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VALUE CREATION IN PRIVATE EQUITY TRANSACTIONS: ACTIONS FOR MULTIPLE EXPANSION

CREACIÓN DE VALOR EN TRANSACCIONES DE PRIVATE EQUITY: ACCIONES PARA LA EXPANSIÓN DE MÚLTIPLOS

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CONTENTS

FIGURES

TABLES

ABBREVIATIONS

AuM	Assets under management
CAGR	Compound annual growth rate
CAPEX	Capital expenditures
DV	Dependent variable
EBIT	Earnings before interest and taxes
EBITDA	Earnings before interest, taxes, depreciation and amortization
FX	Foreign exchange
GP	General partner: A private equity fund's manager
IRR	Internal rate of return
KPI	Key performance indicator
LBO	Leveraged buyout
LP	Limited partner: An investor in a private equity fund
LPA	Limited partnership agreement
LTM	Last twelve month
MOM	Money multiple; also called CM, or cash multiple
P&L	Profit and loss statement
PPM	Post placement memorandum
ROI	Return on investment

DEFINITIONS

ACTIONS	Definition: Throughout this study, those strategies, measures, policies, and initiatives taken by GPs for the purpose of VALUE CREATION in their PORTFOLIO COMPANIES throughout the HOLDING PERIOD.
ADD-ONS	Definition: Also known as bolt-on acquisitions, ADD-ON acquisitions refer to acquisitions a GP is initiating for or through PORTFOLIO COMPANIES. Here, a typically larger PORTFOLIO COMPANY acquires a smaller entity to enhance operations, gain size (to effect economies of scale), realize synergies, or achieve a specific strategic objective such as diversifying product lines, expanding into new markets, or accessing complementary technologies. Reference: Rosenzweig et al. (1993), Gaughan (1999)
ARGOS INDEX	Definition: The ARGOS INDEX is a database serving as a benchmark created by Argos Wityu (formerly Argos Soditic), a European private equity firm, together with Epsilon Research. It has aggregated and analyzed transaction EBITDA MULTIPLES from actual private equity TRANSACTIONS across various industries and geographies for more than two decades. It serves as a reference for assessing industry cyclicity and market trends in valuation, aiding in deal pricing and benchmarking performance.
BUY & BUILD	Definition: A dedicated strategy—potentially even a dedicated focus strategy of the GP itself—in which several ADD-ONS are made to a PORTFOLIO COMPANY. The BUY & BUILD strategy is defined as a GP making four or more ADD-ONS to a PORTFOLIO COMPANY (and is arguably only successfully executed once this number is reached). Upon acquisition, the GPs integrate them into the PORTFOLIO COMPANY'S operations to achieve rapid expansion and market consolidation. This strategy involves acquiring companies with complementary products, services, or market presence, with the aim of leveraging synergies, economies of scale, and market dominance. Such a BUY & BUILD strategy is frequently realized in fragmented industries offering high potential to realize substantial synergies through economies of scale by reduction of overheads, professionalization, implementation of joint software solutions, etc.

	Reference: Hammer et al. (2017), Hammer et al. (2022), Gilligan and Galpin (2022), Preqin (2023)
CAGR	Calculated as: $$CAGR = \left(\left(\frac{EV}{BV} \right)^{\frac{1}{n}} - 1 \right) \times 100$$ where: *EV* = Ending value *BV* = Beginning value *n* = Number of years Definition: In the context of GP-led TRANSACTIONS, the CAGR is used, primarily in relation to the (anticipated) HOLDING PERIOD, to compute and compare average market growth rates with those of companies and their competitors. Due to volatility, year-on-year growth rates will likely be erratic and uneven. Therefore, the CAGR smooths returns when growth rates are expected to be volatile and inconsistent. The CAGR generates a geometric mean that can be used to compare different investments or (market) growth rates. Reference: Pignataro (2013)
DELEVERAGE	Calculated as: Δ in NET DEBT between ENTRY and EXIT of a TRANSACTION Definition: Referring to the cash contribution (or loss) of a PORTFOLIO COMPANY throughout the HOLDING PERIOD, potentially (if debt is used in a TRANSACTION) serving to repay acquisition debt between ENTRY and EXIT, and in any case, increasing (or decreasing) the EQUITY VALUE of a PARTICIPATION. Associated ACTIONS: Working capital profile, CAPEX, asset profile, leverage, terms of financing & repayment policy, dividend policy, recaps, tax shield Reference: Scholes et al. (1990), Berg and Gottschalg (2005)
EBITDA GROWTH	Calculated as: Δ in EBITDA between ENTRY and EXIT of a TRANSACTION multiplied by the EBITDA MULTIPLE at ENTRY

	Definition: The contribution in VALUE CREATION by growth (or decline) in EBITDA between ENTRY and EXIT. This combines top-line growth or loss (i.e., growth or loss in revenues) with any margin improvement/loss related to material expenses, personnel expenses, and other operating expenses. Associated ACTIONS: New markets, new products, market share, pricing, sourcing, operational improvement, productivity improvements. Reference: Brigl et al. (2008), Boucly et al. (2011)
(EBITDA) MULTIPLE	Definition: The relevant market multiple, usually derived from a mix of comparable TRANSACTIONS (of a reasonable number within a reasonably recent time frame, e.g., 3–5 years, depending on the availability of data) and listed peer companies (at an illiquidity discount of 20%–25%) corresponding to the firm's activity, sector, and industry. It is applied with a premium or discount to reflect the characteristics of the individual target company, such as overall shape, feasible growth prospects, and corresponding return profile for the GP. The process of deriving relevant MULTIPLES at ENTRY, throughout the HOLDING PERIOD, and at EXIT involves internal skills and market know-how, particularly during the TRANSACTIONS. However, the process itself entails triangulation between parties, several trusted or professional sources, reflection with advisors, market pre-sounding, and LPs, and, with this, among experienced market participants. Reference: Bhojraj and Charles (2002), Eaton et al. (2021)
ENTERPRISE VALUE	Calculated as: A company's EBITDA × the relevant EBITDA MULTIPLE Definition: The calculated total value of a company. Reference: Plenborg and Pimentel (2016), Lie and Lie (2002)
ENTRY	Definition: The initial purchase of a company by a GP and the beginning of the HOLDING PERIOD. A company becomes a PORTFOLIO COMPANY in a GP's fund.

EQUITY VALUE	Calculated as: ENTERPRISE VALUE plus (or minus) NET CASH (NET DEBT), respectively Definition: The value of a firm attributable to its (equity) shareholders. Reference: Axelson et al. (2009), Cohn et al. (2022)
EXIT	Definition: The sale of a PORTFOLIO COMPANY by a GP and the end of the HOLDING PERIOD. A company ceases to be a PORTFOLIO COMPANY in a GP's fund.
HOLDING PERIOD	Definition: The time between EXIT and ENTRY, typically 4–6 years, in which a company is partially or fully owned by funds managed by a GP.
HURDLE RATE	Definition: Regarding the distribution of proceeds from private equity funds and corresponding carried interest payments, a preferred annual return rate (typically 8.0%) on a fund's invested capital, upon which all returns (for the avoidance of doubt, in cash) of a fund belong to the LPs. Once the HURDLE RATE is achieved, it is commonly followed by a catch-up period during which the GP receives the full proceeds of the fund until a split of typically 80:20 (LP:GP) is reached. Thereafter, any proceeds are split 80:20 between the LP and GP. Reference: Axelson et al. (2009), Preqin Pro (2021).
IRR	Calculated as: $$0 = \mathrm{NPV} = \sum_{t=1}^{T} \frac{C_t}{(1+IRR)^t} - C_0$$ where: C_t = Net cash inflow during the period t C_0 = Total initial investment costs IRR = The internal rate of return t = The number of time periods

	Definition: Internal rate of return is a metric in financial assessment that gauges the potential profitability of investments. It is essentially the discount rate at which the Net Present Value (NPV) of cash flows reaches zero in discounted cash flow analysis. Thus, the IRR does not represent an investment's actual cash return but rather its annual return as a percentage. Obviously, a higher IRR signals a more enticing investment opportunity. Its uniformity and expression as a percentage enable straightforward comparisons of investment opportunities. Reference: Patrick and French (2016)
LSE CAPEX	Meaning: Late-stage expansion capital expenditures refer to investments in tangible assets made in excess of depreciation in the year of the GP's EXIT. Reference: Richardson (2006)
LS R&D	Definition: Late-stage research and development expenditures refer to investments in intangible assets made in excess of depreciation in the year of the GP's EXIT. Reference: Richardson (2006)
MANAGER Δ	Definition: Referring to the change of one or several leading executives or managers in a PORTFOLIO COMPANY throughout the HOLDING PERIOD.
MOM	Definition: Multiple of Money, representing the ratio between the total cash inflows received throughout the HOLDING PERIOD and at EXIT, and the total cash outflows the GP has made at ENTRY and throughout the HOLDING PERIOD.
MULTIPLE-BASED VALUATION	Definition: In the case of GP-led TRANSACTIONS, the typical valuation method, in which the relevant EBITDA of a firm is multiplied by a relevant EBITDA MULTIPLE. Hereby, EBITDA has established itself as the most-used figure. A company's asset heaviness (requirements in CAPEX and consequentially in depreciation) is reflected in the EBITDA MULTIPLE. EBIT MULTIPLES are considered alternatively or for

	alignment when companies show very high discrepancies between EBITDA and EBIT (as a result of very high depreciation). Below EBIT-numbers are mostly irrelevant for MULTIPLE-BASED VALUATION. Any debt is typically repaid to the existing lenders during a TRANSACTION. With this, a firm will usually have a new financing structure post-transaction. With the change in its financing structure, the tax payments will also change, meaning that taxes are neither of interest here nor of relevance to valuation. Reference: Vydrzel and Soukupová (2012), Sharma (2019)
MULTIPLE EXPANSION	Calculated as: Δ in EBITDA MULTIPLE between the two TRANSACTIONS at the ENTRY and the EXIT of a PORTFOLIO COMPANY multiplied by the EBITDA at EXIT. Definition: The amount of VALUE CREATION gained (or lost) by selling a PORTFOLIO COMPANY at a higher (or lower) EBITDA MULTIPLE than that at which it was purchased. Associated ACTIONS: To be verified in this study Reference: Vester (2011), Achleitner et al. (2010)
NET DEBT and NET CASH	Calculated as the total of cash and cash equivalents and marketable securities (investments that can be easily converted into cash and other liquid assets) minus bank liabilities, such as term loans, revolving credit facilities, and other borrowings, bonds and other debt instruments, shareholder loans, provisions, and other long-term liabilities. As companies are typically financed though debt (for various reasons), the difference is typically a negative number and is therefore referred to as NET DEBT, which is subtracted from the ENTERPRISE VALUE to derive the EQUITY VALUE. However, it could equally be a positive number, in which case it is referred to as NET CASH and added to the ENTERPRISE VALUE to derive the EQUITY VALUE. What is included and considered as NET DEBT may be subject to negotiation. Such positions can, amongst others, include non-distributable or operative cash, prepayments, net working capital adjustments, and provisions.

	Reference: Mellen and Evans (2018), Corporate Finance Institute (2022)
NWC	Definition: Net working capital is the sum of inventories and trade receivables minus trade payables. Its intra-year as well as year-on-year swings and development are particularly relevant to a company's (short-term) liquidity. Depending on specific inherent factors of the business model, such as seasonality, the extent of inventory needed, customer payment terms, and the company's own payment terms with suppliers, revenue growth may or may not be accompanied by an increase in NWC, that needs to be financed. The development of NWC must, therefore, be considered in TRANSACTIONS, potentially reducing cash generation and the company's ability to pay down acquisition debt for DELEVERAGE. Reference: Zutter and Smart (2022)
PARTICIPATION	Definition: This term typically refers to the ownership stake that a fund advised by a GP has in a PORTFOLIO COMPANY.
PORTFOLIO COMPANY	Definition: This term refers to a company partially or totally owned by funds advised by a GP.
STRATEGIC EXIT (STEXIT)	Definition: In the context of this study, a PORTFOLIO COMPANY that is sold to a strategic buyer, i.e., a corporation, instead of a GP at EXIT (or any other form of EXIT). Reference: Bargeron et al. (2008), Gorbenko and Malenko (2014)
STREFOC	Definition: Strategic refocus and complexity reduction comprises major strategic initiatives initiated by GPs with PORTFOLIO COMPANIES on acquisition, particularly via acquiring spin-offs, and throughout the HOLDING PERIOD, including refocusing, launching or discontinuing business segments, outsourcing non-core activities, rolling out to new markets and divesting business units independently.
TRANSACTION	Definition: In the context of this study, either the purchase (ENTRY) or the sale (EXIT) of a company by a GP.

VALUE CREATION	Calculated as: EBITDA GROWTH × MULTIPLE EXPANSION + DELEVERAGE Definition: Tantamount to the increase (or decline) in EQUITY VALUE between the total EQUITY VALUE (100%) invested at ENTRY and realized at EXIT with a PORTFOLIO COMPANY, and with this equivalent to the total gross cash increase (or loss) realized from the two TRANSACTIONS. Reference: Kaplan and Stromberg (2009), Schlegel (2019)

ABSTRACT

This study examines private equity TRANSACTIONS. Specifically, it focuses on the strategies, measures, policies, and initiatives (ACTIONS) initiated by private equity fund managers (GPs) to achieve MULTIPLE EXPANSION, or the sale of a PORTFOLIO COMPANY at a higher EBITDA MULTIPLE than that at which it was purchased. MULTIPLE EXPANSION is one of the three components of VALUE CREATION, defined as the difference in EQUITY VALUE between the ENTRY and EXIT of a PORTFOLIO COMPANY.

The study situates this concept within the broader context of MULTIPLE-BASED VALUATION, the predominant valuation method used in the private equity industry. Changes in EQUITY VALUE between ENTRY and EXIT can be mathematically attributed to three sources: changes in EBITDA (EBITDA GROWTH), changes in the EBITDA MULTIPLE (MULTIPLE EXPANSION), and changes in NET DEBT (DELEVERAGE). While the academic literature has extensively explored EBITDA GROWTH and DELEVERAGE as outcomes of ACTIONS initiated by GPs, little is known about deliberate ACTIONS aimed at securing MULTIPLE EXPANSION.

This study aims to fill this gap by demonstrating the relevance of MULTIPLE EXPANSION as a significant aspect and inherent value-altering factor of VALUE CREATION actively targeted by GPs. Using a proprietary deal-level dataset, several statistical tests and regression analyses are conducted to find evidence to support the hypotheses that each of LATE-STAGE EXPANSION CAPEX, LATE-STAGE R&D, STRATEGIC REFOCUS, and ADD-ON acquisitions have a significant positive effect on MULTIPLE EXPANSION.

The evidence supports both LATE-STAGE EXPANSION CAPEX and ADD-ON acquisitions. For LATE-STAGE R&D and STRATEGIC REFOCUS, the study finds a significant positive effect on MULTIPLE EXPANSION, if the interaction term of both variables is examined.

Keywords: Value creation, Multiple expansion, Private equity, Late-stage expansion CapEx, Late-stage R&D, Strategic refocus, Add-ons

ABSTRACT SPANISH

Este estudio examina las TRANSACTIONS de private equity. En particular, se centra en las estrategias, medidas, políticas e iniciativas (ACTIONS) implementadas por los gestores de fondos de private equity (GPs) para lograr la MULTIPLE EXPANSION, es decir, la venta de una PORTFOLIO COMPANY a un EBITDA MULTIPLE superior al de su compra. La MULTIPLE EXPANSION es uno de los tres componentes de la VALUE CREATION, definida como la diferencia en EQUITY VALUE entre la ENTRY y la EXIT de una PORTFOLIO COMPANY.

El estudio sitúa este concepto dentro del contexto más amplio de la MULTIPLE-BASED VALUATION, el método de valoración predominante en la industria de private equity. Los cambios en el EQUITY VALUE entre la ENTRY y la EXIT pueden atribuirse matemáticamente a tres fuentes: cambios en EBITDA (EBITDA GROWTH), cambios en el EBITDA MULTIPLE (MULTIPLE EXPANSION) y cambios en NET DEBT (DELEVERAGE). Aunque la literatura académica ha explorado extensamente el EBITDA GROWTH y el DELEVERAGE como resultados de ACTIONS iniciadas por los GPs, se sabe poco sobre las ACTIONS deliberadas dirigidas a lograr la MULTIPLE EXPANSION.

Este estudio tiene como objetivo llenar este vacío, demostrando la relevancia de la MULTIPLE EXPANSION como un aspecto significativo y un factor inherente en la alteración del valor dentro de la VALUE CREATION , activamente dirigido por los GPs. Utilizando un conjunto de datos exclusivo al nivel de las transacciones, se realizan varias pruebas estadísticas y análisis de regresión para encontrar evidencia que respalde las hipótesis de que cada uno de los LATE-STAGE EXPANSION CAPEX, LATE-STAGE R&D, STRATEGIC REFOCUS y las adquisiciones complementarias (ADD-ONS) tienen un efecto positivo significativo en la MULTIPLE EXPANSION.

Los análisis respaldan tanto el LATE-STAGE EXPANSION CAPEX como las ADD-ONS. En el caso del LATE-STAGE R&D y el STRATEGIC REFOCUS, el estudio encuentra un efecto positivo significativo en la MULTIPLE EXPANSION , si se examina el término de interacción de ambas variables.

1 INTRODUCTION

This study focuses on private equity TRANSACTIONS and links a set of ACTIONS taken by private equity fund managers (General Partners, or GPs) to achieve MULTIPLE EXPANSION. MULTIPLE EXPANSION is defined as the sale of a PORTFOLIO COMPANY at a higher EBITDA MULTIPLE than that at which it was purchased and is one of the three components of VALUE CREATION—that is, the difference in EQUITY VALUE between the ENTRY and EXIT (Schlegel, 2019). MULTIPLE-BASED VALUATION is the generally accepted and most commonly used valuation method in the private equity industry (see, e.g., Schueler, 2020; Sharma, 2019). In line with MULTIPLE-BASED VALUATION, any increase or decrease in EQUITY VALUE between ENTRY and EXIT can be mathematically attributed to three sources: Δ in EBITDA (known as EBITDA GROWTH), Δ in EBITDA MULTIPLE (known as MULTIPLE EXPANSION) and Δ in NET DEBT (known as DELEVERAGE).

The literature has acknowledged both EBITDA GROWTH (e.g., Boucly et al., 2011), and DELEVERAGE (e.g., Lopez-de-Silanes et al., 2015) as the outcomes of ACTIONS initiated by private equity fund managers. However, less research exists on MULTIPLE EXPANSION. Researchers have variously attributed MULTIPLE EXPANSION to chance (Korteweg and Sorensen, 2017), viewed it as an outcome of economic cycles or of buying below (or selling above) market prices (Demiroglu and James, 2010), or considered it to be dependent to some degree on negotiation skills (Puche and Braun, 2019). MULTIPLE EXPANSION has not been associated with an active strategy or incentive (ACTION) initiated by the private equity fund manager. This view is supported by Achleitner et al. (2010), who add that there is no universally applied methodology for measuring the importance of the different components of VALUE CREATION. Achleitner et al. (2011) confirm that few studies have examined its mechanisms—and therefore GP returns—and that most studies have failed to analyze VALUE CREATION using a comprehensive framework.

More recently, Puche and Braun (2019) confirm that defining dedicated ACTIONS aimed at achieving MULTIPLE EXPANSION aligns with the growing interest in MULTIPLE EXPANSION. This couples with a rising share of MULTIPLE EXPANSION in overall VALUE CREATION seen in the private equity market in recent years (Bain, 2020). Hereby, the

study also seeks to address a widespread misinterpretation of GPs' socio-economic behaviors, the capacity of formerly overlooked ACTIONS to create value, and the specific importance of MULTIPLE EXPANSION.

To demonstrate the relevance of MULTIPLE EXPANSION for VALUE CREATION, this study will place existing literature on ACTIONS that are known to be correlated with returns in private equity TRANSACTIONS in the context of accounting and private equity valuation standards, and specifically MULTIPLE-BASED VALUATION. Unlike studies evaluating private equity performance from a fund perspective, this study develops a framework that explicitly shows how value is created via each component (i.e., EBITDA GROWTH, DELEVERAGE, and MULTIPLE EXPANSION).

As the study progresses, it will become evident that, rooted in MULTIPLE-BASED VALUATION, none of the components of VALUE CREATION—EBITDA GROWTH, MULTIPLE EXPANSION, and DELEVERAGE—remain static or at zero during the HOLDING PERIOD. Addressing all three with specific ACTIONS offers GPs the best opportunity to maximize returns. VALUE CREATION models used by practitioners and academics (e.g., Pindur, 2007; Loos, 2006) distinguish between EBITDA GROWTH, MULTIPLE EXPANSION, and DELEVERAGE. As Vester (2011) suggests, linking specific components of VALUE CREATION to ACTIONS during the HOLDING PERIOD could reveal what worked and what did not.

Through the framework applied in this study, it will become visible which ACTIONS (consisting of strategies, measures, and initiatives) initiated by GPs are directed at which of the three components of VALUE CREATION. Hence, this study contributes to filling the existing gaps in the literature and adds value by providing a new understanding of approaches to, and the relevance of, MULTIPLE EXPANSION as a crucial part of VALUE CREATION. It explores the underlying mechanisms between a set of ACTIONS as predictors and the outcome, MULTIPLE EXPANSION, as a core component of VALUE CREATION. Confirming distinct ACTIONS for MULTIPLE EXPANSION in the maturing private equity landscape would offer important insights for academics, GPs, and managers.

Private equity funds take ACTIONS directed at achieving MULTIPLE EXPANSION, which can be identified and distinguished from other ACTIONS aimed at achieving EBITDA GROWTH and DELEVERAGE. Based on a decade of experience in the private equity industry obtained while working for several private equity funds, the author will provide up-to-date insights into private equity TRANSACTIONS and VALUE CREATION practices in a maturing industry facing increasing pressure on returns. Given current market dynamics, the author will explain how successful private equity fund managers follow a straightforward approach and develop a set of individual ACTIONS aimed at generating returns on acquiring a target firm. Eventually, these are pursued (or redesigned) throughout the HOLDING PERIOD until the PORTFOLIO COMPANY'S sale.

1.1 INTRODUCTION SPANISH

Este estudio se centra en las TRANSACTIONS de private equity y vincula un conjunto de ACTIONS tomadas por los gestores de fondos de private equity (General Partners, o GPs) para lograr la MULTIPLE EXPANSION. La MULTIPLE EXPANSION se define como la venta de una PORTFOLIO COMPANY a un EBITDA MULTIPLE superior al de su compra y es uno de los tres componentes de la VALUE CREATION, que representa la diferencia en EQUITY VALUE entre la ENTRY y la EXIT (Schlegel, 2019). La MULTIPLE-BASED VALUATION es el método de valoración generalmente aceptado y más utilizado en la industria de private equity (ver, por ejemplo, Schueler, 2020; Sharma, 2019). Siguiendo este método, cualquier aumento o disminución en EQUITY VALUE entre la ENTRY y la EXIT puede atribuirse matemáticamente a tres fuentes: Δ en EBITDA (conocido como EBITDA GROWTH), Δ en EBITDA MULTIPLE (conocido como MULTIPLE EXPANSION) y Δ en NET DEBT (conocido como DELEVERAGE).

La literatura ha reconocido tanto el EBITDA GROWTH (e.g., Boucly et al., 2011) como el DELEVERAGE (e.g., Lopez-de-Silanes et al., 2015) como resultados de ACTIONS iniciadas por los gestores de fondos de private equity. Sin embargo, existe menos investigación sobre la MULTIPLE EXPANSION. Los investigadores han atribuido la MULTIPLE EXPANSION a factores aleatorios (Korteweg and Sorensen, 2017), la han visto

como resultado de ciclos económicos o de comprar (o vender) por encima de los precios de mercado (Demiroglu y James, 2010), o la han considerado dependiente, en cierta medida, de las habilidades de negociación (Puche and Braun, 2019). Hasta la fecha, la MULTIPLE EXPANSION no se ha asociado con una estrategia activa o un incentivo (ACTION) iniciado por los gestores de fondos de private equity. Esta visión es respaldada por Achleitner et al. (2010), quienes además señalan que no existe una metodología universalmente aplicada para medir la importancia de los diferentes componentes de la VALUE CREATION.

