.94 | |
| Market Effect | 0.18 | 0.07 | 0.38 | 0.28 | | 0.92 | |

Table 5: Value Creation Analysis by Sub-period

| | Revenue Growth | EBITDA Margin Expansion | EBITDA Multiple Expansion | Leverage | Debt Paydown | Total Value Creation | PME |
|---|---|---|---|---|---|---|---|
| **MOIC Contributions** | | | | | | | |
| Full Sample | 0.62 | 0.13 | 0.27 | 0.79 | −0.15 | 1.66 | 1.76 |
| | | | | | | | |
| **Communication** | 0.50 | 0.06 | 0.09 | 0.64 | −0.25 | 1.03 | 1.67 |
| GP Contribution | 0.25 | 0.12 | −0.05 | 0.38 | | 0.69 | |
| Market Effect | 0.25 | −0.05 | 0.14 | 0.26 | | 0.60 | |
| | | | | | | | |
| **Consumer Discretionary** | 0.65 | 0.11 | 0.21 | 0.73 | 0.19 | 1.89 | 1.85 |
| GP Contribution | 0.08 | 0.03 | −0.03 | 0.38 | | 0.47 | |
| Market Effect | 0.56 | 0.08 | 0.24 | 0.35 | | 1.23 | |
| | | | | | | | |
| **Consumer Staples** | 0.47 | 0.17 | 0.33 | 0.95 | 0.04 | 1.96 | 2.07 |
| GP Contribution | 0.03 | 0.12 | 0.21 | 0.64 | | 1.00 | |
| Market Effect | 0.45 | 0.05 | 0.12 | 0.30 | | 0.92 | |
| | | | | | | | |
| **Financials** | 0.76 | −0.01 | 0.33 | 0.19 | 0.24 | 1.50 | 1.79 |
| GP Contribution | 0.51 | −0.15 | 0.42 | −0.51 | | 0.27 | |
| Market Effect | 0.24 | 0.13 | −0.09 | 0.70 | | 0.99 | |
| | | | | | | | |
| **Health Care** | 0.97 | 0.01 | 0.33 | 1.10 | −0.25 | 2.15 | 1.81 |
| GP Contribution | 0.58 | 0.09 | −0.06 | 0.91 | | 1.52 | |
| Market Effect | 0.39 | −0.08 | 0.38 | 0.18 | | 0.87 | |
| | | | | | | | |
| **Industrials** | 0.53 | 0.12 | 0.28 | 1.33 | −0.16 | 2.11 | 1.85 |
| GP Contribution | 0.15 | 0.01 | 0.15 | 1.05 | | 1.37 | |
| Market Effect | 0.38 | 0.11 | 0.13 | 0.28 | | 0.90 | |
| | | | | | | | |
| **Information Technology** | 0.59 | 0.26 | 0.34 | 0.68 | −0.33 | 1.54 | 1.60 |
| GP Contribution | 0.12 | 0.23 | 0.29 | 0.89 | | 1.53 | |
| Market Effect | 0.47 | 0.20 | 0.29 | 0.14 | | 1.10 | |
| | | | | | | | |
| **Materials** | 0.36 | 0.24 | 0.42 | 1.15 | −0.03 | 2.14 | 1.96 |
| GP Contribution | 0.13 | 0.23 | 0.29 | 0.89 | | 1.53 | |
| Market Effect | 0.23 | 0.01 | 0.13 | 0.26 | | 0.63 | |
| | | | | | | | |
| **Others** | 0.89 | −0.05 | 0.20 | 0.76 | −0.21 | 1.59 | 1.95 |
| GP Contribution | 0.68 | 0.10 | 0.12 | 0.37 | | 1.27 | |
| Market Effect | 0.20 | −0.15 | 0.08 | 0.40 | | 0.53 | |

Table 6: Value Creation Analysis by Industry

| | Revenue Growth | EBITDA Margin Expansion | EBITDA Multiple Expansion | Leverage | Debt Paydown | Total Value Creation | PME |
|---|---|---|---|---|---|---|---|
| **MOIC Contributions** | | | | | | | |
| Full Sample | 0.62 | 0.13 | 0.27 | 0.79 | −0.15 | 1.66 | 1.76 |
| | | | | | | | |
| **Small** | 1.34 | 0.26 | 0.61 | 1.05 | −0.38 | 2.88 | 2.32 |
| GP Contribution | 0.82 | 0.10 | 0.47 | 0.44 | | 1.83 | |
| Market Effect | 0.52 | 0.16 | 0.14 | 0.61 | | 1.42 | |
| | | | | | | | |
| **Medium** | 1.05 | 0.10 | 0.47 | 0.99 | −0.32 | 2.30 | 2.10 |
| GP Contribution | 0.63 | 0.01 | 0.24 | 0.46 | | 1.34 | |
| Market Effect | 0.42 | 0.10 | 0.24 | 0.53 | | 1.28 | |
| | | | | | | | |
| **Large** | 0.52 | 0.13 | 0.22 | 0.74 | −0.11 | 1.50 | 1.67 |
| GP Contribution | 0.14 | 0.07 | 0.03 | 0.52 | | 0.77 | |
| Market Effect | 0.37 | 0.06 | 0.19 | 0.22 | | 0.84 | |

Table 7: Value Creation Analysis by Deal Size