Achleitner et al. (2011) confirman que pocos estudios han examinado los mecanismos de la VALUE CREATION—y por lo tanto los retornos de los GPs—y que la mayoría no ha logrado analizarla utilizando un marco integral. Más recientemente, Puche y Braun (2019) confirman que la definición de ACTIONS dedicadas a lograr la MULTIPLE EXPANSION se alinea con el creciente interés en este componente , junto con el aumento de la participación de la MULTIPLE EXPANSION en la VALUE CREATION total observada en el mercado de private equity en los últimos años (Bain, 2020). Con ello, el estudio también busca abordar una malinterpretación generalizada sobre los comportamientos socioeconómicos de los GPs, la capacidad de ACTIONS anteriormente pasadas por alto para crear valor, y la importancia específica de MULTIPLE EXPANSION. Para demostrar la relevancia de la MULTIPLE EXPANSION en la VALUE CREATION, este estudio situará la literatura existente sobre ACTIONS que se sabe están correlacionadas con los retornos en las TRANSACTIONS de private equity dentro del contexto de las normas contables y de valoración propias de la industria de private equity, y en concreto, la MULTIPLE-BASED VALUATION. A diferencia de los estudios que evalúan el desempeño del private equity desde una perspectiva de fondo, este estudio desarrolla un marco que muestra explícitamente cómo se crea valor en cada componente (es decir, EBITDA GROWTH, DELEVERAGE y MULTIPLE EXPANSION). A medida que avance el estudio, se hará evidente que, fundamentado en MULTIPLE-BASED VALUATION, ninguno de los componentes de VALUE CREATION—EBITDA GROWTH, MULTIPLE EXPANSION y DELEVERAGE—permanece estático o en cero durante el HOLDING PERIOD. Abordar los tres con ACTIONS específicas ofrece a los GPs la mejor oportunidad para maximizar los retornos. Los modelos de VALUE CREATION utilizados

por profesionales y académicos (e.g., Pindur, 2007; Loos, 2006) diferencian entre EBITDA GROWTH, MULTIPLE EXPANSION y DELEVERAGE. Como sugiere Vester (2011), vincular los componentes específicos de VALUE CREATION con las ACTIONS realizadas durante el HOLDING PERIOD podría revelar qué estrategias funcionaron y cuáles no.

A través del marco aplicado en este estudio, será evidente qué ACTIONS (que incluyen estrategias, medidas e iniciativas) iniciadas por los GPs están dirigidas a cada uno de los tres componentes de la VALUE CREATION. Por lo tanto, este estudio contribuye a llenar los vacíos existentes en la literatura y añade valor al proporcionar una nueva comprensión de los enfoques y la relevancia de la MULTIPLE EXPANSION como una parte crucial de la VALUE CREATION. Explora los mecanismos subyacentes entre un conjunto de ACTIONS como predictores y el resultado, la MULTIPLE EXPANSION, como un componente central de la VALUE CREATION. Confirmar ACTIONS específicas para MULTIPLE EXPANSION en el panorama de crecimiento y proceso de maduración del private equity ofrecería importantes perspectivas para académicos, GPs y managers.

Los fondos de private equity toman ACTIONS dirigidas a lograr la MULTIPLE EXPANSION, las cuales pueden identificarse y distinguirse de otras ACTIONS orientadas a lograr el EBITDA GROWTH y el DELEVERAGE. Basado en una década de experiencia en la industria de private equity obtenida trabajando para varios fondos de private equity, el autor proporcionará perspectivas actualizadas sobre las TRANSACTIONS y las prácticas de VALUE CREATION en una industria en maduración que enfrenta una creciente presión sobre los retornos. Ante la dinámica actual del mercado, el autor explicará cómo los gestores exitosos de fondos de private equity siguen un enfoque claro y desarrollan un conjunto de ACTIONS individuales destinadas a generar retornos al adquirir una empresa objetivo. Eventualmente, estas ACTIONS se implementan (o rediseñan) durante todo el HOLDING PERIOD hasta la venta de la PORTFOLIO COMPANY.

2 LITERATURE REVIEW

2.1 CONCEPT OF A PRIVATE EQUITY FUND

This chapter lays the foundation for the dissertation by defining private equity funds, their activities, and how they are reflected in the academic literature alongside current market dynamics.

The German private equity market has developed into a mature and highly professional industry over the past several decades. Private equity is a form of investing. Typically, a private equity firm acts as the GP of one or several funds to which primarily institutional investors (Limited Partners or LPs) commit capital. LPs include, amongst others, pension funds, endowment funds, fund of funds, and family offices. The focus of the fund is described in the post-placement memorandum (PPM), which covers aspects such as industries, sectors, TRANSACTION sizes, strategic focus, specialization, majority or minority shareholding, duration, and so on.

The year of the establishment of a fund is called the vintage year. The fund is structured around two distinct phases: the investment period, during which the GP can draw capital from the LPs for investments, and the harvesting period, during which the GP is expected to return proceeds to the LPs. In detail, the GP is mandated to execute equity PARTICIPATIONS in mostly privately held companies[1] during a specific investment period of typically 5 years. The investment period is followed by a harvesting period of typically 5 years, in which the GP must not engage in new investments (ADD-ONS are allowed in many cases) but has time to develop the PORTFOLIO COMPANIES until it finally sells them. Visualize in this context that for each PORTFOLIO COMPANY, including those acquired near the end of the investment period, the GP typically requires a HOLDING PERIOD of 4 to 6 years for VALUE CREATION to achieve the desired return before it can EXIT. Both the investment and harvesting period can often be extended, typically by 1 year (5+1 and 5+1).

[1] *In some cases, PARTICIPATIONS may also involve listed companies with the ambition to take them private after the TRANSACTION (Wood and Wright, 2009).*

Whenever a GP sells a PORTFOLIO COMPANY, it returns all capital gained from its PARTICIPATION to the LPs (Robinson and Sensoy, 2016). Before the fund terminates, the GP must have divested all PORTFOLIO COMPANIES (Burth and Reißig-Thust, 2019). With 10+2 years in total, the lifetime of a private equity fund is reasonably long compared to other asset classes. Once an LP has committed to providing capital to a fund, there are only limited possibilities for withdrawing from this commitment. Typically, such withdrawal results from extraordinary events—for instance, the loss of key personnel on the side of the GP or misconduct. If the blame does not lie with the GP and is not among the extraordinary events specified, a withdrawal or failure of payment would result in a severe contractual penalty, including partial or total loss of the invested capital of the LP. The long-term nature of private equity funds and the limitations surrounding the liquidation of the investment into a fund at any given time, alongside other factors, explain why private equity is not a very common form of investing for private persons, with the exception of high-net-worth individuals.

The LPs do not transfer the committed capital to the GP at the fund's inception, as confirmed by Robinson and Sensoy (2016). Instead, throughout the investment period, the GP can typically, at any time, demand capital (via a capital call) from the LPs to execute TRANSACTIONS. The rules governing such TRANSACTIONS are set out in the limited partnership agreement (LPA) and include, amongst other things, the maximum percentage of the fund size the GP can allocate to a single TRANSACTION, the regions the GP can invest in, exclusions, and the timeframe. Typically, the LPA also includes clauses regarding the constitution of the partnership; capital contributions and commitments; drawdowns; management and operation of the partnership; investment policy and restrictions; allocations and distributions; management fees; assignment of interests; termination and liquidation; accounts, reports, and auditors; meetings of investors and the advisory board; and withdrawal of LPs.

The GP charges the LPs management fees in accordance with the LPA (typically an annual fee amounting to 1.5% to 2.0% of the fund size). Preqin Pro (2021) find for the management fees a mean of 1.94% and a median of 2.00%. In addition, the GP receives carried interest payments on the profits. The market standard carried interest

rate is 20% of any profits above a preferred rate of return for the LPs (HURDLE RATE) of 8.0% (Preqin Pro, 2021). This has been described in the literature by Axelson et al. (2009), who acknowledge that GPs hold most decision rights, too. Axelson et al. (2009) also note, however, that GPs receive a percentage of the profits, which is junior to all other claims. This view is overly simplistic; instead, it is the HURDLE RATE mentioned above (minimum interest) that funds must achieve before the GPs receive a catch-up. To illustrate, the LPs would first obtain all the returns until they achieve an 8% yearly return on their capital. After this hurdle is met, the next set of profits will be distributed in such a way that the GPs receive the majority of the profits (often 100%) until the agreed-upon 20:80 (GP:LP) split of profits is achieved. This is the GP's catch-up period. Any remaining profits are then distributed according to the 20:80 profit split.

Typically, the GP does not aim to withdraw any dividends throughout its HOLDING PERIOD in a given firm but instead focuses on realizing its profits upon selling its PORTFOLIO COMPANY, as documented by Wright et al. (2009). The main motive of GPs is to increase the EQUITY VALUE of the PORTFOLIO COMPANY throughout the HOLDING PERIOD—that is, VALUE CREATION, which it realizes through dedicated ACTIONS.

In fundraising, the GP will be in close exchange with several LPs who will eventually commit capital to the fund. Technically, the LPs will enter the LPA through a legal document called the form of adherence, constituting their commitment. Each private equity fund has a defined target volume. Upon reaching a certain amount of commitments (typically defined as a percentage of the target volume), the GP can constitute the fund (e.g., EUR 100m; 65% = EUR 65m). This event is called the first closing of the fund. After the first closing, the GP can initiate TRANSACTIONS while continuing fundraising efforts to achieve the target size.

Similarly, the high end is typically capped at a specific target size—that is, the maximum volume of the fund. On reaching this maximum volume, the GP will not accept any further commitments. Both the minimum amount for the first closing and the hard cap of a fund are closely related to the investment strategy, which guarantees a certain degree of diversification for the LPs while pursuing a particular target market and target investment size. Therefore, if a fund does not reach the intended target size,

the GP would make either fewer or smaller investments[2]. On the other hand, if the volume of the fund is substantially larger, the GP would need to make larger TRANSACTIONS by investing in larger companies or buying more firms. In both cases, this outcome would deviate from the strategy intended and agreed upon in the LPA with the LPs. Finally, a successful GP will manage not one but a series of funds (Korteweg and Sorensen, 2017).

2.2 PRIVATE EQUITY TRANSACTIONS AND MARKET ENVIRONMENT

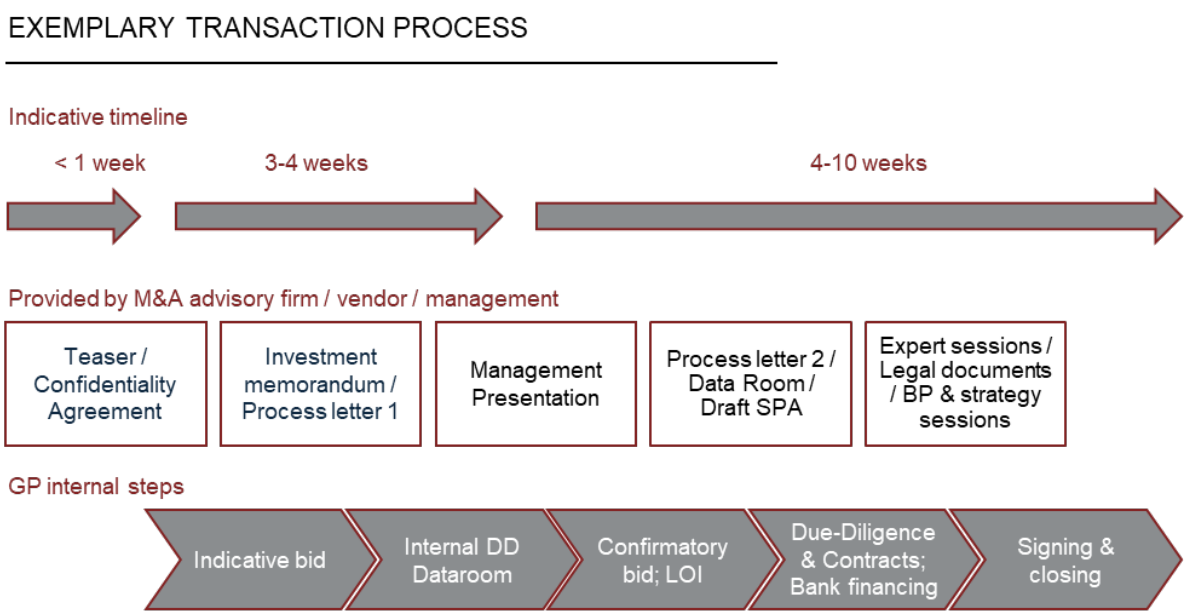
Once a private equity fund is established with the fund's first closing, the GP will begin to identify appropriate target companies to deploy the collected funds. This process is referred to as deal-sourcing and deal-making (Gilligan and Wright, 2021).

The private equity markets have significantly matured over the past decades. When considering the sale of a company, most vendors increasingly seek the professional advice of focused M&A advisory firms or investment banks (Batjargal and Liu, 2004). These advisory services, which initially focused on large-cap TRANSACTIONS, expanded to mid-cap throughout the 2000s and have since extended to small-cap. Moreover, a high share of TRANSACTIONS are secondaries, in which a GP buys a firm from another financial investor, as opposed to primaries, in which the GP buys a firm from the founders or owner families. Consequently, a GP will find only very few proprietary deals in which it can analyze, carry out due diligence, and negotiate a TRANSACTION directly with the vendor, without intermediaries, and without (or with limited) competition. Instead, most TRANSACTIONS now occur as an auction process in which the GP must fulfill specific steps outlined by the advisor before finally earning the chance to complete the TRANSACTION (Cumming et al., 2007). The GP often incurs substantial transaction costs (consisting of internal expenses, costs associated with due diligence, and advisory fees), with no guarantee that it will succeed in buying the target firm, which may be sold by the vendors to a third party at any time.

[2] *For the sake of doubt: To reach the fund size, it would involve either fewer larger investments or a greater number of smaller investments, not both*.

Ahlers et al. (2014) have documented the fierce competition and TRANSACTION complexity inherent in today's private equity market, and their impact on the GP's business. The level of competition is far higher for large-cap TRANSACTIONS and lower for small-cap TRANSACTIONS. Typically, the larger or more professional the advisory firms (up to the level of large-scale investment banks), the broader and more rigid the auction processes will be. Obviously, large advisory firms aim to earn higher fees and focus on selling large firms in wide auctions with greater market attention. Increased competition in auction processes typically results in higher prices for buyers. A typical M&A process managed by an M&A advisory firm will consist of the steps displayed in Figure 1.

FIGURE 1: EXEMPLARY M&A PROCESS (ADVISOR-MANAGED)



Source: Own figure/analysis

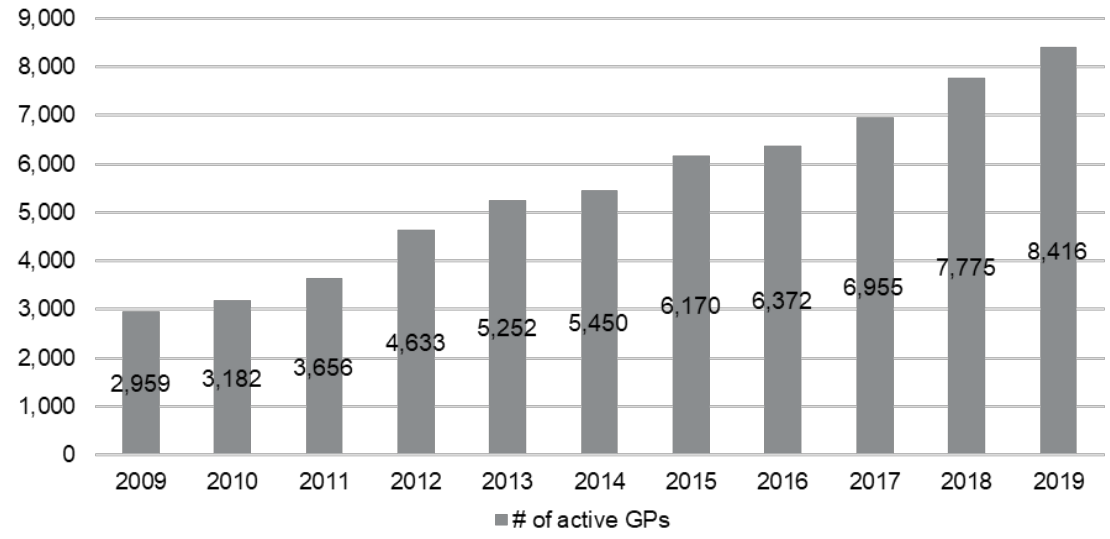
From a vendor's perspective, a strict process in which several bidders must simultaneously stick to a tight timeframe makes sense in many respects. A firm's likelihood of being sold is substantially higher if offered to several bidders in an auction instead of being marketed to a single party in a direct deal. This puts pressure on the competing bidders. Shorter schedules limit the time buyers have to conduct due diligence, requiring them to focus on the most critical aspects within the respective

disciplines—financial, legal, tax, commercial, and, more recently, IT, software, environmental, ESG, and insurance. While advisors usually provide a large number of fundamentally required documents in a virtual data room, specifically required documents are often only provided or even generated on request. Hereby, advisors often restrict the number of questions bidders and their advisors can submit. The resulting need for focus and prioritization within the respective disciplines may ultimately lead to other potentially relevant issues being overlooked or missed. On top, transaction costs, which will be charged to the fund if the TRANSACTION fails, may negatively impact returns. This may tempt GPs—once engaged in due diligence—to pay the limit of what is economically reasonable in tight competition. In an auction, the GP may need to raise its offer price multiple times during the M&A process to outbid competitors. Puche et al. (2016) discuss such rivalry in TRANSACTIONS and its implications for GPs.

GPs regularly attempt to deviate from the (M&A advisor) outlined processes and accelerate TRANSACTIONS—for instance, via a pre-emptive bid—to increase their chances of success. This involves contracting external consultants—such as financial, commercial, tax, and legal advisory firms—for due diligence and taking money at risk with even less security to win the deal. It may also include waiving or delaying certain aspects of due diligence until after closing. Additionally, GPs may opt to secure all-equity financing upfront (with plans to recapitalize, reduce equity, or secure shareholder loans) instead of pursuing bank financing immediately after the TRANSACTION). The investment process, market screenings, and auctions have been described by Batjargal and Liu (2004) and De Clercq and Sapienza (2006), among others. There is extensive literature on due diligence and its challenges (e.g., Crilly et al., 2013). Likewise, Cumming et al. (2007) discuss the complexity of negotiating a TRANSACTION for the GP while considering financial, tax, and legal issues.

Besides these dynamics described at the micro level, at the macro level, the characteristics of the private equity markets show a fundamental increase in the number of active GPs between 2009 and 2019 (with a compound annual growth rate, or CAGR, of 11.0%), as shown in Figure 2.

FIGURE 2: NUMBER OF GLOBALLY ACTIVE GPS, 2009–2019

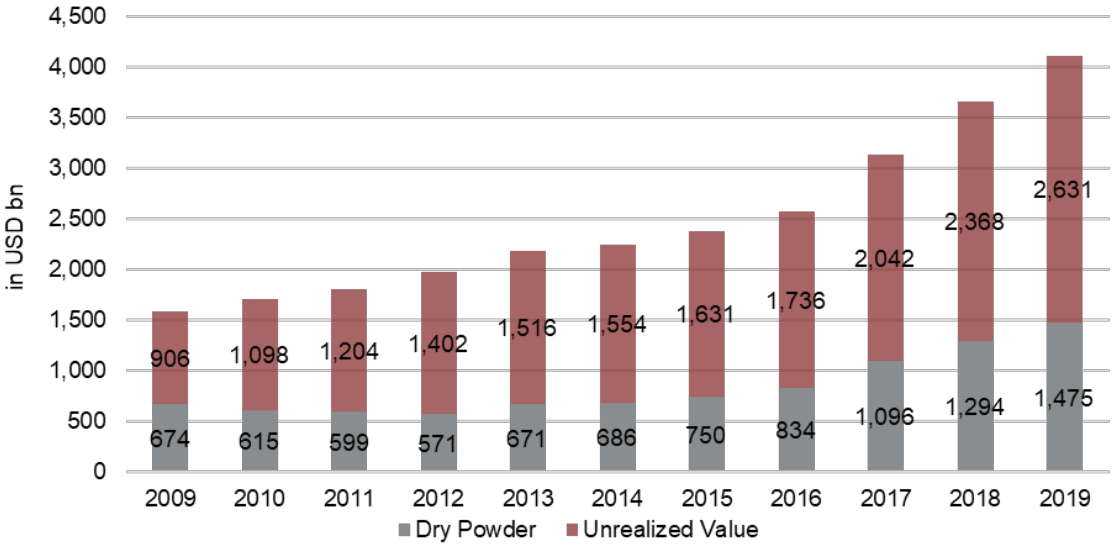


Source: Preqin (2021)

Note: No update of statistics was provided thereafter by Preqin

At the same time, global private equity assets under management increased by a CAGR of 10.0% between 2009 and 2019 to USD 4.106bn, consisting of dry powder (money available for drawdown) of USD 1.475bn and unrealized value of USD 2.631bn, as shown in Figure 3.

FIGURE 3: GLOBAL PRIVATE EQUITY ASSETS UNDER MANAGEMENT, 2009–2019

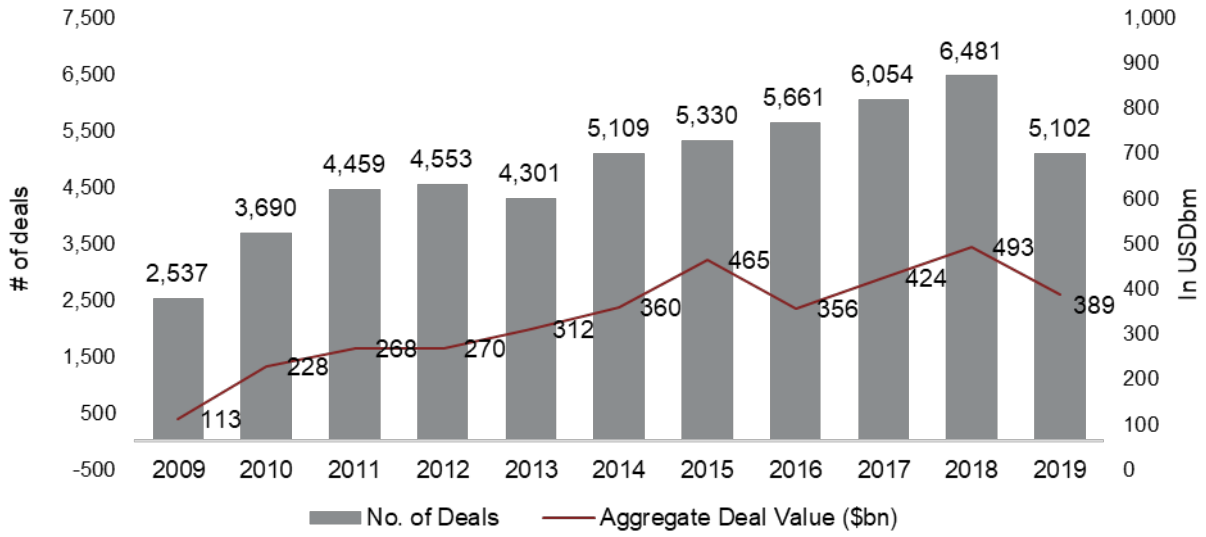


Source: Preqin (2021)

Note: No update of statistics was provided thereafter by Preqin

On the deal side, as shown in Figure 4, the number of deals has increased by a CAGR of 7.2% from 2009 to 2019, reaching 5,102 in total. The aggregated deal value has increased with a CAGR of 13.2% to USD 389bn, with an average deal size of USD 487m.

FIGURE 4: GLOBAL PE-BACKED BUYOUT DEALS, 2009–2019



Source: Preqin (2021)

Note: No update of statistics was provided thereafter by Preqin

These statistics are highly relevant in understanding private equity TRANSACTIONS. The statistics could be analyzed in greater detail, and there is additional information to explore. Relevant to this context is that the transaction market has substantially risen in average deal size. The number of TRANSACTIONS has not kept pace with the number of active investors. Additionally, GPs will most often not only be managers of a single fund but potentially of various funds, with each looking to make several investments. From these statistics, one can conclude that the private equity markets have become significantly more mature, with strong competition in particular sub-segments.

Fierce competition in TRANSACTIONS carries an associated risk of overpaying. This risk, alongside the high expectations of LPs with regard to the returns, highlights the need for GPs to have clear ACTIONS for VALUE CREATION in relation to their PORTFOLIO COMPANIES. They also require a clear view of the feasibility of ACTIONS even before

purchasing a specific company. This increasing complexity TRANSACTIONS is highlighted by Vester (2011) and Puche and Braun (2019), who emphasize that successful VALUE CREATION in private equity today requires a blend of financial market expertise, strategic insight, analytical skills, and industry operating expertise.

The activities of GPs on the deal side occur in three distinct phases: (pre-)transaction/ENTRY, HOLDING PERIOD, and EXIT. GPs have developed ACTIONS for all three phases to achieve the best possible return with a particular PORTFOLIO COMPANY (Feeney et al., 1999). Section 2.3 will elaborate in greater detail on the development of ACTIONS throughout the last decades and their recognition in the academic literature. Essentially, until the early 2000s, the ACTIONS employed by GPs revolved around asset stripping and pure holding strategies. In asset stripping, a GP would acquire a firm, dismantle it, and sell its parts or assets at a higher price to generate returns. In contrast, GPs employing pure holding strategies would acquire an asset, maintain its existing state, and rely on favorable (market) development. DELEVERAGE, which will be detailed in Section 2.8, played a fundamental role in VALUE CREATION.

It seems plausible that such ACTIONS are insufficient to both attract the interest of LPs and, as a second step, to generate returns in today's market environment. LPs need to be convinced that a GP can perform vital ACTIONS, such as strategy and product development, instead of simple financial restructuring, as noted by Cumming et al. (2007). Most often, GPs seek growth opportunities instead of cost reductions and asset stripping (Kester and Luehrman, 1995).

In fact, with the increasing professionalization of the market and vendors of target firms seeking professional advice, the previously observed knowledge disparity between one-time sellers and professional buyers has significantly declined. Private equity itself has become a commodity. In today's market environment, GPs must compete by making a compelling case for how they can contribute and support target firms in the upcoming years, rather than merely outbidding competitors. They must convince vendors and the target firm's management teams of their ACTIONS and visions. They have to potentially commit additional capital in advance, disclose industry contacts, or

demonstrate how they can support and help the firm achieve its targets (Fuchs et al., 2021).

Sensoy et al. (2014) note that the industry has evolved rapidly and that past performance is unlikely to predict future performance. For this reason, the introduction has focused extensively on current market characteristics and dynamics. Building on this understanding, the next section outlines the motivation for this dissertation. The subsequent sections clarify the valuation methods used in private equity to shed light on how GPs drive VALUE CREATION. It is essential to remember that private equity fund managers invest in equity[3]. Hence, the focus of every GP in any PORTFOLIO COMPANY is to increase its EQUITY VALUE.

2.3 MOTIVATION AND MAIN OBJECTIVE

This section outlines the research motivation. ACTIONS aimed at MULTIPLE EXPANSION, one of the three components of VALUE CREATION, constitute a largely unexplored and important area of study. The motivation for this study is rooted in the increasing importance of MULTIPLE EXPANSION in TRANSACTIONS, which is accompanied by widespread misinterpretation of GPs' socio-economic behaviors, misinterpretation of the capacity of ACTIONS to create value, and a lack of understanding of the particular aspect of VALUE CREATION on which specific ACTIONS have an effect. Finally, this study contributes to the literature by allowing us to identify the ACTIONS and competitive behaviors of GPs in a maturing industry.

Compared to other academic areas, research on private equity is still a relatively young discipline. Specific literature on the activities of GPs emerged in the early 90s with Smith (1990) being an example. The increasing success of private equity has seen a corresponding rise in the academic literature focusing on the field. Early research was primarily interested in evaluating GPs' returns and benchmarking them against indexes

[3] For structural reasons, GPs may also incorporate shareholder loans within a TRANSACTION, for instance to provide sweet equity or enable more flexible withdrawal of interest or funds if needed. However, these shareholder loans are regarded as equity-like, originate from the same funds with identical return requirements, and are not viewed differently from an equity perspective by the GP.

such as the S&P 500 to validate or disprove whether the GPs were earning alpha—that is, abnormal returns. The results were inconclusive. Kaplan and Schoar (2005) and Phalippou and Gottschalg (2009) found the performance of an average buyout to be below market development. Robinson et al. (2011), Harris et al. (2014), and Higson and Stucke (2012) instead discovered that GPs outperformed the market (after fees) and argued that their studies overturned previous conclusions. Phalippou (2014) notes that a definitive evaluation of the performance of funds is challenging due to the choice of the benchmark and lack of detailed deal-level data, complicating analysis, but Harris et al. (2014) conclude that GPs have consistently outperformed public markets despite the different selection criteria and data-gathering methods used for the various data samples.

Alongside the discussion on performance, researchers began to compare fund size with returns. The results here were similarly inconclusive due to low data availability, differing data samples of different quality, and benchmarking. Kaplan and Lerner (2010) argue that increasing the fund size makes it difficult to repeat top performance. Lopez-de-Silanes et al. (2015) add that, due to the attention ACTIONS require, more sector-specialized and focused GPs, which typically have smaller assets under management (AUM), may have an advantage. However, in light of the success of prominent globally active generalist GPs simultaneously managing various multi-billion USD funds, it seems clear that researchers lack data regarding the factors on which LPs seem to base their investment decisions. Otherwise, the consistent growth of AUM by these GPs would be difficult to rationalize.

Hand in hand with the discussion on performance emerged questions regarding how GPs generate returns, what obstacles there may be to such returns, and whether their business model is sustainable. Early studies pinpointed external debt as a return source for GP, providing a tax shield while minimizing the equity contribution required. The excessive use of debt became subject to criticism and was advanced as the cause of insolvencies of PORTFOLIO COMPANIES. Nonetheless, Lopez-de-Silanes et al. (2015) concluded that debt and DELEVERAGE were sustainable sources of VALUE CREATION.

They recognized the economies of scale in debt implementation, acknowledging that seasoned lenders often obtain more favorable financing terms.

The importance of leverage—the external debt used in a TRANSACTION—is discussed in detail in Section 2.8. Lenders such as banks are experienced participants in today's market environment. They are sensitive about the debt levels in proportion to income figures, such as EBITDA or EBIT, and to free cash flow. They analyze and evaluate due diligence reports on the target firms and make investment decisions on a case-by-case basis. The pricing of debt tends to be market-related, yet the level of experience and market know-how on the GP's side facilitates its dealings with lenders.

Following the debate on leverage, researchers have identified operational improvement taken as an ACTION by the GP to generate returns. Whereas operational improvement in early research referred to cost-cutting, particularly by reducing personnel expenses, and was the focus of criticism regarding its impact on society (Vester, 2011), subsequent studies increasingly quoted other cost positions on the profit and loss (P&L) statement, as noted by Burth and Reißig-Thust (2019). Operational improvement includes optimizing the profit margin (Feeney et al., 1999) and increased efficiency, measured by reducing other operating expenses as a percentage of sales (Ahammad and Glaister, 2013).

Lahmann et al. (2017) noted that GPs add value beyond operational improvement through a more comprehensive array of ACTIONS that differ based on development stages and buyout types. While some ACTIONS correlated with returns have clear links to financial statements and therefore to valuation, for others, the link is more obscure. For instance, one study by Bergström et al. (2007) contextualizes GPs providing their PORTFOLIO COMPANIES with access to their networks as valuable for activities ranging from headhunting to identifying business partners.

The lack of deal-level data is consistently cited as a significant obstacle to research, particularly when it comes to understanding ACTIONS implemented by GPs. Overall performance in terms of the internal rate of return (IRR) and money multiple (MOM) can be derived at the fund level. However, not being able to pinpoint the specific contributions of each TRANSACTION makes it impossible to estimate the effects and

success of specific ACTIONS when it comes to analyzing returns. This can result in an over- or underestimation of their magnitude, missed correlations, and even missed underlying causal connections.

The second major shortcoming of analyzing returns at the fund level is the missing connection to the individual financial statements, accounting principles, and, consequently, valuation. Assuming that the incentive of the GP is always to increase the EQUITY VALUE of its investments, applying a more accounting-based methodology will demystify how ACTIONS contribute to the individual components of VALUE CREATION. Therefore, Section 2.4 will outline valuation standards as performed in the private equity industry. Thereafter, Section 2.5 will explain VALUE CREATION and its three components as the basis for demonstrating change in EQUITY VALUE. This financial mathematical background will provide the basis for understanding the ACTIONS performed by GPs to generate returns and their causal links to VALUE CREATION.

This study's primary objective is to demonstrate what specific GP-initiated ACTIONS trigger MULTIPLE EXPANSION. Studies, such as Kaplan and Stromberg (2009), that already reflect a more accounting-based view distinguish between EBITDA GROWTH, DELEVERAGE, and MULTIPLE EXPANSION as drivers of VALUE CREATION in TRANSACTIONS. The literature has long established that EBITDA GROWTH, driven by sales expansion, operational enhancements, or other ACTIONS, is a source of VALUE CREATION in TRANSACTIONS. A notable example is Boucly et al. (2011). The same is true for DELEVERAGE (cash contribution used for debt repayment during the HOLDING PERIOD and thereby creating EQUITY VALUE), with Scholes et al. (1990) being a reference. In contrast, MULTIPLE EXPANSION was only recently confirmed as a constant source of returns for GPs. Its origin is, however, underexplored and contradictory in academic literature. MULTIPLE EXPANSION was first attributed to luck, then to market timing, and later to GPs' negotiation skills. Lahmann et al. (2017) refer to such contradictory research by citing Achleitner et al. (2011), Kaplan and Stromberg (2009), and Renneboog et al. (2007), all of whom name managing and timing as essential skills of successful GPs, versus Diller and Kaserer (2009) and Bergström et al. (2007), who rejected the notion that GPs' timing was critical to securing MULTIPLE EXPANSION.

The literature concerning negotiation skills is even more contradictory. Puche and Braun (2019) find evidence for MULTIPLE EXPANSION being essential for deal returns but note that practitioners often assume the EBITDA MULTIPLE at EXIT to be the same as that at ENTRY when modeling returns before ENTRY. This suggests that GPs often do not assume MULTIPLE EXPANSION when investing in a company unless there are compelling reasons to anticipate a different MULTIPLE at EXIT, such as might be assumed with BUY & BUILD. More importantly, however, the authors compare the MULTIPLE paid at ENTRY and EXIT to industry MULTIPLES, distinguish between GP ENTRY skills (for buying below market prices) and GP EXIT skills (for selling above market prices), and allocate the remainder to market development. They find that the ENTRY-to-EXIT MULTIPLE increases in almost all years, that prices at EXIT influence absolute MULTIPLE EXPANSION about 2.5x vs. at ENTRY, and that price levels at EXIT correlate with MULTIPLE EXPANSION more than price levels at ENTRY (more than fourfold).

This demonstrates that attributing MULTIPLE EXPANSION solely to negotiation skills is too limited an explanation. Since GPs frequently engage in secondary TRANSACTIONS, in which they buy from or sell to other GPs, it would be incongruous to suggest they are less skilled at negotiating during acquisition (ENTRY) than at divestment (EXIT). The presumption is that they should consistently apply their negotiation expertise at ENTRY and EXIT. Thus, there must be another factor that drives MULTIPLE EXPANSION, which reflects the potential for further research on MULTIPLE EXPANSION.

As noted by Achleitner et al. (2011), there is still a lack of research examining the mechanisms of VALUE CREATION, even if there are some notable exceptions. According to Lahmann et al. (2017), VALUE CREATION in private equity is a complex model and interdependencies between various layers must be considered. The author's framework will make it visible that specific ACTIONS repeatedly applied by GPs are exclusively aimed at generating MULTIPLE EXPANSION. This study will contribute to the literature by advancing our understanding of VALUE CREATION in accounting terms, hereby specifically attributing the ACTIONS' impact on the financial statements (income statement [P&L], cash flow statement, or balance sheet), and particularly the relevance and components of MULTIPLE EXPANSION.

2.4 MULTIPLE-BASED VALUATION AND CALCULATION OF VALUE CREATION

This section explains MULTIPLE-BASED VALUATION as a foundation for understanding VALUE CREATION. It consists of three components: EBITDA GROWTH, DELEVERAGE, and MULTIPLE EXPANSION. With this, the chapter establishes the foundation for the hypotheses, claiming that specific ACTIONS initiated by GPs aim at generating MULTIPLE EXPANSION in TRANSACTIONS.

In most M&A transactions, particularly in the private equity landscape, a firm's pricing will involve MULTIPLE-BASED VALUATION. This is reflected by Plenborg and Pimentel (2016), and an earlier study by Lie and Lie (2002), both of which state that market participants abandon comprehensive valuation models in favor of MULTIPLE-BASED VALUATION. Consequently, upon ENTRY and EXIT, a GP will typically determine a firm's ENTERPRISE VALUE using MULTIPLE-BASED VALUATION. In addition, GPs are usually governed by a combination of legal or regulatory provisions and contractual terms with the LPs. GPs are typically required to report the EQUITY VALUE of the individual PARTICIPATIONS to the LPs on a quarterly basis. In this regard, funds follow the International Private Equity and Venture Capital (IPEV) valuation guidelines, which are intended to represent current best practices on the valuation of private capital investments, including privately held (i.e., unlisted) investments in early-stage ventures; management buyouts; management buy-ins; infrastructure, credit, and similar investments; and investments in funds making such investments (IPEV, 2018). The valuation guidelines follow the principle that fair value measurements derived when using these guidelines comply with the International Financial Reporting Standards (IFRS) and United States Generally Accepted Accounting Principles (US GAAP). Apart from consistency with accounting principles, GPs must report fair values for their PARTICIPATIONS in their financial statements, which are increasingly monitored by international financial authorities.

The valuation guidelines focus on articulating valuation best practices from a conceptual, practical, and investor reporting standpoint. Here, fair value is understood as the price that would be received selling an asset in an orderly (but hypothetical) TRANSACTION between market participants at the measurement date.

The acceptance of MULTIPLE-BASED VALUATION by IPEV confirms its validity and importance for private equity transactions. In the literature, Vydrzel and Soukupová (2012), among others, have similarly confirmed that MULTIPLE-BASED VALUATION has established itself as the private equity industry's standard valuation methodology and has become an integral part of the reporting standards.

MULTIPLE-BASED VALUATION is a handy and straightforward yet accurate approach for determining the total value of a firm—commonly referred to as the ENTERPRISE VALUE. The ENTERPRISE VALUE equals also always the sum of a firm's EQUITY VALUE and NET DEBT (or NET CASH, if cash and cash-like items exceed debt and debt-like items). In most cases, the basis for calculating the ENTERPRISE VALUE is the EBITDA[4], the common term for earnings before interest, taxes, depreciation, and amortization. The EBITDA is used as it reflects the operating performance/profitability (which, e.g., sales does not), while it excludes non-cash and non-operating positions in the P&L.

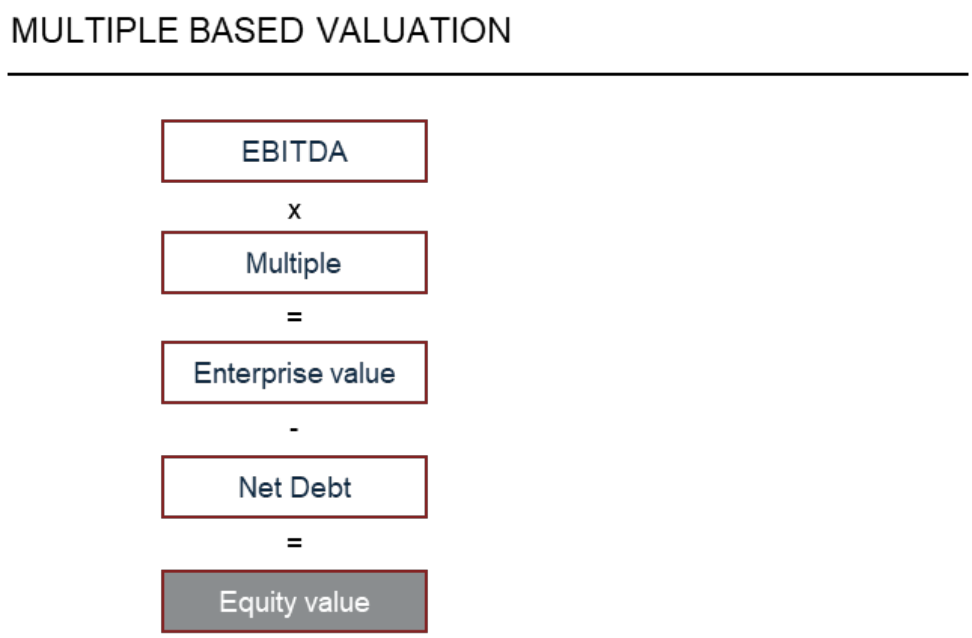
More precisely, the reason buyers do not multiply net income instead is relatively simple. Buyers disregard the current financing structure of firms and consequentially the interest income and expenses as they buy firms on a cash- and debt-free basis. As explained below, the purchase price is derived at the level of ENTERPRISE VALUE. Any debt will be repaid to the existing lenders during the TRANSACTION, and the remainder—the EQUITY VALUE—will be paid to the vendor(s). After the TRANSACTION, a firm will usually have a new financing structure. With this change in its financing structure comes a change in tax payments, which means the taxes are neither of interest nor important for valuation. Therefore, both EBIT and EBITDA are excellent proxies for companies' financial earning power. EBITDA can be derived downwards from sales and upwards from net income. It is noteworthy that EBITDA can be used as a shortcut to estimate a firm's free cash flow, which can be used to forecast its financial gearing capacity—that is, how much leverage can (theoretically) be used to finance the TRANSACTION. Therefore, in private equity TRANSACTIONS, the most common measure

[4] In some cases, buyers will instead, or in addition, evaluate EBIT, particularly for companies that incur high capital expenditures (CAPEX). However, a company's asset heaviness (the requirement for CAPEX and consequentially high depreciation) is usually industry-specific and therefore reflected in the EBITDA MULTIPLE applied.

used to calculate a corporation's ENTERPRISE VALUE is EBITDA times the relevant EBITDA MULTIPLE, with a premium or discount to reflect the characteristics of the individual target company. Investors focusing on start-ups or restructuring might be evaluating other P&L and cash-flow-based figures. Likewise, specific industries may require investors to consider other P&L figures. EBITDA is highly relevant as both price and leverage are often cited in terms of the EBITDA MULTIPLE, as noted by Bergström et al. (2007). In addition, EBITDA is a proxy for operating cash flow and serves as an industry convention that provides a measure of enterprise performance insulated from differing global accounting standards and capital structures (Zeisberger et al., 2016).

In MULTIPLE-BASED VALUATION, as displayed in Figure 5, the ENTERPRISE VALUE is calculated as the product of EBITDA and a market EBITDA MULTIPLE corresponding to the firm's activity, sector, and industry. EBITDA, whether based on the last financial year, LTM, or the next fiscal year's forecast, is typically adjusted to account for one-time effects, such as extraordinary income or expenses (e.g., advisory costs, legal fees), non-operational or non-core items (e.g., gains or losses from asset sales, FX), excessive owner compensation, and irregular income or expenses.

FIGURE 5: MULTIPLE-BASED VALUATION



Source: Own figure/analysis

As previously noted, the applied MULTIPLE combines a market MULTIPLES with individual premiums or discounts. Typically, these market MULTIPLES are derived using listed company peers (with a standard market discount for illiquidity, typically 20%–25%, according to the valuation guidelines of the Big Four global accounting firms) on the one hand and MULTIPLES taken from comparable TRANSACTIONS on the other. The process is extensively discussed in the literature (see, e.g., Bhojraj and Charles, 2002, for an overview).

The actual EBITDA MULTIPLE for a given firm includes a premium or discount depending on the asset's attractiveness. For comparable TRANSACTIONS, market participants typically choose recent TRANSACTIONS, with a maximum timeframe of 3–5 years. Therefore, the MULTIPLES of comparable TRANSACTIONS follow the industry trend over the given period, while the MULTIPLES of listed peers always reflect the on-the-spot market sentiment and express the prevailing economic climate and cycle.

Importantly, peer groups for both listed peers and comparable TRANSACTIONS incur a certain arbitrariness and selection bias. In the marketing documents of M&A advisors or information shared during negotiations with counterparties to undermine a certain valuation, there may be an interest to select higher- or lower-traded peers or TRANSACTIONS, as noted by Eaton et al. (2021). In addition, the EBITDA MULTIPLES of listed peers can be somewhat distorted; whenever drastic economic changes—such as those caused by the COVID-19 pandemic—lead to sharp declines in profitability (i.e., EBITDA), firms' market valuations do not correct evenly. In such cases, MULTIPLES can rise sharply.

Several counterarguments can be made against the notion that deriving MULTIPLES does not reflect the overall market but relies on the interpretation of the individual parties. Particularly during TRANSACTIONS, the process involves the input of multiple parties on both the seller's and the buyer's side, each contributing their expertise and professional insights, and each with access to professional databases and other professional sources. With this, the process can be described as a triangulation between various stakeholders.

Ahead of an auction, the M&A boutique or investment bank serving as the seller's advisor may conduct a market-sounding exercise, seeking indications of MULTIPLES from select potential buyers. Moreover, these advisors typically have industry-specific teams continuously monitoring MULTIPLES within their sectors. Such teams proactively approach potential sellers when they identify favorable conditions, such as elevated MULTIPLES, suggesting an opportune moment for a sale.

Potential buyers similarly rely on their professional sources, industry expertise, and sometimes external advisors to derive MULTIPLES. In addition, buyers, particularly GPs, approach several banks to secure acquisition financing. Hereby, they discuss and justify MULTIPLES, ENTERPRISE VALUES, and consequently, the amount of debt and equity for TRANSACTIONS. The banks, in turn, provide feedback on the viability of the MULTIPLES and their willingness to finance portions of the purchase price.

This collective input results in a situation where often a group of bidders in a TRANSACTION arrives at similar ENTERPRISE VALUES, with only a few outliers. This highlights the point raised in Section 2.2 that GPs must differentiate themselves beyond simply offering a competitive purchase price to succeed in auctions.

Also note in this context that during all three phases—at ENTRY, during the HOLDING PERIOD, and at EXIT—the GP has to be able to justify to its LPs whether a particular MULTIPLE is appropriate. The LPs themselves are likewise monitoring MULTIPLES and, through their investments in various funds, have an even clearer picture of MULTIPLES. Particularly on ENTRY, with the associated risk of overpaying alongside the pressure to invest, but also throughout the HOLDING PERIOD, LPs are attentive to the MULTIPLE-BASED VALUATION of GPs. LPs track the last MULTIPLE applied to a PORTFOLIO COMPANY in the HOLDING PERIOD versus the MULTIPLE realized at EXIT. Besides their general expectations of returns, LPs do not like substantial deviation between valuations they receive as part of the GP's reporting versus valuations realized at EXIT, particularly if such deviation is negative. Again, this becomes highly relevant upon a GP's subsequent fundraising and the ensuing intensive exchange with LPs.

Moreover, the EBITDA MULTIPLES utilized in this study are neither simulated nor contrived. They simply mathematically reflect the agreement reached between

seasoned market participants at both ENTRY and EXIT. While factors such as one party's informational advantage, experience, or negotiation skills may be raised as criticisms or influences, the methodology employed provides two data points for each TRANSACTION—ENTRY and EXIT—involving at least three parties: the initial seller, the GP acting as buyer and seller, and the ultimate buyer. With each additional TRANSACTION in the data set, the individual evaluation of MULTIPLES becomes increasingly irrelevant.

An academic foundation for this approach is established by studies advocating the use of transaction points or transaction data in the analysis of stocks and other financial instruments. Initially, there is no direct tie between the market agreement on the trading price of a listed company and the purchase price of a privately held company. The arguments given in the academic literature in favor of the objectivity of stock prices, however, equally apply to MULTIPLES paid in the TRANSACTIONS. One such reference is the Efficient Market Hypothesis by Fama (1970), which asserts that all available information is reflected in the current price of a stock. Therefore, transaction data can be viewed as an objective measure of a stock's value, as it reflects the collective behavior of market participants. Several studies, such as Hasbrouck and Saar (2013) have explored the use of transaction data in analyzing stock prices and market movements, highlighting the objectivity and accuracy of such data. In the dataset used, this is unequivocally present, rejecting the argument of subjectivity.

The EQUITY VALUE is derived by adding NET CASH or deducting NET DEBT (see, e.g., the Corporate Finance Institute, 2022) to the ENTERPRISE VALUE. As the amount of financial debt often exceeds the cash position, typically one speaks of NET DEBT in this context. NET CASH/NET DEBT is derived from the balance sheet but may include off-balance-sheet liabilities, such as leasing. Positive values are derived from the assets side, and negative values are derived from the liabilities side. The most basic NET DEBT calculation includes assets such as cash and cash equivalents (also known as cash-like items), such as marketable securities, as positive values. On the liabilities side, typical deductibles are short- and long-term debt, such as revolving credit facilities, bank debt, or mezzanine capital.

When it comes to an actual TRANSACTION, buyers and sellers will aim to include additional positions in the NET DEBT calculation—comparable to EBITDA adjustments accounting for one-off and/or extraordinary income or expenses. Beyond evident deductibles, purchasers may want to subtract debt-like items, such as pension liabilities, tax liabilities, guarantees, or accrued expenses. Certain cash amounts might be considered operative—that is, necessary for day-to-day business activities and not suitable for distribution (and therefore not be included in the calculation). Typically, the intra-year net working capital (NWC) development is also considered, again to adjust for the precise amount of NWC at the point of TRANSACTION.

Put simply, the NWC is the sum of inventories and trade receivables minus trade payables, but can also account for other positions, such as prepayments. To understand its importance for NET DEBT—in fact, its relevance for cash—one might visualize a seller being tempted to sell a company with lower-than-usual stock levels or unpaid invoices at the point of TRANSACTION. Equally, a company might incur a high level of seasonality, and the NWC at the selected date of a TRANSACTION may not be reflective of the required (average) NWC throughout the year, in which case the buyer or seller would want to adjust this as part of the NET DEBT.

What remains after deducting the NET CASH/NET DEBT items is the EQUITY VALUE. Again, the aim of any GP with any PORTFOLIO COMPANY is to increase the EQUITY VALUE between ENTRY and EXIT throughout the HOLDING PERIOD. A GP typically targets a return above 25% internal rate of return (IRR) and a MOM above 2.5x.

To clarify, the IRR is a metric in financial assessment that gauges the potential profitability of investments (for the purpose of this study, the interest is on returns from PARTICIPATIONS in PORTFOLIO COMPANIES; however, as both IRR and MOM can be applied in other instances, the description of the KPIs is provided for investments in general). IRR is essentially the discount rate at which the net present value (NPV) of cash flows reaches zero in discounted cash flow analysis. Thus, the IRR does not represent an investment's actual cash return but rather its annual return as a percentage.

A higher IRR indicates a more enticing investment opportunity. Its standardized format and expression as a percentage enable straightforward comparisons of investment opportunities. In GP-led TRANSACTIONS, the IRR is particularly significant when compared to the HURDLE RATE (described in Section 2.1) that a GP must achieve in order to qualify for carried interest payments. The formula for calculating IRR is as follows:

$$0 = \text{NPV} = \sum_{t=1}^{T} \frac{C_t}{(1+IRR)^t} - C_0$$

- where:
- C_t = Net Cash inflow during the period *t*
- C_0 = Total initial investment costs
- *IRR* = The internal rate of return
- *T* = The number of time periods

Patrick and French (2016), among others, discuss the use of IRR as a key performance measure for investments. They highlight its simplicity as an appealing benchmark but also point out its limitations, especially when used in isolation for evaluating investment opportunities or returns achieved. One such limitation is that the IRR does not express the total cash return of an investment, which can be—despite a very high IRR—insignificant, at least for the purposes of a GP. This is the case, for example, if an investment is sold within a very short time. Consider an investment of EUR 1m on January 1 in a given year that is sold on December 31 of the same year for EUR 1.5m. The IRR of such an investment would be 50%. The VALUE CREATION would amount to EUR 500k. To contextualize IRR in relation to capital invested, market participants use a second figure to supplement the information provided by the IRR: MOM.

The MOM is the ratio between the total cash inflows received throughout the HOLDING PERIOD and at EXIT, and the total cash outflows the GP has made at ENTRY and throughout the HOLDING PERIOD. MOM thus evaluates the return on an investment

relative to the initial capital investment. In private equity, assessing the effectiveness of capital utilization is key for both GPs and LPs. MoM offers clarity and is vital for benchmarking across investments, funds, and sectors. Its straightforward nature means that MoM is an easily understood metric for investors. This simplifies communication on investment value and performance, aiding decision-making. In private equity, MoMs are crucial. They facilitate performance evaluation and clear communication, aligning the interests of fund managers and investors. A number of researchers have confirmed the relevance of MoM (see, e.g., Buchner and Wagner, 2013).

Being the result of a simple division, MoM does not take account of time or the time value of money. Hence, if applied in isolation, the comparison with other investment opportunities or returns is limited, as opportunity costs cannot be evaluated. For this reason, MoM, like IRR, is unsuitable as a single metric for evaluating investment opportunities and returns. However, when used together, MoM and IRR complement each other's deficiencies and are commonly utilized among market participants for evaluating investment opportunities as well as expressing returns to other market participants and LPs.

Both measures are typically calculated at the level of a single shareholder (or a single GP) for a particular Participation, and not at the Portfolio Company level for 100% Equity Value. At the individual shareholder level, MoM and IRR can diverge for the same investment in a Portfolio Company. This may occur when shareholders participate in different ways upon Entry, such as through incentivized equity options (sweet equity), when shareholders exit during the Holding Period, or when they provide varying levels of additional capital throughout the Holding Period.

Therefore, IRR and MoM contrast with the (total) Value Creation used in this study (explained in Section 2.5), which ultimately captures the total cash difference in Equity Value between Entry and Exit at the company level. Hereby, and in contrast to IRR and MoM, any additional capital injections (follow-on financing) or withdrawals (such as dividends or interest payments on shareholder loans) are not explicitly or individually

reflected in the VALUE CREATION but are indirectly captured through the change in NET DEBT/NET CASH.

Both IRR and MOM are repeatedly communicated to LPs both on the PORTFOLIO COMPANY level and at the fund level. Both figures are often reported as both gross and net of transaction costs, advisory fees, management fees, and other expenses.

Finally, it is important to visualize that both the EBITDA and EBITDA MULTIPLE are multipliers, whereas NET CASH or NET DEBT are only added or subtracted, respectively. Hence, changes in EBITDA or the EBITDA MULTIPLE have a much more significant impact on the EQUITY VALUE than a change in NET CASH/NET DEBT and are therefore more impactful for VALUE CREATION.

2.5 CALCULATION OF VALUE CREATION

Kaplan and Stromberg (2009) developed a model distinguishing the following three sources of VALUE CREATION to explain the returns achieved by GPs: change in operating performance (EBITDA GROWTH), change in EBITDA MULTIPLES, and change in leverage (DELEVERAGE). LPs and GPs analyze gains or losses from individual TRANSACTIONS in the same way. The calculation follows MULTIPLE-BASED VALUATION. In comparison to other academic literature—which, as demonstrated earlier, often considers value creation as a broad range of initiatives and methods that can eventually be attributed to positive returns—practitioners in private equity refer to VALUE CREATION as the total delta in EQUITY VALUE (for the avoidance of doubt) in cash realized with a PORTFOLIO COMPANY between ENTRY and EXIT.

VALUE CREATION[5], displayed in Figure 6, is determined such that any increase or decrease in EQUITY VALUE between the ENTRY and EXIT can be mathematically attributed to three sources: EBITDA GROWTH, MULTIPLE EXPANSION, and DELEVERAGE. The three components of VALUE CREATION are derived as follows: EBITDA GROWTH[6] is calculated as the change in EBITDA (Δ EBITDA) multiplied by the ENTRY MULTIPLE. MULTIPLE EXPANSION[7] is determined by the change in EBITDA MULTIPLE (Δ EBITDA MULTIPLE) multiplied by the EXIT EBITDA. DELEVERAGE[8] is represented by the change in NET CASH/NET DEBT (Δ NET CASH/NET DEBT). The sum of EBITDA GROWTH, MULTIPLE EXPANSION, and DELEVERAGE equals the total VALUE CREATION for a given PORTFOLIO COMPANY.

The primary goal of any GP is typically to enhance the EQUITY VALUE of its PARTICIPATIONS. Therefore, VALUE CREATION for practitioners neither covers stakeholder value nor value before or after the HOLDING PERIOD; it simply expresses the increase in the EQUITY VALUE of a PORTFOLIO COMPANY at EXIT compared to that at

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[5] The private equity terminology assumes positive development and VALUE CREATION. However, all three components can develop negatively, resulting in a loss of value.

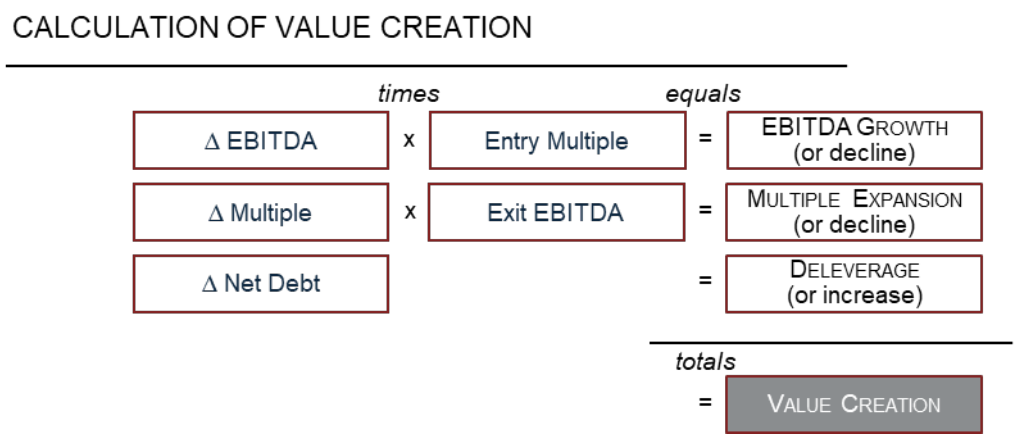
[6] As the calculation is based on the EBITDA, it is irrelevant whether the Δ results from sales growth or higher profitability of the PORTFOLIO COMPANY between these two time points. The Δ in EBITDA is multiplied by MULTIPLE at ENTRY, which is a given number equating to the quotient of ENTERPRISE VALUE and the utilized EBITDA. Consequently, EBITDA GROWTH is derived, reflecting the value generated by the growth of EBITDA between ENTRY and EXIT.

[7] By using Δ in EBITDA MULTIPLE and the EBITDA at the EXIT, in comparison to EBITDA GROWTH, this part of the calculation only accounts for the cash contribution through MULTIPLE EXPANSION.

[8] It is commonly referred to as DELEVERAGE because TRANSACTIONS are usually financed by (external) lenders and this debt is reduced during the HOLDING PERIOD. Consequently, the PORTFOLIO COMPANY'S cash generation throughout the HOLDING PERIOD is used to decrease NET DEBT (perhaps even reaching a NET CASH position), increasing the EQUITY VALUE. Again, in unsuccessful instances, the opposite may occur.

ENTRY. Hence, the calculation displayed in Figure 6 captures the three possible sources of EQUITY VALUE increase between ENTRY and EXIT.

FIGURE 6: CALCULATION OF VALUE CREATION



Own figure/analysis; adapted and modified from Zeisberger et al. (2016)

Where:

- Δ in EBITDA refers to the difference between the EBITDA used for valuation in the TRANSACTION at ENTRY and the EBITDA used for valuation in the TRANSACTION at EXIT in relation to a specific PARTICIPATION.
- Δ in NET DEBT/NET CASH expresses the VALUE CREATION generated by the cash generation between ENTRY and EXIT.
- Δ in EBITDA MULTIPLE times EBITDA at EXIT equals MULTIPLE EXPANSION.

The sum of EBITDA GROWTH, DELEVERAGE, and MULTIPLE EXPANSION always equals the VALUE CREATION and consequently the total increase (or decrease) in EQUITY VALUE gained (or lost) with any given PORTFOLIO COMPANY.

It is important to note that, in the aforementioned calculation, it is unlikely for any of the three values to amount to zero throughout the HOLDING PERIOD. Even a PORTFOLIO COMPANY with a stagnating EBITDA level would generate or lose cash in due course and therefore be in a different NET DEBT/NET CASH position at EXIT. Moreover, it is virtually impossible for the Δ MULTIPLE to be zero, as the EBITDA MULTIPLE is unlikely

to remain exactly the same between ENTRY and EXIT. This is because it is influenced by comparable peers, TRANSACTIONS, and the individual growth prospects of the firm.

In the unlikely event that a PORTFOLIO COMPANY were to be sold for the same ENTERPRISE VALUE or the same EQUITY VALUE, it is practically impossible for the other respective value (ENTERPRISE VALUE or EQUITY VALUE) to remain identical. Even in the case of zero VALUE CREATION, where the EQUITY VALUE remains at its initial level, the inevitable ongoing cash contribution of a PORTFOLIO COMPANY with subsequent changes in NET DEBT/NET CASH would need to be offset. Consequentially, one of the other components of VALUE CREATION (EBITDA GROWTH or MULTIPLE EXPANSION) would have to, positively or negatively, equalize the same monetary amount. Thus, even in a scenario of zero VALUE CREATION, the individual components of VALUE CREATION cannot be zero; there would always be movement within these components. However, making the scenario even more improbable, such a PORTFOLIO COMPANY would undoubtedly be evaluated (for such non-performance) with a lower EBITDA MULTIPLE than the GP did at the ENTRY.

Therefore, it is practically impossible for any of the components of VALUE CREATION to remain at zero. Returning to MULTIPLE EXPANSION and its representation in the academic literature, it is surprising and noteworthy that MULTIPLE EXPANSION has only in recent years come to the attention of researchers examining private equity returns (e.g., Puche et al., 2016) and VALUE CREATION, despite being an inherent value-altering factor in every individual TRANSACTION.

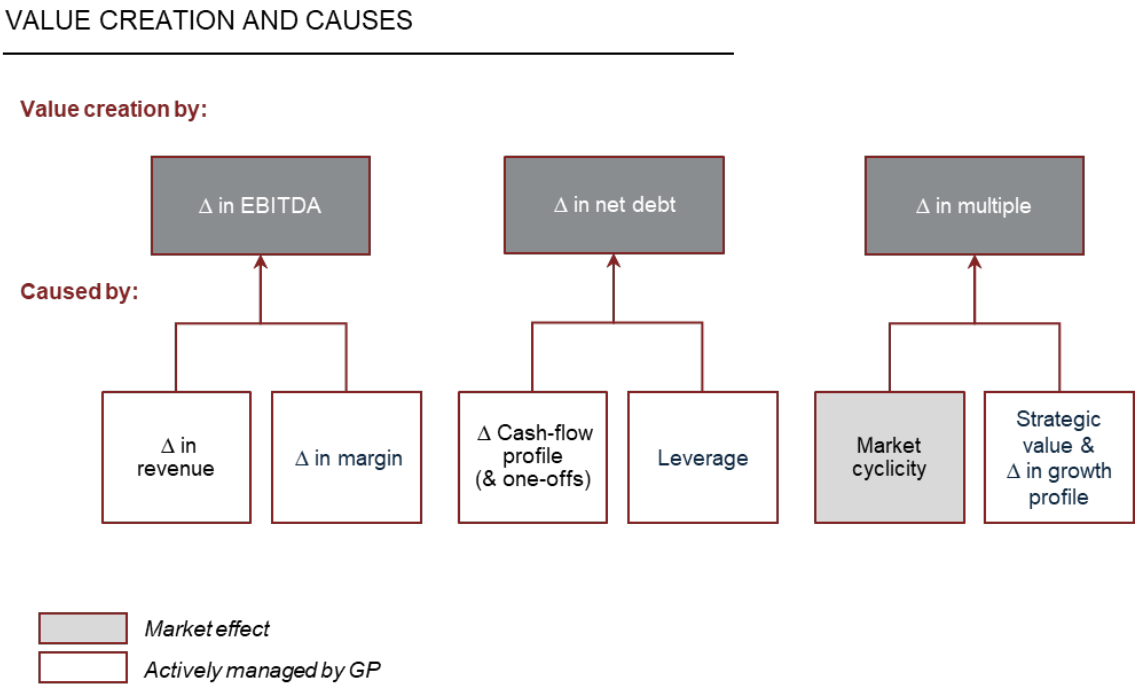
Having established that all three components of VALUE CREATION change throughout a HOLDING PERIOD with any given PORTFOLIO COMPANY, does it not make sense for a GP striving for VALUE CREATION to approach all three of them? VALUE CREATION models used by practitioners and some academic publications (e.g., Pindur, 2007; Loos, 2006) differentiate between EBITDA GROWTH, MULTIPLE EXPANSION, and DELEVERAGE. As the calculation of VALUE CREATION is evident, would it not be interesting, as Vester (2011) states, to link the change in value to ACTIONS during the HOLDING PERIOD to find out what worked and what did not? What if the results could be reliably related to generating MULTIPLE EXPANSION? This is the starting point of the next chapter.

2.6 CAUSES AND TRIGGERS OF Δ IN EBITDA, Δ IN NET DEBT, AND Δ IN MULTIPLE

As explained in detail in the previous chapter, VALUE CREATION is the sum of EBITDA GROWTH, DELEVERAGE, and MULTIPLE EXPANSION, which individually result from Δ in EBITDA, Δ in NET DEBT, and Δ in MULTIPLE. Before delving into theory and hypotheses and focusing on MULTIPLE EXPANSION, this chapter will elucidate, from an accounting perspective, the factors that influence changes in each of the three figures and the ACTIONS underlying such changes. In this context, the ACTIONS identified in the academic literature are mapped to the corresponding component. Particularly for understanding EBITDA GROWTH and DELEVERAGE, it is important to visualize the P&L, cash-flow statement, and balance sheet. Inevitably, below EBITDA P&L figures are irrelevant in contributing to EBITDA GROWTH. Instead, these positions are incorporated through the cash-flow statement in the cash contribution of a PORTFOLIO COMPANY and are, therefore, accounted for via DELEVERAGE into VALUE CREATION.

Building on the VALUE CREATION calculation, Figure 7 identifies and attributes specific causes to the three components of VALUE CREATION.

FIGURE 7: VALUE CREATION AND CAUSES



Source: Own figure/analysis

Where:

- Any Δ in EBITDA can only occur as the outcome of Δ in revenue[9] (also referred to as change in top-line) and/or Δ in Margin (or change in bottom-line). Therefore, Δ in EBITDA captures any increase or decrease of revenues in addition to any change in a firm's profitability—both due to any activity a firm has initiated or any change in business. In terms of accounting, Δ in EBITDA is clearly linked to a firm's operating performance and rooted in its profit & loss statement, as explained in Section 2.4.
- Any Δ in NET DEBT/NET CASH occurs due to a Δ in the cash-flow profile of a PORTFOLIO COMPANY and/or the use of leverage—that is, the debt load provided by external creditors (e.g., banks, debt funds, or other financial institutions). Whereas Δ in EBITDA relates to the P&L statement, Δ in NET DEBT/NET CASH relates to the cash flow statement of a PORTFOLIO COMPANY. The operating cash flow is derived from EBITDA. Any Δ in cash-flow profile (including one-offs), however, reflects the impact of ACTIONS that either permanently affect the ability of a PORTFOLIO COMPANY to generate cash or result in one-time cash events. The second part relates to leverage, which includes everything associated with debt repayment.
- Δ in MULTIPLE is caused by market cyclicity but also due to changes in a PORTFOLIO COMPANY'S strategic value & Δ in growth profile, which will be explained in detail in due course and which is to be tested in this study.

Having defined how Δ in EBITDA, Δ in EBITDA MULTIPLE, and Δ in NET DEBT are caused, the question is how these causes are influenced and triggered by ACTIONS. Not all triggers and causes are in the hands of the GP (or management); some are

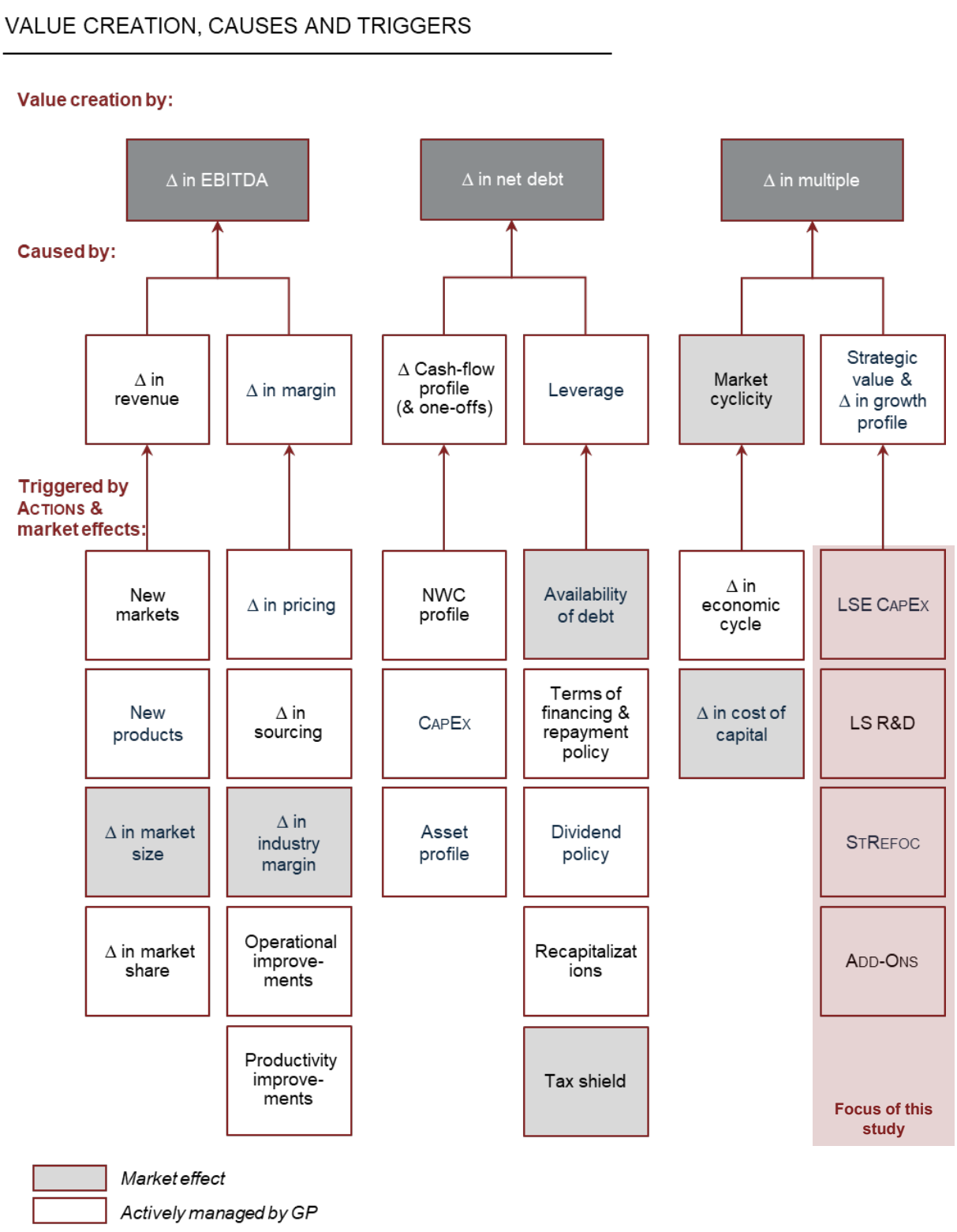
[9] From an accounting perspective, and for completeness, it would be more accurate to refer to Δ in total output instead. However, significant year-on-year deviations in changes in inventories/work in progress (WIP) typically occur in companies with project-based operations, high individual volumes, and/or long completion times. The buildup and reduction of such changes in inventories/WIP are therefore not pursued by ACTIONS aimed at EBITDA GROWTH as part of VALUE CREATION but are instead inherent to the business activities of the firm. Furthermore, unlike inventory in the balance sheet, which forms part of NWC and may represent a continuous buildup due to growing business activities, these changes usually fluctuate based on sales realization, meaning a high buildup is typically followed by a reduction in the following year.

market-driven (i.e., market effects). However, this study focuses on how ACTIONS (whether in the form of strategies, measures, or initiatives) performed by GPs lead to a change in value in one of the three components of VALUE CREATION.

This research aims to demonstrate that GPs consistently execute targeted ACTIONS to create value through MULTIPLE EXPANSION. Following the exclusion principle, certain ACTIONS can be attributed to MULTIPLE EXPANSION, as they exhibit no or minimal positive influence on EBITDA GROWTH and DELEVERAGE, or could even have a directly adverse impact. As GPs aim to create value, it is unlikely that they would repeatedly engage in such ACTIONS. Consequently, these ACTIONS must be linked to, and aimed at securing, MULTIPLE EXPANSION. This study's aim is not to attribute the pursuit of MULTIPLE EXPANSION solely based on exclusion—that is, that an ACTION must be directed at MULTIPLE EXPANSION because it fails to positively impact, or may even detrimentally affect, the other two metrics Δ in EBITDA and Δ in NET DEBT. Instead, the research is aimed at delineating a (non-exhaustive) collection of ACTIONS that are unequivocally directed toward realizing MULTIPLE EXPANSION. This is particularly pertinent when the fruits of an ACTION may only manifest in the long term, well beyond the HOLDING PERIOD of a GP's involvement.

Figure 8 aims to capture key aspects relevant to the study, although it does not claim to be exhaustive. The study thoroughly explains all the ACTIONS listed. While some ACTIONS may represent overarching strategic fields, the study's objective is precisely to illustrate their effect on VALUE CREATION without an in-depth exploration of the strategies themselves. The primary focus of the quantitative analysis is to evaluate ACTIONS that contribute to creating MULTIPLE EXPANSION.

FIGURE 8: VALUE CREATION, CAUSES AND TRIGGERS

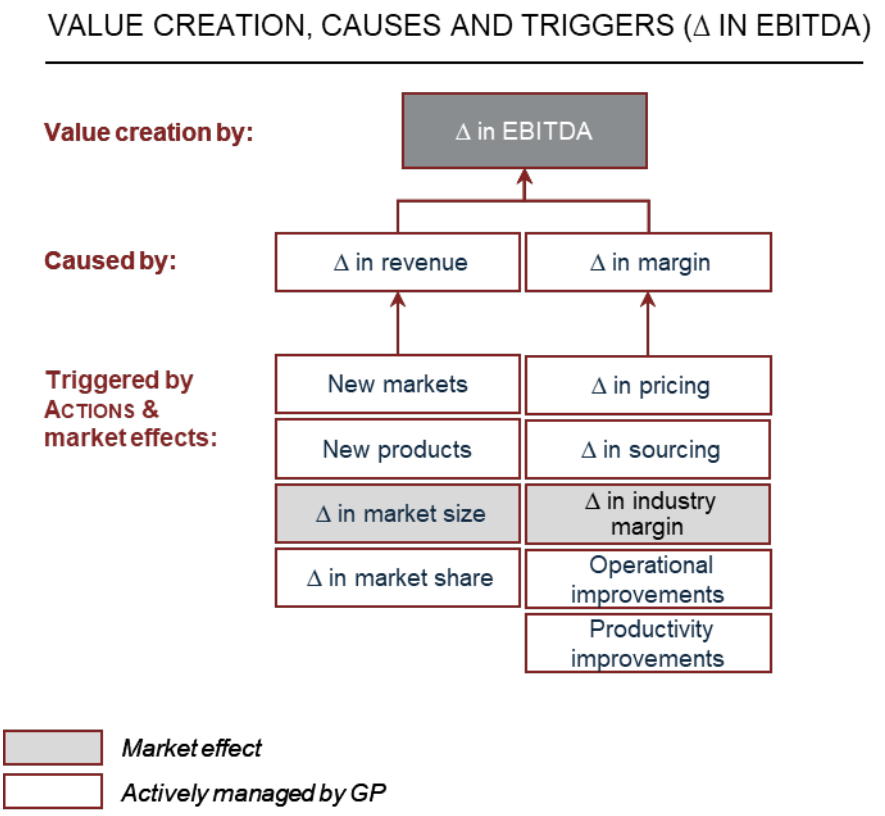


Source: Own figure/analysis

2.7 Δ IN EBITDA

Burth and Reißig-Thust (2019) and Acharya et al. (2013) state that EBITDA is a crucial criterion for evaluating acquisition targets. In essence, EBITDA GROWTH also represents the most intrinsic way to enhance a PORTFOLIO COMPANY'S value. As displayed in Figure 9, Δ in EBITDA is caused by Δ in revenue and/or Δ in margin.

FIGURE 9: Δ IN EBITDA



Source: Own figure/analysis

Top-line growth, as it is known among industry professionals, refers to augmenting a firm's revenues. Boucly et al. (2011), among others, also refer to revenue as one of the key post-acquisition drivers of VALUE CREATION. Throughout history, strategies have been devised to boost sales. ACTIONS undertaken by GPs, in tandem with a PORTFOLIO COMPANY'S management, span a range of such strategies, from venturing into new markets and innovating new products to bolstering sales teams, expanding distribution channels, and enticing customers.

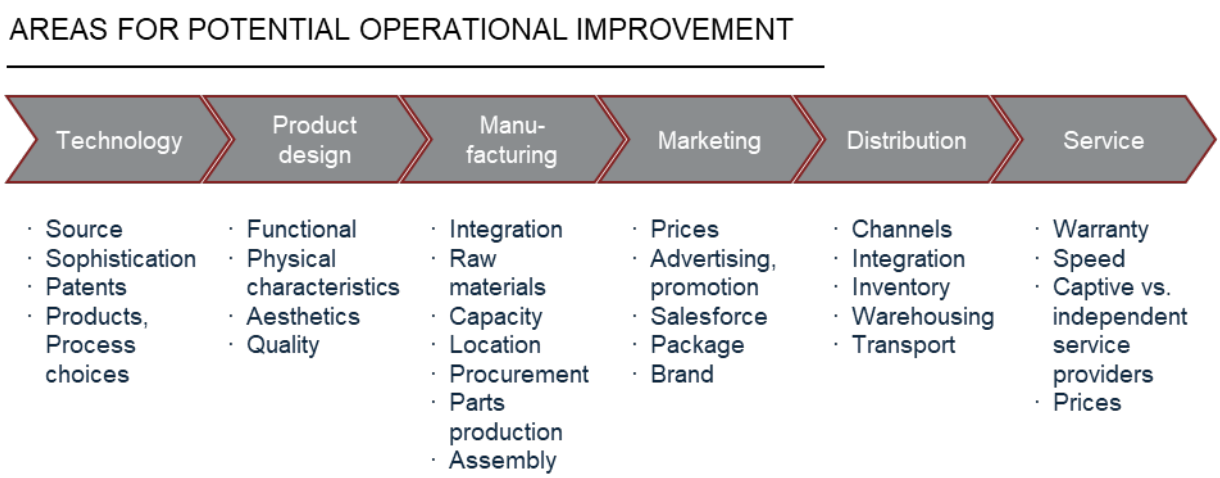
Introducing new products or modifying an existing product lineup encompasses a wide range of ACTIONS, all widely documented in management literature, with the shared goal of amplifying revenues (e.g., Burth and Reißig-Thust, 2019; Lahmann et al., 2017; Bergström et al., 2007). These are also central to the strategic considerations of GPs in collaboration with management. Classical triggers involve focusing on increasing market share (due to distinct reasons) in a particular market. Not under the GP's control is Δ in market size—that is, market growth or decline. GPs will, however, evaluate market size and growth during due diligence. While GPs may naturally gravitate towards investing in expanding markets, market dynamics may shift in unforeseen ways, influencing revenues.

Alternatively, Δ in EBITDA is caused by Δ in margin, that is, a change in a PORTFOLIO COMPANY'S profitability. ACTIONS involve Δ in pricing (potentially along with a Δ in industry margin) and Δ in sourcing to increase the gross margin. Productivity and operational improvements can lower personnel expenses per unit sold and lower other operating expenses, increasing margin. An increase in other operating income also leads to a rise in the EBITDA. Since other operating income is, by nature, irregular and arises from activities beyond regular business operations, it is generally less relevant in this context. However, exceptions exist in cases that involve holding structures and subsidiaries, where other operating income may serve as a consistent and steady source of revenue. Therefore, investors do not particularly aim to increase other operating income in this context.

According to Lahmann et al. (2017), operational improvements are common ACTIONS in all buyouts. Burth and Reißig-Thust (2019) note that operational changes result in higher EBITDAs, positively affecting returns. EBITDA GROWTH in private equity TRANSACTIONS is a source of VALUE CREATION, caused both by revenue growth and EBITDA margin improvements (see, e.g., Brigl et al., 2008; Pindur, 2007). As explained earlier, the distinction is irrelevant for the sake of Δ in EBITDA in VALUE CREATION. GPs and LPs are interested simply in calculating the contribution of Δ in EBITDA in the VALUE CREATION of a particular TRANSACTION, not in its composition.

Matthews et al. (2009) provides an overview of potential operational improvements initiated by GPs, depicted in Figure 10.

FIGURE 10: AREAS FOR OPERATIONAL IMPROVEMENT



Source: Matthews et al. (2009)

The literature has substantiated that GPs effectively enhance the profitability of their PORTFOLIO COMPANIES. For Kaplan (1989), EBITDA/sales increased by 10% to 20% in absolute value and relative to the industry alongside significant increases in VALUE CREATION. Increased profitability is also supported by Smith (1990), Kaplan and Stromberg (2009) and Lichtenberg and Siegel (1989), all of whom discovered productivity increases.

A study by Vester (2011) using an extensive database compiled by Ernst & Young revealed that half of the North American total VALUE CREATION in PE deals was due to strategic and operational improvements. More than half was due to EBITDA GROWTH within this bucket, of which three quarters was top-line growth and one quarter bottom-line savings. Their study finds EBITDA GROWTH to be the most significant contributor to VALUE CREATION.

To conclude, it is worth noting that ADD-ONS and BUY & BUILD aim at Δ in EBITDA and are linked to various triggers mentioned earlier. However, these ACTIONS encompass additional facets. In most cases, they involve Δ in NET DEBT, and as this study aims to

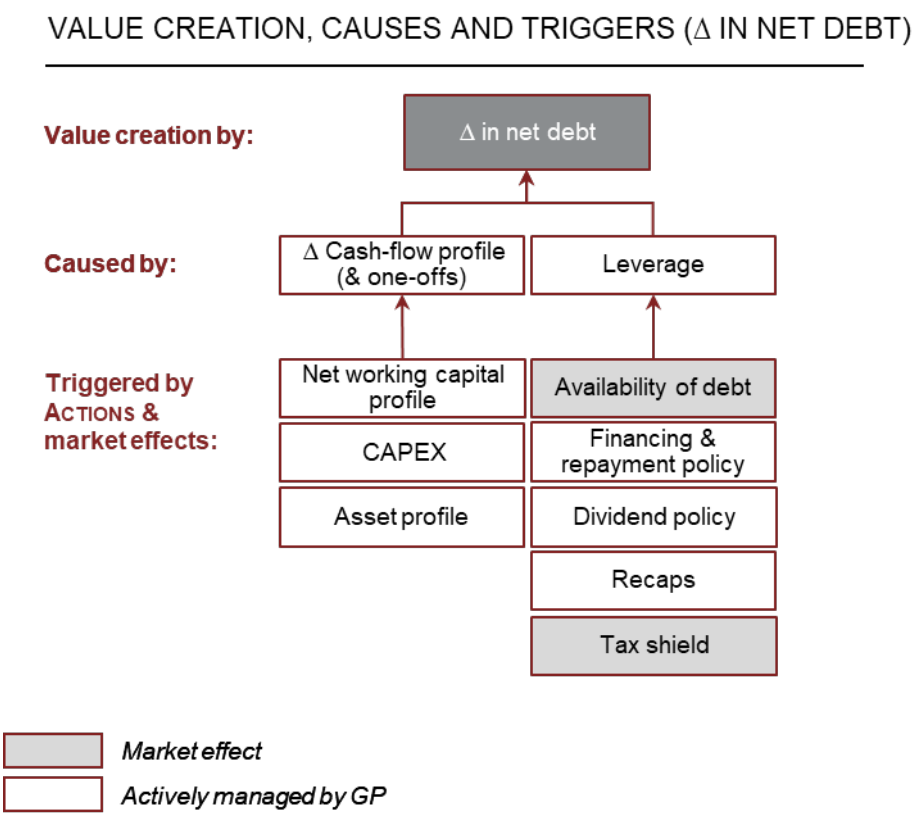
test, are aimed primarily at achieving MULTIPLE EXPANSION. ADD-ONS and BUY & BUILD, the latter as a distinct strategy, are therefore explained in greater detail in due course.

2.8 Δ IN NET DEBT

Closely related to private equity and leveraged buyouts (LBOs) is the concept of acquiring assets with a mix of equity and external debt, such as an acquisition loan by a bank, certain types of senior debt, mezzanine capital, or other financing instruments. The use and down payment of external debt (DELEVERAGE) is among the earliest confirmed sources of VALUE CREATION (see, e.g., Scholes et al., 1990). Under the term financial engineering, it is understood as a form of purchasing companies using substantial amounts of external debt. This debt serves as a tax shield during the down payment throughout the HOLDING PERIOD. However, most importantly, it significantly reduces the amount of equity at hand needed to finance a TRANSACTION. Secondly, as NET DEBT declines, the EQUITY VALUE automatically rises. Figure 11 displays Δ in net debt.

As a negative consequence, which has led to criticism, notable amounts of free cash flows of the PORTFOLIO COMPANIES must in return be spent on reducing the debt throughout the HOLDING PERIOD. The optimization of the capital structure with a corresponding tax shield is one of the most widely acknowledged ACTIONS for VALUE CREATION of GPs, according to Berg and Gottschalg (2005).

FIGURE 11: Δ IN NET DEBT



Source: Own figure/analysis

Before shifting attention to leverage, it makes sense to focus on cash generation. The operating cash flow is directly derived from a firm's EBITDA. All ACTIONS associated with increasing EBITDA are related to Δ in EBITDA. However, a couple of ACTIONS are exclusively linked to what this study refers to as Δ in cash-flow profile (and one-offs). These have also been confirmed in the literature. First, ACTIONS relating to the NWC profile of a firm are commonly initiated by GPs. Put simply, NWC is the sum of inventories and trade receivables minus trade payables taken off the balance sheet of any particular firm. NWC as a total is typically benchmarked as a percentage of sales (as well as days of sales—that is, divided by sales times 365). For clarity, if the NWC in a given year is higher than in the preceding year, its difference is displayed as a cash outflow in the cash-flow statement, which the firm must account for. Due to its immediate effect on cash, GPs closely observe Δ in NWC. For most business models, revenue growth incurs growth in NWC and therefore cash outflow. However, some business models manage growth without a corresponding growth in NWC, or even with

negative NWC, in which case, the more a firm sells, the more cash it has at hand. Examples are companies that do not require inventories—for instance, companies selling virtual goods—or that charge their customers before paying their suppliers. Such business models can be very appealing to GPs. Notwithstanding, almost any PORTFOLIO COMPANY can optimize its NWC profile and thereby reduce the amount of cash bound in NWC. If a GP can permanently (as a percentage of revenues) reduce the NWC, this is a clear trigger for Δ in the cash-flow profile. Jalbert (2022) elucidates NWC in M&A and private equity TRANSACTIONS.

Secondly, CAPEX, particularly the recurring investments a firm must make in its assets, are a central concern for every GP. From a simplified cash perspective, CAPEX equals the delta (previous year minus actual year) of a firm's tangible assets (taken from its balance sheet) plus its depreciation (taken from its P&L; expenses are negative numbers). CAPEX can also include the delta (previous year minus actual year) of a firm's intangible assets (taken from its balance sheet) plus its respective amortization (taken from its P&L; expenses are negative numbers). However, such expenses in R&D may well be recorded separately. CAPEX does not include goodwill and corresponding write-offs in its calculation, which are not cash-relevant.

As CAPEX inherently involves direct negative cash outflows that reduce DELEVERAGE, GPs carefully evaluate its necessity and payback period in every situation. In the early days of private equity, GPs were accused of leaving assets underinvested and in poor condition (Axelson et al., 2009). Specifically, GPs were repeatedly blamed for failing to make necessary investments, such as renewing or adding new machinery (Kaul et al., 2015). With the industry professionalization described in Section 2.2, buyers and their due diligence advisors now focus on the overall condition of facilities, assets, installments, machinery, utilization, and so on, alongside a defined CAPEX budget for the upcoming years. CAPEX underspend, the industry term for underinvestment, is among the easier issues to detect when buying a firm, and buyers deduct it when deriving a purchase price.

The intricacies arise when discerning the timing of CAPEX and differentiating between maintenance and expansion CAPEX, as noted by Lerner et al. (2008). Ordinary or

maintenance CAPEX describes investments to maintain ongoing business and is typically defined as CAPEX up to or equaling yearly depreciation. Instead, expansion CAPEX—any amount in excess of annual depreciation—relates to a (typically significant) investment to reach a strategic target or the next development phase (e.g., additional production lines, a new facility, or a new subsidiary in a foreign country). In such cases, a GP will always evaluate and compare expansion CAPEX against its own HOLDING PERIOD and the precise moment at which it intends to EXIT a PORTFOLIO COMPANY. As a GP progresses further along the HOLDING PERIOD of a PORTFOLIO COMPANY and approaches the anticipated EXIT, the likelihood of approving expansion CAPEX should decrease. The reason is simple: expansion CAPEX will (strongly) either lower NET CASH or raise NET DEBT, thus negatively impacting DELEVERAGE. However, investments (CAPEX) will typically incur a payback period, upon which they become financially beneficial. The evaluation of the appropriateness of payback periods is a separate topic covered by Yard (2000), among others. Due to both industry and firm-level factors, such firm size, leverage, and firm profitability, all of which affect the ability to take on CAPEX, it is difficult to provide average payback periods. The literature shows that highly profitable companies may preserve low CAPEX spending and have an interest in investments with short payback periods (Jaleel and Khan, 2021). Nevertheless, Yard (2000) concludes that payback periods tend to exceed 3 years, while Lerner et al. (2008) notices his findings are largely inconsistent with the hypothesis that private equity-backed firms sacrifice long-term investment.

Given the average HOLDING PERIOD of 4–6 years, it is apparent that returns on CAPEX will often be realized only after EXIT. Despite potential industry-specific variations, we would expect to find a nearly linear decline in expansion CAPEX in the cash-flow statements of PORTFOLIO COMPANIES as the HOLDING PERIOD progresses. This trend is particularly likely if the assumption is that such expansion CAPEX was made to drive VALUE CREATION through EBITDA GROWTH while compensating for negative DELEVERAGE. Yet expansion CAPEX can still be observed in the financial statements of PORTFOLIO COMPANIES in the year of EXIT. As these occurrences become more frequent, the statistical relevance of the payback period and its inherent time lag should become evident. This means that it becomes increasingly unlikely that the motivation

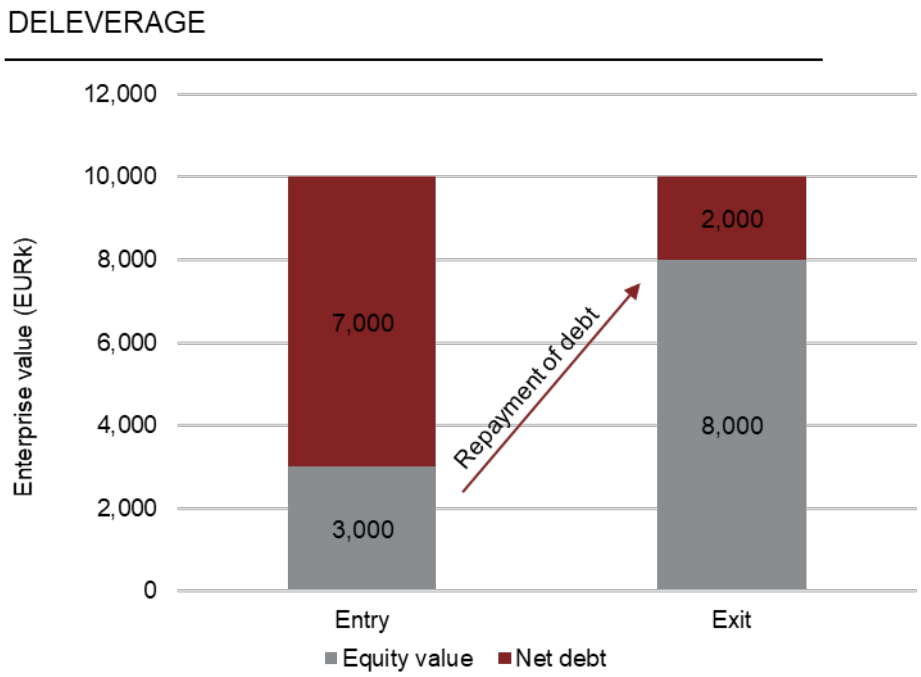
behind CapEx is to drive EBITDA Growth. Instead, this study suggests that GPs striving for Value Creation aim for Multiple Expansion with CapEx, subsequently further narrowed down to LSE CapEx, which is unlikely to positively influence Δ in EBITDA throughout the Holding Period. This relationship is one of the questions that this study will investigate further.

The last Action labeled under Δ in cash-flow profile (one-offs) is the asset profile. This is listed separately from CapEx because GPs have developed a whole set of Actions that aim to increase the efficiency of assets throughout their investments. Sale-and-leaseback transactions, asset disposals, and structural changes are examples of events that either have one-time impacts on Net Debt or permanently change the firm's cash-flow profile. In the early days of private equity, GPs would engage in the questionable practice of asset stripping. Selling the marketable assets of firms, GPs would generate cash, positively affecting Δ in Net Debt. Such practices are confirmed in the literature (e.g., Strömberg, 2009; Jensen, 1970) and have been the source of bankruptcies besides high leverage.

With Δ in cash-flow profile (and one-offs) clarified, the attention turns to leverage as the second key element of Δ in Net Debt throughout the Holding Period. In most cases, a GP will seek external debt from third parties, such as banks or other institutions, in excess of operative financing (e.g., overdraft loans, working capital financing, factoring, and leasing), to finance a Transaction. The first advantage of this approach is that the GP limits its exposure to a single Transaction and capital at risk using debt instruments such as senior term loans, mezzanine, or unitranche financing.

However, a second advantage of using external debt is that, as the firm's Enterprise Value equals the sum of debt and equity, the Equity Value increases by reducing Net Debt. Thus, a GP can create value with neither growth in the EBITDA nor Multiple Expansion, but simply by reducing Net Debt with the money the firm generates (i.e., the yearly cash contribution) throughout the Holding Period. The effect of Deleverage on the Equity Value of a Portfolio Company without change in Enterprise Value is visualized in Figure 12.

FIGURE 12: DELEVERAGE (VISUALIZED)



Source: Own figure/analysis

The level of leverage in a TRANSACTION depends on the availability of debt. Many studies have attempted to answer the question of why buyouts are levered at all (see, e.g., Axelson et al., 2009). Engel et al. (2012) confirm a positive relationship between leverage and deal returns to a threshold level, beyond which over-leverage can happen with negative consequences for the PORTFOLIO COMPANIES.

As a prerequisite to obtaining Leverage, a GP has to find willing lenders. The lending market develops alongside the economic cycle. Typically, during economic downturns, the availability of debt is significantly reduced and/or incurs higher cost (interest rates). Likewise, the amount lenders provide for acquisitions, which is also expressed as an EBITDA MULTIPLE, swings with the overall economy. Furthermore, irrespective of the overall economy, lenders may favor specific industries over others. Certain companies may be better able to access debt than others. Traditional lenders like banks often favor more traditional companies with asset bases as security over asset-light business models. The general availability of debt is not in the hands of the GP and is therefore considered a market effect, displayed in Figure 11.

In contrast, the terms of financing and the repayment policy, including the amount of debt the GP takes on when purchasing a firm, are considered ACTIONS in this study. There are several ACTIONS by GPs associated with leverage. Lopez-de-Silanes et al. (2015) confirm that GPs are skilled at dealing with lenders and can negotiate higher levels of debt at more favorable terms.

Listed as an ACTION below Leverage in Figure 11 is Dividend policy. Numerous GPs eschew dividend payments entirely and instead keep the cash within the PORTFOLIO COMPANIES in order to diminish NET DEBT (and drive DELEVERAGE). Also listed as ACTIONS are recapitalizations. Throughout the HOLDING PERIOD, GPs consider recapitalizations, in which lenders (or financial instruments) are exchanged by others. Such ACTIONS aim at improving the financial structure by implementing debt under more favorable conditions after the initial debt level decreases. This is especially appropriate if a PORTFOLIO COMPANY was acquired with high debt levels (in which case the higher debt and the associated higher risk have led to higher interest rates).

With mezzanine or unitranche financing, recapitalizations are regularly contemplated once total debt relative to EBITDA has declined to moderate levels, for instance, below 4.0x. The tax shield is among the most frequently cited motives for taking on debt in buyout TRANSACTIONS; interest payments reduce a PORTFOLIO COMPANY'S taxable income. Here, because taxes are on the P&L but below EBITDA, the effect on VALUE CREATION is higher cash contribution through lower tax payments and therefore higher DELEVERAGE. While the GP has control of the terms of financing and repayment policy and, thereby, the amount of interest payments, overall, the tax shield in this study is considered a market effect, as taxes are levied under public law at different levels in different countries.

Lahmann et al. (2017) summarize the existing literature noting the positive impacts of debt on GPs' PORTFOLIO COMPANIES. These benefits are confirmed by Kaplan and Stromberg (2009) and Achleitner et al. (2010), who provide evidence that leverage has a consistent positive influence on VALUE CREATION. However, leverage also has downsides. Bergström et al. (2007) found extensive literature elaborating on optimal capital structures, dating back to Modigliani and Miller (1958). Several studies have

examined how much debt should be raised in TRANSACTIONS. Particularly in the 1980s and 1990s, aggressively levered TRANSACTIONS repeatedly resulted in insolvencies and even disruption of financial markets. Axelson et al. (2009) find that PEs raise capital from LPs and supplement equity with third-party outside financing at the individual TRANSACTION level. In later research, investigated private equity firms claiming to use maximum leverage, a claim consistent with the data. However, they find no significant difference between the leverage of GP PORTFOLIO COMPANIES and the median leverage of public firms, taking account of industry, region, and year. Furthermore, they find no relationship between buyout leverage and pre-LBO leverage.

One possible explanation is that market participants have changed their behavior over time. Thus, the data may reflect early-stage PE-backed TRANSACTIONS of the last century. Axelson et al. (2013) make a vital point: Market conditions define the level of leverage in TRANSACTIONS and, therefore, the pricing of deals. The availability of leverage leads GPs to pay higher EBITDA MULTIPLES. In addition, they find pricing strongly negatively related to current market interest rates on loans, likewise confirming the importance of leverage in TRANSACTIONS.

Besides the question of how much debt should be raised, the availability of debt depends on economic cycles and lenders' willingness to invest, with a substantial impact on the pricing of TRANSACTIONS. Secondly, lenders' appetite and willingness to provide debt levels at MULTIPLE of EBITDA (e.g., 3.0x or 4.0x) is sector-specific and highly dependent on the cash-flow profile of an asset and its asset base (as security for the lender).

2.9 Δ IN EBITDA MULTIPLE

Having grasped the basic principles of Δ in EBITDA and Δ in NET DEBT, the attention turns to the question of what potentially causes Δ in EBITDA MULTIPLE and, therefore, MULTIPLE EXPANSION as a relevant part of VALUE CREATION.

As displayed in Figure 13, Δ in EBITDA MULTIPLE is caused by market cyclicity or strategic value and Δ in growth profile. For the purposes of this study, growth profile

refers to the overall attractiveness of a firm, based on the strength of its strategic positioning, its current condition, and its likelihood and readiness to achieve future growth with given resources. Market cyclicity can be a significant cause of Δ in EBITDA MULTIPLE. As stock-listed comparable companies fluctuate with market conditions, the valuation of privately held companies fluctuates alongside. Therefore, buying in a high market and selling in a low market will negatively impact Δ in EBITDA MULTIPLE. Market cyclicity is beyond the power of a GP.

Nonetheless, GPs are not powerless in the face of capital market developments and the resulting fluctuations in market EBITDA MULTIPLES. On the contrary, GPs actively monitor economic cyclicity and implement ACTIONS aligned with changes in the economic cycle to create value. Moreover, GPs constantly monitor market EBITDA MULTIPLES and industry M&A activity. Several studies find that, when it comes to TRANSACTIONS, managing and timing are essential skills of GPs (see, e.g., Achleitner et al., 2011; Kaplan and Stromberg, 2009; Renneboog et al., 2008)[10].

Δ in the cost of capital, which is related to market cyclicity and Δ in EBITDA MULTIPLE, is also a market effect and is particularly relevant to debt. As explained in the context of debt availability, a high appetite among lenders to provide debt and low interest rates may lead to higher EBITDA MULTIPLES in MULTIPLE-BASED VALUATION. For example, Axelson et al. (2013) conclude that when high levels of leverage are readily available,

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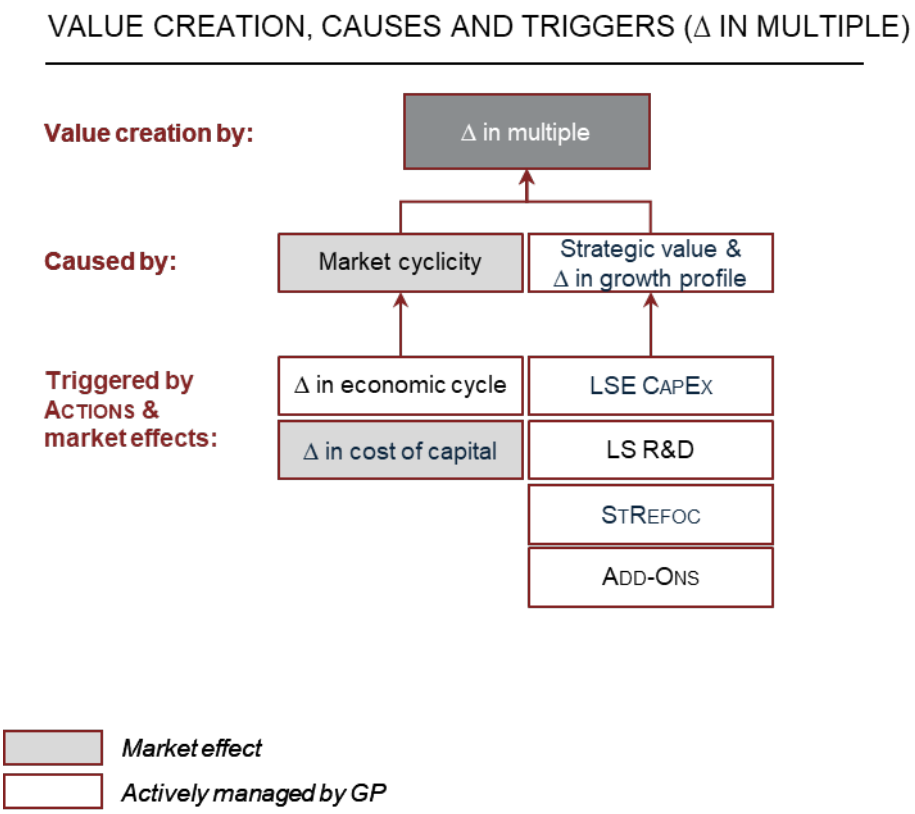
[10] For completeness, it should be noted that recessive market environments adversely impact two specific situations. First, when a GP is fundraising while LPs are forced to reduce their allocation volume in private equity, which is typically a percentage of their total AuM. This reduction is driven by an overall decline in portfolio valuation (comprising various asset classes, often with substantial shares of bonds, real estate, and stocks, with alternative assets such as private equity typically accounting for only 5–10% of total AuM). Declining stock market valuations in particular may compel LPs to invest significantly less or even reduce their investments in private equity funds to avoid overallocation.

The second situation occurs when a GP is at the absolute end of its fund's life and must sell one or more assets immediately due to the end of the term. In such cases, GPs experience a primarily market-driven negative Δ in EBITDA MULTIPLE based on Δ in the economic cycle. For this reason, however, ENTRIES and EXITS typically occur sequentially over the fund's life.

GPs may use the maximum amount of leverage available and potentially overpay in TRANSACTIONS.

FIGURE 13: Δ IN MULTIPLE



Source: Own figure/analysis

Strategic value and Δ in growth profile, which affects Δ in MULTIPLE, is a more intriguing and less explored area than market cyclicity. This study tests four distinct ACTIONS through the hypotheses set out in Section 3.

LSE CAPEX will be tested for its effect on Δ in MULTIPLE. As previously explained, the specific point in time at which the GP finds itself during the HOLDING PERIOD is essential for investment decisions. The longer the GP is invested in a firm, and the closer it is to its anticipated EXIT, the more disinclined it will be to support expansion CAPEX within a PORTFOLIO COMPANY. The reason for this is straightforward: CAPEX are cash outflows that reduce a PORTFOLIO COMPANY'S cash contribution, lowering VALUE CREATION through DELEVERAGE. However, LSE CAPEX has been identified as a potential ACTION implemented by GP to reach MULTIPLE EXPANSION. This variable, which is described in

more detail in Section 3, refers to investments in tangible assets in excess of depreciation in the year of EXIT. Since LSE CAPEX negatively impacts Δ in NET DEBT with potentially little to no effect on Δ in EBITDA, the primary motivation behind these investments may be to influence Δ in MULTIPLE.

Secondly, corresponding late-stage R&D investments (LS R&D), describing investments in the intangible asset base close to EXIT, will be tested for their effect on Δ in MULTIPLE. Likewise, LS R&D negatively impacts Δ in NET DEBT, with potentially little to no effect on Δ in EBITDA. The primary motivation behind these investments may also be to have a positive influence on Δ in MULTIPLE.

If VALUE CREATION were solely driven by EBITDA GROWTH and DELEVERAGE, it would be illogical for a GP to engage in ACTIONS that only pay off after EXIT. However, this is clearly not the case. A PORTFOLIO COMPANY'S purchaser is interested in a firm's future potential, not its past performance. When selling a firm, a GP is essentially selling its future, and the buyer's decision will be based on a business plan where growth assumptions must be plausibly and convincingly supported. Therefore, GPs engage in ACTIONS that generate strategic value and Δ in growth profile and which are ultimately realized beyond their own HOLDING PERIOD.

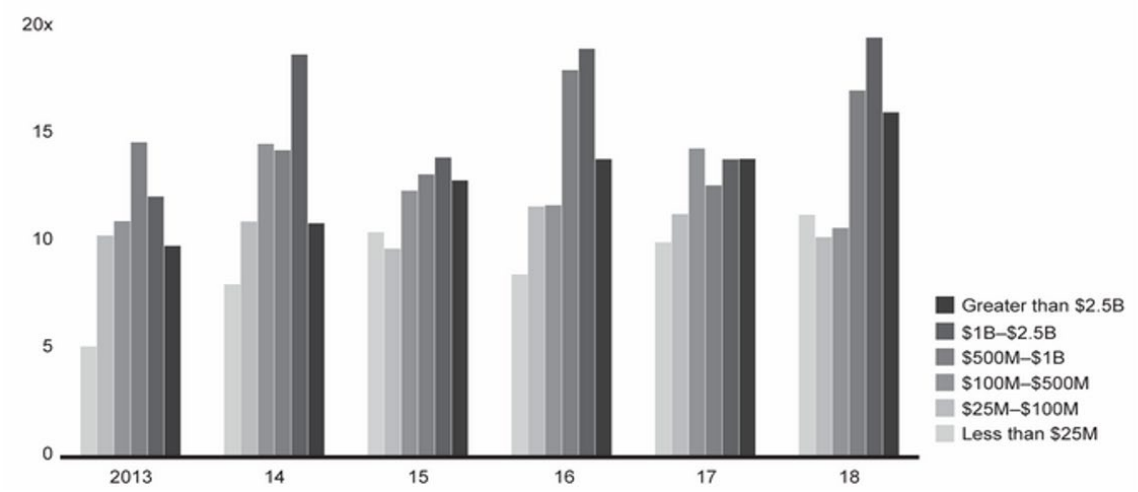
STREFOC represents a set of ACTIONS initiated by a GP to attract strategic buyers as the preferred EXIT route. Strategic buyers often pay higher EBITDA MULTIPLES than GPs due to potential synergies. Therefore, a strategic buyer is often the most desirable option for an EXIT. However, a strategic buyer's view of a target firm often deviates from a GP's view. For example, a strategic buyer will most often be interested in a particular product, technology, or market. Hence, firms with activities in unrelated business segments and a broad focus are often not in the interest of a strategic buyer, who will question the usefulness of such other activities. Therefore, refocusing activities are among the ACTIONS GPs perform to reshape a PORTFOLIO COMPANY'S strategic value and Δ in growth profile to positively influence Δ in MULTIPLE.

As the last point under strategic value and Δ in growth profile, the following is considered regarding ADD-ONS and designated BUY & BUILD. As CAPEX, first of all, M&A incurs investment that negatively affects Δ in NET DEBT before eventually realizing

its full impact on Δ in EBITDA. ADD-ONS are a very lengthy process, as integration and realization of synergies require time. As with CAPEX, GPs are reluctant to pursue such ACTIONS when approaching their envisaged EXIT for the purpose of EBITDA GROWTH. However, if a TRANSACTION significantly enhances a firm's growth potential, its attractiveness is immediately reflected in a higher EBITDA MULTIPLE. In that case, GPs pursue such ACTIONS despite negative implications for DELEVERAGE. Secondly, with BUY & BUILD, MULTIPLE EXPANSION is the core target.

Bain (2019) refers to BUY & BUILD as an antidote to soaring deal MULTIPLES, as "a buy-and-build strategy allows a GP to justify the initial acquisition of a relatively expensive platform company by offering the opportunity to tuck in smaller add-ons that can be acquired for lower multiples later on." This strategy can be used in different scenarios.

FIGURE 14: MEDIAN EBITDA PURCHASE PRICE MULTIPLES FOR GLOBAL BUYOUT TRANSACTIONS BY DEAL SIZE



Source: PitchBook Data, Inc.

The underlying idea is that smaller firms consistently trade for lower MULTIPLEs than bigger ones, as displayed in Figure 14. Usually, bigger companies buy smaller ones. Once the additional EBITDA of the smaller firm is attached to the larger group, it immediately enjoys a higher valuation, thereby creating strategic value as the basis for a positive Δ in MULTIPLE upon EXIT.

While Nikoskelainen and Wright (2007), Valkama et al. (2013), and Lahmann et al. (2017) all link BUY & BUILD to VALUE CREATION, they fail to attribute this to MULTIPLE EXPANSION. Vester (2011) finds that almost a quarter of the total private equity VALUE CREATION was due to MULTIPLE EXPANSION. This makes it a significant component of GPs' returns, with a considerable impact contributing to more than 20% of the total VALUE CREATION in his dataset. In analyzing the origins of the high share of MULTIPLE EXPANSION in VALUE CREATION, he notes that GPs execute on opportunities for MULTIPLE EXPANSION and isolated the following attributes: carve-outs, the creation of strategic assets, the purchase of under-appreciated assets, and general growth equity situations. While Vester's study expands on ACTIONS, the view in the literature is still narrow, arguing that strategic improvements are difficult to measure due to their restricted quantifiability. Vester (2011) describes the number of empirical studies as low and refers to Bergström et al. (2007) and Phan and Charles (1995), who empirically demonstrate a shift in ACTIONS after a GP's ENTRY. This study will link ACTIONS directed at strategic value and Δ in growth profile to MULTIPLE EXPANSION and VALUE CREATION.

2.10 SUMMARY

Chapter 2 has provided a clear definition of private equity funds, their activities, and their representation in academic literature, alongside current market dynamics. In a landscape marked by a significant increase in active GPs, managing ever-growing AUM and executing larger deals, the volume of TRANSACTIONS has not kept pace (Preqin, 2021). This has intensified the competition (Ahlers et al., 2016) and the complexity of TRANSACTIONS, raising the risk of overpaying (Puche and Braun, 2019). In response, GPs have developed ACTIONS for VALUE CREATION, focusing on its three components: EBITDA GROWTH, DELEVERAGE, and MULTIPLE EXPANSION (Kaplan and Stromberg, 2009).

To lay the foundation for the hypotheses developed in Chapter 3, Chapter 2 began by emphasizing MULTIPLE-BASED VALUATION and the importance of distinguishing between the income statement, cash flow statement, and balance sheet to highlight how VALUE

CREATION is constructed. Only with this foundation can ACTIONS be precisely attributed to the correct component of VALUE CREATION. Building on this background, a framework was developed to illustrate precisely how ACTIONS established in the academic literature (see, e.g. Castellaneta et al., 2019), trigger value changes within each of the three components of VALUE CREATION—EBITDA GROWTH, DELEVERAGE, and MULTIPLE EXPANSION—despite the inherent complexity.

Among the three components of VALUE CREATION, MULTIPLE EXPANSION has been largely overlooked in the academic literature, notwithstanding being an integral aspect of VALUE CREATION. This omission is particularly evident when considering specific ACTIONS for MULTIPLE EXPANSION implemented by GPs, as noted by Achleitner et al. (2011) and Lahmann et al. (2017). Several reasons account for this oversight: the difficulty of measurement due to lack of data, particularly at the level of individual TRANSACTIONS; a lack of understanding or consideration of MULTIPLE-BASED VALUATION; reliance on macroeconomic factors, such as fluctuating stock market valuations and economic cycles; limited awareness of the fact that GPs take concrete ACTIONS aimed specifically at MULTIPLE EXPANSION; and misattribution of ACTIONS aimed at MULTIPLE EXPANSION to other components of VALUE CREATION.

Building on the framework set out in this chapter, Chapter 3 formulates hypotheses regarding ACTIONS that may have a positive impact on MULTIPLE EXPANSION. This research aligns with the growing interest in MULTIPLE EXPANSION within the academic literature (Puche and Braun, 2019), coupled with the rising share of MULTIPLE EXPANSION in overall VALUE CREATION seen in the private equity market in recent years (Bain, 2020).

3 THEORY AND HYPOTHESES

As a basis for understanding and analyzing VALUE CREATION between the ENTRY and EXIT of a PORTFOLIO COMPANY, Chapter 2 examined MULTIPLE-BASED VALUATION. It has emphasized the context of accounting as the basis for understanding how certain P&L and balance sheet items drive changes in value. It was shown that VALUE CREATION (or, occasionally, loss) results from three components: EBITDA GROWTH, DELEVERAGE, and MULTIPLE EXPANSION. Each of these three components is inherent in every PARTICIPATION and inevitably makes a positive or negative contribution to VALUE CREATION.

Furthermore, the ACTIONS identified in the literature were categorized within a framework that aligns them with the relevant components of VALUE CREATION to clarify their specific effects. Chapter 3 builds on Chapter 2 by thoroughly analyzing ACTIONS that are commonly observed during GP HOLDING PERIODS and proposing that such ACTIONS are specifically targeted at achieving MULTIPLE EXPANSION. This analysis also considers ACTIONS that may have been previously overlooked due to limited data availability or their perceived contradictions with current understanding. The latter refers to ACTIONS that deviate from the assumed behavior of GPs, with no reference to VALUE CREATION being implied. As the chapter progresses, the hypotheses underlying the study's quantitative analysis are introduced. The chapter concludes by outlining key control variables that are incorporated into the subsequent analysis.

3.1 LSE CAPEX

As part of the discussion on Δ in NET DEBT, Section 2.8 has extensively elaborated on the existing debate on CAPEX in a general business context and in the field of private equity TRANSACTIONS.

To recapitulate, in a more general business context, academic research, such as Dean (1953) and Chambers et al. (1999), discusses CAPEX, pinpointing specific spending ratios and investment levels that are optimal for achieving diverse business objectives,

ranging from sustaining operations to enabling expansion. Such literature evaluates the effectiveness of CAPEX amid the conflicting interests of management and shareholders, as summarized by Lerner et al. (2008).

In the field of private equity TRANSACTIONS, two key areas of focus emerge: the structurally induced constraints faced by PORTFOLIO COMPANIES following the ENTRY and the restrictive spending policies adopted by GPs. The primary concern in debates regarding the structuring of TRANSACTIONS at ENTRY revolves around high debt levels and the resultant constraints on CAPEX, with debt servicing limiting investments. Lichtenberg and Siegel (1989) explored the impact of LBOs on CAPEX and highlighted the risk of underinvestment stemming from substantial leverage.

The second area of research, more closely connected to governance, examines restricting spending policies, underinvestment (Kaplan, 1989), and asset sales (asset stripping), as detailed by Kester and Luehrman (1995). These practices are influenced by private equity firms' relatively short HOLDING PERIODS and GPs' drive for VALUE CREATION. Consequently, GPs have faced criticism for leaving PORTFOLIO COMPANIES underinvested.

Building on the concept of VALUE CREATION and the framework outlined in Section 2.5, the academic debate on CAPEX in private equity TRANSACTIONS therefore centers on the concept of DELEVERAGE (Section 2.8). In their year of occurrence, CAPEX represent cash outflows that negatively affect cash contributions, thereby impacting VALUE CREATION through DELEVERAGE. The capacity to undertake substantial investments (CAPEX) may be constrained by the level of debt incurred to finance ENTRY, which forms the basis for DELEVERAGE.

Instead, the literature on CAPEX and EBITDA GROWTH—the second component of VALUE CREATION in private equity—remains relatively sparse. In any business environment, the primary motives for CAPEX are to strengthen a firm's competitive position, enhance operational efficiency, support strategic growth initiatives, and ensure long-term sustainability. Such investments are economically viable only if the resulting EBITDA GROWTH exceeds the initial cost within a specified payback period.

For GP-led PORTFOLIO COMPANIES, the timing of such investments is critical given the relatively short HOLDING PERIOD, as it directly affects the GP's ability to benefit from EBITDA GROWTH prior to EXIT. Consequently, GPs rigorously assess the necessity and timing of investments.

The role of CAPEX in driving MULTIPLE EXPANSION, the third component of VALUE CREATION, remains underexplored in the literature. It is well established that GPs tend to prefer asset-light business models (Ernst & Young, 2021), which is reflected in the higher EBITDA MULTIPLES such businesses command (though this in itself does not directly influence MULTIPLE EXPANSION). As part of their due diligence, GPs evaluate the business plans of target companies and typically formulate their own business plans for the HOLDING PERIOD up to the EXIT, including annual CAPEX allocations. While there is undoubtedly a connection between CAPEX and MULTIPLE EXPANSION, it is difficult to conclude that GPs explicitly target MULTIPLE EXPANSION or it is instead a secondary effect.

However, it is possible to construct a scenario under which CAPEX is unlikely to be directed at EBITDA GROWTH and instead must be targeted at MULTIPLE EXPANSION. This approach requires consideration of various characteristics of CAPEX (Section 2.2), the distinction between maintenance CAPEX and expansion CAPEX, and the typical payback period of investments. Assuming that an average payback period for CAPEX is unlikely to be less than 3 years (Yard, 2000), it probably does not make sense for a GP, in terms of EBITDA GROWTH, and with an average HOLDING PERIOD of 4–6 years, to engage in expansion CAPEX halfway through the HOLDING PERIOD. Nonetheless, to further enhance analytical rigor, what happens if one shifts the focus to the year of EXIT?

Reflecting on the preceding analysis and the calculation of VALUE CREATION (Section 2.2), if expansion CAPEX (defined as CAPEX in excess of depreciation) is observed in the year of EXIT, it is highly unlikely to contribute to VALUE CREATION through EBITDA GROWTH within the same year. However, such investments invariably reduce DELEVERAGE. In practice and based on examination of data, the financial statements

of PORTFOLIO COMPANIES often reveal expansion CAPEX occurring close to the GP's EXIT, commonly referred to as late-stage expansion CAPEX (LSE CAPEX).

According to the literature cited above, this pattern is unexpected. If GPs are generally restrictive about CAPEX, why do PORTFOLIO COMPANIES consistently undertake CAPEX near the end of the HOLDING PERIOD given its limited potential to quickly enhance EBITDA GROWTH and its negative impact on DELEVERAGE? Economically, this suggests that GPs allow LSE CAPEX at PORTFOLIO COMPANIES with the primary objective of achieving MULTIPLE EXPANSION.

In essence, PORTFOLIO COMPANIES exhibit LSE CAPEX because GPs deliberately aim to achieve a higher EBITDA MULTIPLE on sale, thereby increasing the Δ in MULTIPLE. The hypothesis that GPs can enhance VALUE CREATION through LSE CAPEX—despite the PORTFOLIO COMPANIES realizing the benefits only after the HOLDING PERIOD— is novel. This VALUE CREATION occurs specifically through MULTIPLE EXPANSION.

This perspective contrasts sharply with prior critiques, such as Kester and Luehrman (1995), portraying GPs negatively in terms of their socio-economic behavior. Moreover, it highlights a significant gap in the literature, as the impact of CAPEX (particularly of LSE CAPEX) on MULTIPLE-BASED VALUATION remains largely undocumented. This gap underscores the need for a deeper understanding of the ACTIONS and strategies employed by GPs to drive VALUE CREATION.

This leads to the first hypothesis:

HYPOTHESIS 1

H_0: Late-stage expansion CAPEX (LSE CAPEX) has no significant effect on MULTIPLE EXPANSION ($\beta_1 = 0$)

H_1: LSE CAPEX has a significant positive effect on MULTIPLE EXPANSION ($\beta_1 > 0$)

3.2 LS R&D

LS R&D is to intangible assets what LSE CAPEX is to tangible assets. Similarly, R&D has been discussed in academic literature both in general business contexts and in the context of private equity TRANSACTIONS. As cited below, such discussion typically revolves around debates on the optimal level of R&D investment, often overlooking the discrepancy between the R&D's payback period and the relatively short HOLDING PERIOD characteristic of private equity.

In contrast to CAPEX, the academic literature generally takes a more favorable view of the impact of GPs on R&D within their PORTFOLIO COMPANIES. Investigating concerns that GPs might prioritize short-term profits at the expense of long-term growth, Lerner et al. (2008) find no evidence of reduced R&D activity. Instead, their findings reveal high patenting activity, no significant changes in the fundamental nature of the research, and a concentration of efforts in areas with greater technological innovation in PORTFOLIO COMPANIES. Similarly, Capizzi et al. (2011) find that GP-led firms tend to have stronger intangible asset bases than non-GP-led firms, reflecting higher levels of R&D activity. Furthermore, Cirillo et al. (2019) note that while family involvement in ownership reduced the intensity of firms' R&D activity, this negative effect was mitigated when GPs also held shares.

Beyond the above, R&D has been more clearly linked to positive VALUE CREATION than CAPEX. Studies such as Battisti et al. (2019) find that innovation plays a critical role in establishing a sustainable competitive advantage and is directly associated with VALUE CREATION. However, a gap remains in understanding how such investments are accounted for at the point of EXIT. Overall, the academic research cited above shares a significantly more favorable view of GPs' impact on R&D compared to CAPEX, which may stem in part from the fact that the body of research on R&D is relatively more recent.

However, the issue of the timing of R&D investment during the HOLDING PERIOD mirrors the challenges associated with CAPEX. As Lerner et al. (2008) note, R&D expenditures are inherently long-term investments—their costs are recognized immediately, but their

benefits often take years to materialize. Given that R&D expenditures are potentially even more long-term oriented than CAPEX, GPs should theoretically be even less inclined to pursue such investments close to EXIT if the goal were solely positive VALUE CREATION through EBITDA GROWTH. Nevertheless, the financial statements of GP-led firms frequently reveal late-stage R&D near EXIT (LS R&D). Similar to LSE CAPEX, LS R&D reduces DELEVERAGE, indicating that GPs likely pursue LS R&D with the primary objective of achieving MULTIPLE EXPANSION.

This leads to the second hypothesis:

HYPOTHESIS 2

H_0: Late-stage R&D has no significant effect on MULTIPLE EXPANSION ($\beta_2 = 0$)

H_2: Late-stage R&D has a significant positive effect on MULTIPLE EXPANSION ($\beta_2 > 0$)

3.3 STRATEGIC REFOCUS AND COMPLEXITY REDUCTION (STREFOC)

Reflecting on Chapter 2, this study has consistently underscored the ambition of GPs to drive VALUE CREATION through deliberate and guided ACTIONS. It has also emphasized the extensive involvement of GPs in these processes, a fact well-documented in the literature. For instance, Meuleman et al. (2009) argue that VALUE CREATION in buyouts requires active participation by GPs, who may even play a role in developing entrepreneurial competence. Strategic refocus and complexity reduction comprises ACTIONS GPs take both at the ENTRY and EXIT. When analyzing these ACTIONS—such as acquiring spin-offs, discontinuing certain business operations, divesting business units, and outsourcing ancillary activities to focus on core business lines—it may initially be difficult to discern a clear connection to VALUE CREATION.

On the purchasing side (at ENTRY), earlier studies, including Barber and Goold (2007), recognized GPs as skilled acquirers of non-core business units from major (public) companies. They observed that certain funds have been particularly effective in VALUE CREATION through acquiring spin-offs. Given the strategic decisions made by the corporate seller, these entities—often termed corporate orphans—frequently become

irrelevant to the seller's future strategy. Such spin-offs are usually acquired under favorable conditions, as the seller prioritizes a swift divestiture. This enables GPs to revitalize and strategically realign these assets outside of the constraints of their original, larger organizational framework. Once revitalized, such assets may attract strategic interest from third-party corporate buyers, offering considerable potential for MULTIPLE EXPANSION.

On the vendor's side (at EXIT), a recent analysis by Biesinger (2020) links divesture to VALUE CREATION. Given the common understanding that GPs aim at VALUE CREATION and that ceasing activities is unlikely to contribute to EBITDA GROWTH—and at best contributes to DELEVERAGE (in the case of divestiture)—the motive underlying such endeavors warrants examination.

Amongst other factors, strategic buyers typically focus on acquiring specific technologies and specialized businesses. As a result, they tend to avoid conglomerates or enterprises with unrelated business segments, as these lack strategic alignment with their existing operations. Consequently, GPs may consider divesting and selling off units separately to attract greater interest from strategic buyers in an attempt to generate MULTIPLE EXPANSION. Despite the potentially negative impact on EBITDA GROWTH, STREFOC may still be validated as a key ACTION employed by GPs for VALUE CREATION through MULTIPLE EXPANSION. If validated, this would deepen the understanding of GP-initiated ACTIONS.

This leads to the third hypothesis: STREFOC is undertaken to generate MULTIPLE EXPANSION:

HYPOTHESIS 3

H_0: Strategic refocus has no significant effect on MULTIPLE EXPANSION ($\beta_3 = 0$)

H_3: Strategic refocus has a significant positive effect on MULTIPLE EXPANSION ($\beta_3 > 0$)

3.4 Add-ons

The literature associates private equity with inorganic growth through acquisitions, ranging from individual Add-Ons to comprehensive Buy & Build strategies, in which four or more Add-Ons are integrated into a Portfolio Company. As outlined by Gilligan and Galpin (2022), this strategy involves acquiring a platform firm with well-established internal capabilities. Smaller companies are then acquired and integrated into this platform company with the aim of creating a larger and more valuable entity. Nikoskelainen and Wright (2007), Valkama et al. (2013), and Lahmann et al. (2017) link Add-Ons and Buy & Build strategies to Value Creation. However, as Hammer et al. (2022) note, little is known about the explicit mechanisms by which Value Creation is achieved through Add-Ons or Buy & Build strategies.

In their large sample study, Hammer et al. (2022) confirm that GP-led Transactions involving Add-Ons outperform those without, driven by above-average top-line growth (contributing to EBITDA Growth, partially through acquired revenue) and benefiting Multiple Expansion. The specific impact and contribution of Add-Ons to total Value Creation remains unclear, as their measurement of Multiple Expansion relies solely on the relative increase in EBITDA Multiple from Entry to Exit, expressed as CAGR. With this, the data and methodologies they use differ fundamentally from those used in this study.

This study proposes a novel hypothesis linking Add-Ons and Buy & Build directly to Multiple Expansion, positing that the primary aim of both is to enhance Multiple Expansion. It further proposes an increase in Multiple Expansion with the number of Add-Ons and Buy & Build as a distinct strategy.

This leads to the fourth and final hypothesis:

Hypothesis 4

H_0: Add-Ons have no significant effect on Multiple Expansion ($\beta_4 = 0$)

H_4: Add-Ons have a significant positive effect on Multiple Expansion ($\beta_4 > 0$)

3.5 THEORETICALLY MOTIVATED CONTROLS

3.5.1 EXIT TO STRATEGIC BUYERS (STRATEGIC EXIT)

STRATEGIC EXIT defines whether the GP sold the company to a strategic buyer—that is, a corporation—instead of another financial investor. With regards to Hypotheses 1–4, from a theoretical perspective, it is important to control for the potential influence STRATEGIC EXITS may have on the EBITDA MULTIPLE paid at EXIT and, therefore, on MULTIPLE EXPANSION.

A number of studies discuss the so-called premiums strategic buyers pay for acquisitions. Bargeron et al. (2008) find that target shareholders receive 55% more if a public firm instead of a GP makes the acquisition. Gorbenko and Malenko (2014) note that the typical target is valued higher by strategic bidders, except for mature, poorly performing companies, which are valued higher by financial bidders for 22% of their sample. In any case, the basis of such higher valuation is long-term (operational) synergies that strategic buyers can realize upon integrating acquisitions into their business. In addition, valuations by strategic bidders are also less correlated (vs. GPs) with aggregate economic conditions (Gorbenko and Malenko, 2014). The deal activity of GPs and strategic buyers is not synchronous (Chiarella and Ostinelli, 2020), making strategic buyers attractive as a stable and long-term buyer group, particularly as they are less dependent on acquisition financing. In addition, according to Chiarella and Ostinelli (2020), GPs tend to particularly engage in ENTRY TRANSACTIONS in times of better economic prospects, which could be due to the high returns required by their LPs, combined with GPs' shorter investment horizon and greater pressure to invest. Therefore, for GPs, a STRATEGIC EXIT often proves to be not only more financially beneficial than selling to other GPs, who tend to pay significantly less for their acquisitions (Bargeron et al., 2008), but also a more stable EXIT option.

3.5.2 MANAGER Δ

From a theoretical perspective, a change in the strategic value and Δ in growth profile beyond the HOLDING PERIOD may also be triggered by a change in management within

a PORTFOLIO COMPANY, in light of transformation, increasing capabilities, or as part of the EXIT story.

Initially, MANAGER Δ is most commonly related to current performance and a GP's skepticism that a manager (or management team) has the necessary skills and knowledge to meet the company's challenges. Gong and Wu (2011) document a 51% CEO turnover rate within the first 2 years in their sample. In the present study, 63% of PORTFOLIO COMPANIES experience MANAGER Δ, aligning with their results. Gong and Wu (2011) find the probability of CEO turnover to be higher in companies with severe cash flow problems, most commonly resulting from below-expectation operating performance. Kaplan and Stromberg (2009) find that MANAGER Δ initiated by GPs tends to improve the performance of acquired companies and generate higher returns, with smaller companies benefiting more from MANAGER Δ than larger companies.

Given the findings of these studies, one may expect that MANAGER Δ will trigger EBITDA GROWTH and DELEVERAGE due to the measures the new, potentially higher-skilled managers, who might be more aligned with the GPs' ACTIONS, take within the firms. Beyond a status quo reaction in response to current performance, the high rate of CEO turnover indicates that GPs might specifically search for so-called badly managed companies beforehand and that MANAGER Δ is part of the overall VALUE CREATION strategy.

A broad range of literature investigates such interrelationships. Matthews et al. (2009) emphasize the interplay of the GP's deal team, operating partners (board members and/or industry experts employed by the GP), and the existing management team as a source for VALUE CREATION. They argue that there is a general preference of GPs to work with the incumbent CEOs as this lowers friction and disruption within the companies (enhancing morale and reducing nervousness in times of transition), leading to broader support unless management is part of the problem, in which case MANAGER Δ is a necessary key source of change and VALUE CREATION. Management teams very often take equity shareholdings in TRANSACTIONS, which means that managerial ownership plays an economically and statistically significant role. Indeed, funds in which directors have low ownership, or little "skin in the game," significantly

underperform (Cremers et al., 2009). As a result, one might conclude that some GPs might consider managerial change to be a core part of their ACTIONS Instead, other GPs seem to take such ACTION throughout their HOLDING PERIOD only upon necessity.

In addition, despite satisfactory (current) operating performance, a GP might replace a manager due to several other motives. These might include lack or loss of trust due to misconduct, lack of transparency, misalignment, or cultural or other reasons. However, these motives might be more strategic and therefore more long-term oriented. It could be that the GP wants to drastically change the company's strategy and needs a manager with a different skill set to prepare the company for the future or pursue new business opportunities. This study tests whether MANAGER Δ triggers strategic value and Δ in the growth profile, thereby creating MULTIPLE EXPANSION. It controls for the argument that beyond new managers' effects on EBITDA GROWTH and DELEVERAGE, a new management team may also transmit higher confidence to potential buyers in the future development of a firm, thereby sharpening the growth profile and creating MULTIPLE EXPANSION.

3.5.3 MARKET CYCLES

As previously noted and discussed in scholarly discourse, market cycles influence MULTIPLE EXPANSION. To account for this influence, market MULTIPLES corresponding to the TRANSACTION dates will be incorporated as control variables in the analysis. The ARGOS INDEX will serve as a reference.

The ARGOS INDEX, a private equity valuation barometer, primarily examines MULTIPLES of mid-market TRANSACTIONS. It is a tool used by investors, analysts, and industry experts to assess market trends and align private deal valuations with broader market dynamics. It is notably used by the European Investment Fund. Curated by Argos Wityu, the index aggregates empirical TRANSACTION data and furnishes a quarterly report on private company valuations, offering a rigorous foundation for market analysis. As Braun et al. (2017) note, controlling for fund investment dates is essential, as market cycles fluctuate significantly over time.

4 SAMPLE SELECTION AND METHODOLOGY

This chapter begins by briefly outlining the regression analysis, which provides a preliminary basis for the subsequent tests. Before presenting the regression analyses in Section 5, a detailed description of the characteristics of the dataset, consisting of 68 PORTFOLIO COMPANIES, with consequentially 136 TRANSACTIONS (ENTRY and EXIT), and the variables employed in the analysis is provided. Following the explanation of the dataset, an initial series of tests are conducted to assess the validity of the proposed hypotheses, including the *t*-test, the Wilcoxon rank-sum test (Mann-Whitney U test), and the median test. These tests aim to identify significant differences in means between MULTIPLE EXPANSION and each independent/predictor variable (LSE CAPEX, LS R&D, STREFOC, and ADD-ONS). Specifically, the comparison will be between MULTIPLE EXPANSION and the groups where one ACTION may or may not apply to a given PORTFOLIO COMPANY. To account for the potential influence of TRANSACTION size, the same tests will be performed on the logarithm of MULTIPLE EXPANSION, thereby reducing the potential influence of outliers. Based on these results, the study proceeds with regression analysis, thereby testing the validity of the hypotheses in a multivariate setting.

The general form of the regression equation is as follows:

$DV = \beta_0 + \beta_1 \text{LSE CAPEX} + \beta_2 \text{LS R\&D} + \beta_3 \text{STREFOC} + \beta_4 \text{ADD-ONS} + \text{Controls} + \varepsilon$

Where:

- *DV* represents the dependent variable, MULTIPLE EXPANSION
- β_0 is the intercept
- β_1, β_2, β_3, and β_4 represent the regression coefficients for the key independent variables
- Controls represents a vector of control variables
- ϵ represents the error term

4.1 DEFINITION OF THE VARIABLES

Following the comprehensive discussion of the ACTIONS that will serve as independent variables in Section 3 and the development of Hypotheses 1–4, the subsequent section briefly outlines the definition of the variables. For the sake of doubt, refer to the Definitions (pages 8 ff.) for a detailed explanation of any term written in small caps. This dataset is used in forthcoming statistical tests and regression analyses to confirm the validity of the hypotheses.

4.1.1 DEPENDENT VARIABLE

MULTIPLE EXPANSION is calculated as the Δ in MULTIPLE between the two TRANSACTIONS at the ENTRY and the EXIT multiplied by the EBITDA at EXIT of a PORTFOLIO COMPANY. It expresses the amount of VALUE CREATION gained (or lost) by selling a PORTFOLIO COMPANY at a higher (or lower) EBITDA MULTIPLE than that at which it was purchased. The values for MULTIPLE EXPANSION were calculated for each of the total of 68 PORTFOLIO COMPANIES in the sample, resulting in a series of values ranging from EUR -49m[11] to EUR +2.2bn (Median = EUR 11.9m).

[11] *Negative numbers arise from PARTICIPATIONS in which GPs realize negative VALUE CREATION, meaning that they realize a loss. In the dataset, 13 PARTICIPATIONS created negative value. MULTIPLE EXPANSION, the set of values referred to above, negatively contributed to VALUE CREATION in 11 instances (irrespective of whether the total VALUE CREATION was negative or not). For the statistical analysis, a constant is added to all values to ensure they are strictly positive, addressing the issue of the wide range of numbers in the sample. This adjustment is essential for stabilizing the regression analysis on the normal scale and for enabling the logarithmic transformation. Following this, the logarithmic transformation is applied to MULTIPLE EXPANSION to address the significant variance in the data, which arises from the diverse sizes of the 68 PORTFOLIO COMPANIES and their associated VALUE CREATION. This approach helps compress the large differences in magnitude, improving numerical stability and ensuring that the regression analysis produces parameter estimates that accurately reflect the underlying data relationships.*

4.1.2 INDEPENDENT VARIABLES

LSE CapEx, i.e. late-stage expansion capital expenditures[12], refer to investments in tangible assets made in excess of depreciation in the year of the GP's EXIT. The information was evaluated and collected as a binary variable based on the available financial information. A value of 1 was assigned when a company showed LSE CAPEX and 0 otherwise. Hypothesis 1 is upheld if the coefficient on this variable is significantly positive, $\beta_1 > 0$.

The second independent variable, LS R&D, i.e., late-stage research and development expenditures refer to investments in intangible assets made in excess of depreciation in the year of the GP's Exit. The information was evaluated and collected as a binary variable based on available financial information. A value of 1 was assigned when a

[12] *CAPEX is defined as the difference in the previous year's tangible assets minus the current year's tangible assets plus depreciation (expressed as a negative number). The result is typically a negative number—that is, an expense (though it can be positive, e.g., when assets are sold). Being negative, it contributes to Δ in NET DEBT and negatively to VALUE CREATION. Here, a distinction is made regarding the CAPEX required to continue a business in its current state (i.e., maintenance CapEx) and the CAPEX required to grow a business (expansion CAPEX). Richardson (2006) uses depreciation as a proxy for maintenance CAPEX. In essence, this definition presumes that a firm is investing exactly as much as it is depreciating—this expenditure allows it to maintain its business. Any investment beyond this must be for the company's growth; that is, expansion CAPEX. This view is somewhat simplistic, overlooking several factors, such as the industry, the firm's degree of professionalization, the imperative of enhanced productivity, and efficiency. Additionally, considerations such as the lifespan of the assets versus their depreciation timeline are pivotal—a point acknowledged by Richardson (2006), who asserts that this proxy is suitable for a company where the asset's usage aligns closely with its depreciation schedule. Nonetheless, as a feasible approach for the study, late-stage expansion CAPEX (LSE CapEx) will be defined in accordance with Richardson (2006) as CAPEX exceeding depreciation, but adding to his definition in the year of Exit (Late-Stage). To overcome a potential shortcoming of this definition, this study controls for the type of industry.*

PORTFOLIO COMPANY showed LS R&D[13] and 0 otherwise. Hypothesis 2 is upheld if the coefficient on this variable is significantly positive, $\beta_2 > 0$.

STREFOC, the third independent variable, comprises streamlining initiatives initiated by GPs throughout their HOLDING PERIOD. Building on Section 3.3, STREFOC can include purchasing non-core business units from corporate sellers and divesting business segments of PORTFOLIO COMPANIES. The argument is that streamlined businesses raise higher strategic interest at EXIT, raising the likelihood of selling the PORTFOLIO COMPANY at a higher EBITDA MULTIPLE, based on potential synergies strategic buyers factor in when deriving the purchase price. Based on the detailed information in the dataset, the indicator variable was set to 1 if the ACTION was identified. Hypothesis 3 will be upheld if such a coefficient is significantly positive, $\beta_3 > 0$.

The number of ADD-ONS[14] was individually collected for each PORTFOLIO COMPANY and recorded as an integer—that is, the number of ADD-ON acquisitions made by a GP with a particular PORTFOLIO COMPANY during the HOLDING PERIOD. For inclusion in the statistical tests supporting the regression analyses, it will be represented as a binary variable (1 if the ACTION was identified). Thereafter, it is used as an integer displaying the actual number of ADD-ONS made with a PORTFOLIO COMPANY. Hypothesis 4 will be upheld if such a coefficient is significantly positive, $\beta_4 > 0$.

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[13] The definition of LS R&D is highly comparable to that of LSE CAPEX. From a cash-flow perspective, LS R&D is the difference in the previous year's intangible assets minus the current year's intangible assets plus depreciation (a negative number). The result is typically a negative number—that is, an expense (though it could be positive, e.g., when assets are sold)—and as such negatively contributes to Δ in NET DEBT and VALUE CREATION. Similar to LSE CAPEX, but regarding investments in intangible assets in excess of deprecation, the data was evaluated following Richardson (2006).

[14] Secondary research was conducted using S&P Capital IQ and Mergermarket. Based on publicly available information as well as information in the dataset, the number of ADD-ONS was individually collected for each PORTFOLIO COMPANY

4.1.6 CONTROL VARIABLES

The regression analysis incorporates several control variables. Although the number of PARTICIPATIONS (68) is modest, it is deemed sufficient for the analysis. The control variables were carefully selected based on their relevance and a strong emphasis on causality. These variables are listed below.

As set out in Section 3.5.1, strategic buyers were documented, amongst others, by Bargeron et al. (2008), to pay premiums over GPs in TRANSACTIONS. Therefore, for the 68 PORTFOLIO COMPANIES in the sample, the type of EXIT was identified[15]. This information was recorded as a binary variable, with a value of 1 indicating that a STRATEGIC EXIT (sale to a strategic buyer) occurred.

To control for the potential effect of managerial change on MULTIPLE EXPANSION, MANAGER Δ, indicates whether the GP changed managers during the HOLDING PERIOD. Data were collected for all 68 PORTFOLIO COMPANIES and recorded as a binary variable, with a value of 1 indicating that a managerial change occurred.

As detailed in Section 3.5.3, market cycles have an important effect on MULTIPLES and have, therefore, constantly been cited as a source of MULTIPLE EXPANSION, e.g. by Achleitner et al. (2011). To control for market cycles, the quarterly market EBITDA MULTIPLES were recorded using the ARGOS INDEX and assigned to each TRANSACTION.

The regression analysis includes a set of indicator variables representing the regions of Asia, North America, Central & South America, Northern Europe, Southern Europe, and Western Europe. Each variable is binary, with a value of 1 if the observation is from the respective region and 0 if not. These indicators enable the model to account for regional differences. The regions were selected based on the distribution and size of the dataset as well as the activities of the GPs.

To account for potential currency-specific effects, the analysis incorporates a set of indicator variables representing the currencies USD, EUR, and CHF. Each variable is

[15] *For the avoidance of doubt: In addition to sales to GPs (as opposed to STRATEGIC EXITS), EXITS also included options such as IPOs.*

binary, with a value of 1 if the TRANSACTION is denominated in the respective currency and 0 if not.

To control for sector-specific effects, the analysis includes a set of indicator variables for different sectors: Consumer, Industrials/Engineering, Finance, Healthcare/MedTech/Pharma, and Other. Each indicator is binary, with a value of 1 if the observation falls within the respective sector and 0 if not.

Additionally, the analysis includes a vector of indicator variables representing different 5-year periods: 1995–1999, 2000–2004, 2005–2009, 2010–2014, and 2015–2019. The time periods (Quinquennials) were chosen in order to control for different time periods and economic cycles, despite a limited number of TRANSACTIONS. The individual indicator variables are assigned a value of 1 if the observation falls within the respective time period and 0 if not. These indicators allow the model to account for temporal effects across different periods.

The regression equation can be represented as:

$$\log\_\text{MULTIPLE EXPANSION} = \beta_0 + \beta_1 \text{LSE CAPEX} + \beta_2 \text{LS R\&D} + \beta_3 \text{STREFOC} + \beta_4 \text{ADD-ONS} + \beta_5 \text{ARGOS INDEX} + \beta_6 \text{STEXIT} + \beta_7 \text{MANAGER } \Delta + \beta_8 \text{Region} + \beta_9 \text{Currency} + \beta_{10} \text{Sector} + \beta_{11} \text{Quinquennial} + \epsilon$$

Where:

- β_0 is the intercept
- $\beta_1, \beta_2, ..., \beta_{11}$ are the coefficients for the respective variables
- ϵ is the error term

Based on the results, the study employs stepwise backward regression analysis. In each iteration, one variable is eliminated, ultimately producing a model that retains only the most significant predictors. This approach improves the model's predictive power and interpretability. The stepwise method is particularly well-suited to this study given the limited number of PARTICIPATIONS, ensuring that the model avoids overfitting and remains robust. By progressing from the most general to the most specific model, the analysis balances complexity with the inclusion of only the most impactful variables. A

threshold of $p < 0.2$ will guide variable selection, prioritizing parsimony without sacrificing explanatory power.

To conclude, the study will perform additional regression analyses incorporating interaction effects. This approach serves two purposes: to account for the combined impacts of predictor variables and to enhance the model's predictive power. Including interaction terms allows the analysis to capture complex relationships between variables, potentially revealing patterns that a standard model might overlook. This method strengthens the model's explanatory power and robustness while providing a more nuanced understanding of how specific combinations of ACTIONS affect MULTIPLE EXPANSION.

4.2 SAMPLE SELECTION AND DESCRIPTIVES

4.2.1 SAMPLE SELECTION

Most researchers have faced limited data availability, often relying on aggregated fund-level data, which limits in-depth analysis and can lead to contradictory findings. For example, Kaplan and Schoar (2005) and Phalippou and Gottschalg (2009) conclude that the performance of an average buyout lags behind market development, while Robinson et al. (2011), Harris et al. (2014), and Higson and Stucke (2012) find evidence of outperformance.

This research leverages deal-level data, relying on confidential information from four different GPs and covering five complete funds over their full lifespans. The data is anonymized, without referring to specific funds or PORTFOLIO COMPANIES. The dataset tracks the individual ACTIONS of the GPs and does not involve any selection of individual TRANSACTIONS by the author. It includes 68 PARTICIPATIONS in PORTFOLIO COMPANIES acquired and divested by these GPs.

While only few studies, such as Braun et al. (2017), benefit from larger deal-level samples—spanning investments by 865 buyout funds managed by 269 GPs. Yet, the data of Braun et al. (2017) is limited to specific cash flow information. The dataset used

in this analysis offers a significant advantage due to its granularity. It provides detailed information for each PORTFOLIO COMPANY, including EBITDA, EBITDA MULTIPLE, and NET DEBT at ENTRY and EXIT, as well as the ACTIONS undertaken by GPs during the HOLDING PERIOD. Additionally, the dataset encompasses the complete funds of the GPs in the sample.

This level of detail is crucial for analyzing ACTIONS, mitigating selection bias, and addressing the completeness issues that have challenged previous analyses. The directly sourced and standardized deal-level data allows for an in-depth examination of ACTIONS for MULTIPLE EXPANSION, surpassing the analytical potential of broader but less detailed datasets, such as that used by Braun et al. (2017).

4.2.1 DESCRIPTIVES

All TRANSACTIONS in this dataset occurred between 1995 and 2019 at ENTRY, with the majority concentrated between 2005 and 2014, as displayed in Table 1. Considering the typical fund duration of up to 12 years and HOLDING PERIODS spanning from 4 to 6 years, as well as the confidential nature of the data, the dataset is remarkably current.

TABLE 1: ENTRY TRANSACTIONS BY QUINQUENNIUM

By quinquennium

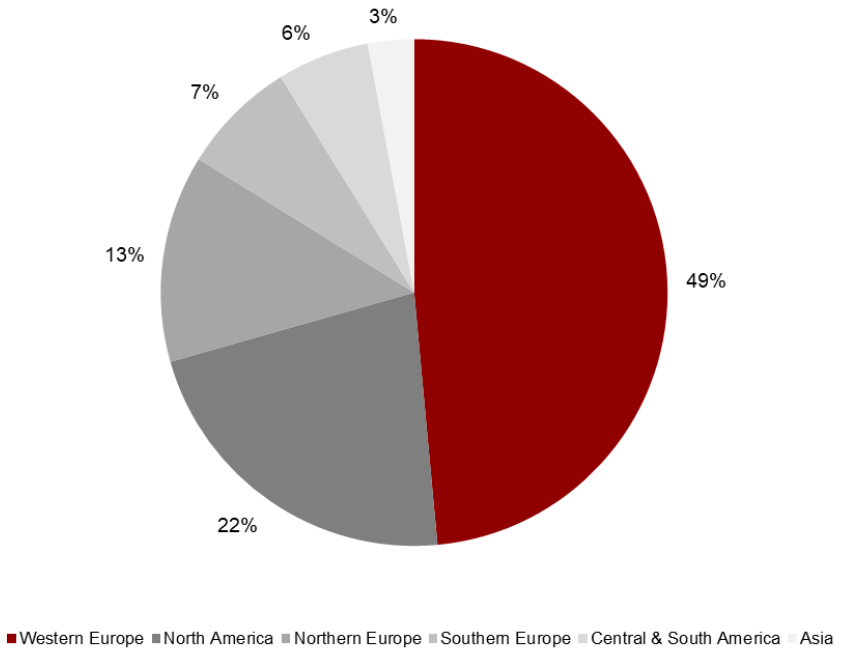
	# of deals	in %
1995-1999	2	2.9%
2000-2004	5	7.4%
2005-2009	38	55.9%
2010-2014	22	32.4%
2015-2019	1	1.5%
	68	100.0%

Source: Own figure/analysis

By comparison, the deal-level dataset used by Braun et al. (2017) contains TRANSACTIONS from 1974 to 2012, while Kaplan and Schoar (2005) focus on TRANSACTIONS from 1980 to 2001[16].

The dataset has an international scope, encompassing TRANSACTIONS worldwide, with Western Europe, North America, and Northern Europe being the most-represented regions, as shown in Figure 15. This distribution aligns closely with other studies and reflects the activity levels in some of the world's most prominent private equity markets.

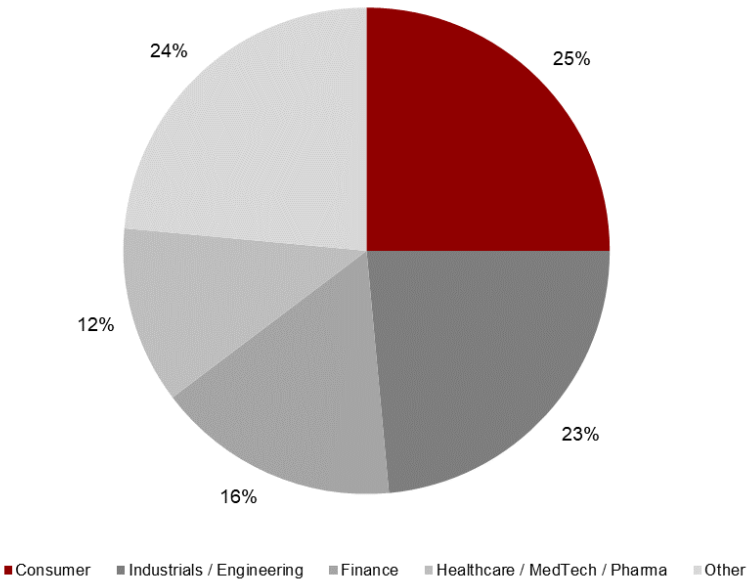
FIGURE 15: TRANSACTIONS BY REGION (DATASET)



Source: Own figure/analysis

[16] *For clarity, the dataset excludes attempted TRANSACTIONS that were not completed, regardless of the reason. This approach is consistent, as only completed TRANSACTIONS result in PORTFOLIO COMPANIES, which are then included in the funds' records.*

FIGURE 16: TRANSACTIONS BY SECTOR (DATASET)



Source: Own figure/analysis

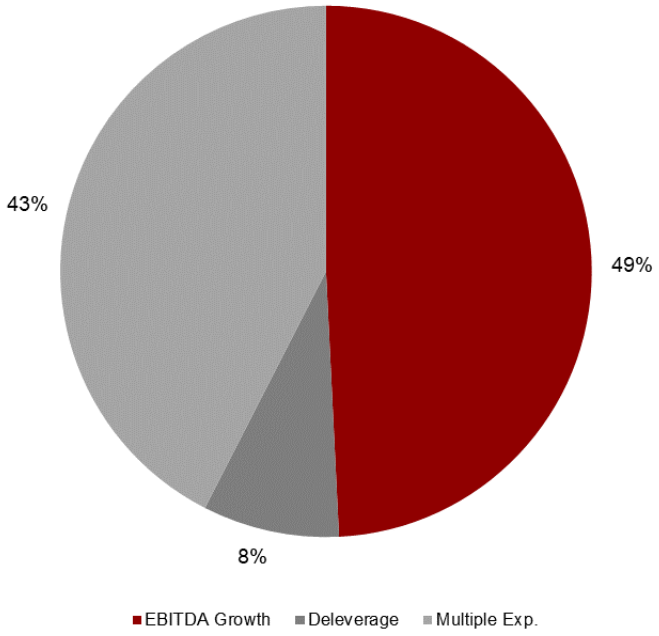
The dataset contains a broad range of sectors, with Consumer, Industrials/Engineering, Finance, and Healthcare/Med-Tech/Pharma predominating, as displayed in Figure 16. Both regions and target industries are the direct result of the focus of the funds. According to Kaplan and Schoar (2005), any fund with more than 60% of its investments in a single industry is classified as focused, which is not the case in the sample. As all four GPs follow a generalist approach, the distribution of the PORTFOLIO COMPANIES across sectors and regions can be considered representative of the private equity industry. Kaplan and Schoar (2005) categorizes funds into the biotech, communications and media, computer hardware, computer software and services, consumer-related, industrial/energy, internet, medical/health, semiconductors, and other electronics sectors. This study uses a more general yet still precise classification to avoid drastically reducing the number of TRANSACTIONS per sector.

The funds collectively achieved a total VALUE CREATION of EUR 15.7 billion, primarily driven by EBITDA GROWTH and MULTIPLE EXPANSION, with DELEVERAGE contributing to a lesser extent, as displayed in Figure 17. The dataset is representative and in line

with recent market trends highlighted in the Bain Global Private Equity reports (Bain Global, 2020, 2023), displayed in Figure 18, which indicate that, since 2010, MULTIPLE EXPANSION has contributed to VALUE CREATION on par with EBITDA GROWTH.

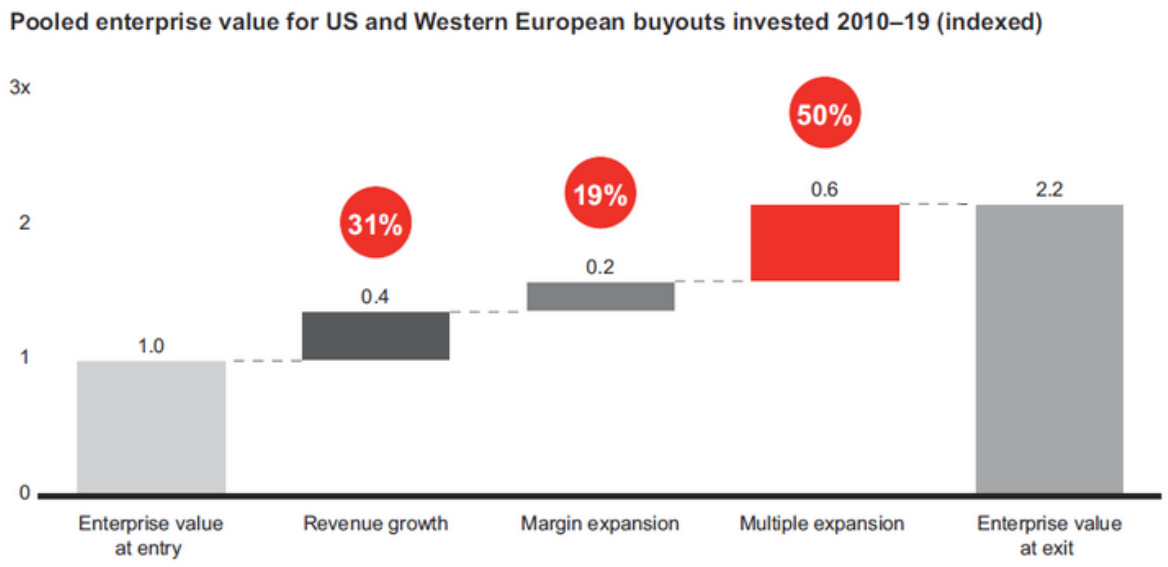
It is important to note that this calculation is based on ENTERPRISE VALUE and, by definition, excludes DELEVERAGE. A more recent analysis by Bain shows an increasing share of MULTIPLE EXPANSION in VALUE CREATION, rising from 53% in TRANSACTIONS EXITED between 2011 and 2016 to 58% for those EXITED between 2017 and 2022, displayed in Figure 19. This trend is supported by more recent studies, such as Cohn et al. (2022), which highlight that GPs create value by easing financing constraints for firms with strong investment opportunities and enhancing the performance of underperforming firms, while financial engineering (DELEVERAGE) plays a limited role.

FIGURE 17: VALUE CREATION BY TYPE (DATASET)



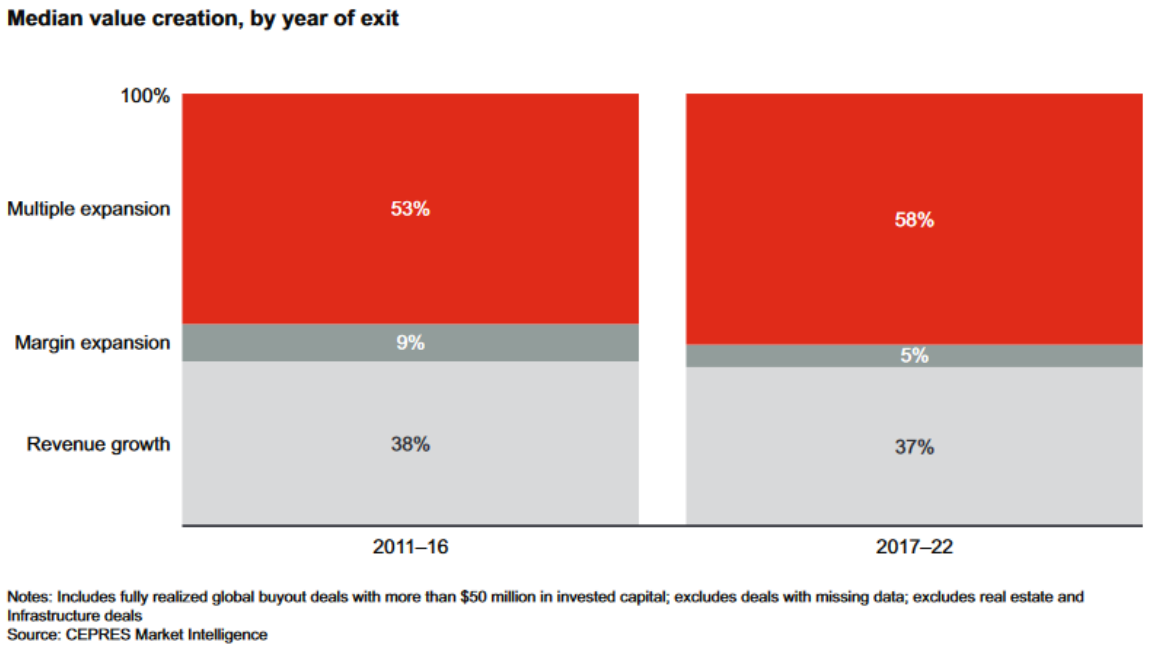
Source: Own figure/analysis

FIGURE 18: POOLED ENTERPRISE VALUE CREATION, 2010–2019



Source: Bain Global Private Equity Report 2020

FIGURE 19: MEDIAN ENTERPRISE VALUE CREATION BY YEAR OF EXIT



Source: Bain Global Private Equity Report 2023

The studies referred to offer an accurate and detailed view of the private equity industry, as collected by professional industry participants, and affirm the reliability of the database used in this study.

To conclude, the mean and median MULTIPLE EXPANSION reached by GPs with the PORTFOLIO COMPANIES in the dataset are EUR 90.6m and EUR 11.9m. The average HOLDING PERIOD was 5.2 years.

Table 2 gives an overview of the number of ACTIONS recorded in the sample. As displayed, LSE CAPEX was recorded at 30 PORTFOLIO COMPANIES, LS R&D at 15, STREFOC at 36, and ADD-ONS at 29. At three PORTFOLIO COMPANIES, all four variables occurred together. The most common combination of three variables occurred with LSE CAPEX, STREFOC, and ADD-ONS, which co-occurred in 15 instances. LS R&D and STREFOC occurred jointly at 10 PORTFOLIO COMPANIES.

TABLE 2: COMBINATIONS OF ACTIONS APPLIED TO INDIVIDUAL PORTFOLIO COMPANIES

	Total	All four	Three	Three	Three	Three	Two	Two	Two	Two
LSE CapEx	30	3	5	3	15		7	19		
LS R&D	15	3	5	3		5	7			10
StRefoc	36	3	5		15	5			21	10
Add-Ons	29	3		3	15	5		19	21	

Source: Own figure/analysis

4.3 UNIVARIATE TESTS

This section presents the results of the statistical tests of the validity of each of the four hypotheses. The tests consist of a two-sample t-test to determine whether there is a statistically significant difference in the means of MULTIPLE EXPANSION between a subsample of PORTFOLIO COMPANIES subject to a specific ACTION and the subsample without. The Wilcoxon Rank-Sum Test assesses whether the subsample subject to the ACTION demonstrated consistently higher values of MULTIPLE EXPANSION.

This non-parametric test, which does not assume a normal distribution, is useful for ordinal or continuous data that does not meet the assumptions of parametric tests. Subsequently, the median test, a non-parametric method used to compare group medians, is applied to the two subsamples. The uncorrected chi-square p-value

quantifies the significance of the difference in the distribution of observations above and below the median for MULTIPLE EXPANSION.

The results are displayed in Table 3.

TABLE 3: RESULTS OF UNIVARIATE TESTS

	Mean With Action	Mean Without Action	Difference in Means	Standard Error	T-Test p-value	Wilcoxon Rank-Sum p-value	Uncorrected Chi-Square p-value
Multiple Expansion							
LSE CapEx	283,061	117,540	165,522	70,619	0.011*		
LS R&D	268,008	168,646	99,362	87,161	0.129		
StRefoc	242,046	132,646	109,400	71,865	0.066*		
Add-Ons	296,524	111,773	184,750	70,200	0.005**		
Log of Multiple Expansion							
LSE CapEx	12.070	11.650	0.420	0.143	0.002**	0.020*	0.051
LS R&D	11.900	11.810	0.090	0.182	0.326	0.520	0.380
StRefoc	11.960	11.690	0.270	0.147	0.036*	0.113	0.331
Add-Ons	12.140	11.610	0.530	0.138	0.000***	0.002**	0.007**

Source: Own figure/analysis

*Note: Significance at the 1%, 5%, and 10% levels is indicated by ***, **, and *, respectively.*

4.3.1 TWO-SAMPLE T-TEST, WILCOXON RANK-SUM TEST, AND MEDIAN TEST FOR MULTIPLE EXPANSION BY LSE CAPEX

Table 3 reveals both for MULTIPLE EXPANSION and the log of MULTIPLE EXPANSION a significant economic impact and difference between the means with LSE CAPEX and without LSE CAPEX. In both cases, the mean MULTIPLE EXPANSION in the group containing the ACTION is higher. Specifically, the *p*-values for MULTIPLE EXPANSION (0.011) and the log of MULTIPLE EXPANSION (0.002) indicate that the mean MULTIPLE EXPANSION for subsamples containing LSE CAPEX is significantly higher than that for the subsamples without the ACTION at the 10% and 5% significance levels, respectively. The analysis strongly supports Hypothesis 1, indicating that LSE CAPEX has a significant positive effect on MULTIPLE EXPANSION.

The substantial difference in means for MULTIPLE EXPANSION suggests considerable variability within the groups (which also holds true for the other IVs), making the log of MULTIPLE EXPANSION a more suitable metric for further analysis in due course of this dissertation.

The Wilcoxon rank-sum shows a *p*-value (0.020) at the significance level of 10%, indicating a statistically significant higher MULTIPLE EXPANSION. The negative z-value confirms that the group without the ACTION has a lower log of MULTIPLE EXPANSION than the one with LSE CAPEX. This further supports Hypothesis 1, which posits that LSE CAPEX has a significant positive effect on MULTIPLE EXPANSION ($\beta_1 > 0$).

The median test was performed to assess whether there is a significant difference in the median values of the log of MULTIPLE EXPANSION. The uncorrected chi-square test yields a *p*-value of 0.051. The continuity-corrected chi-square test gives a *p*-value of 0.087. These results suggest that there is evidence to reject the null hypothesis, indicating that the medians of MULTIPLE EXPANSION differ between the two LSE CAPEX groups.

Collectively, the analyses provide robust evidence of a significant difference in the distributions of MULTIPLE EXPANSION, and even more so for the log of MULTIPLE EXPANSION, between the two groups. These findings support Hypothesis 1, affirming that LSE CAPEX has a significant positive effect on MULTIPLE EXPANSION ($\beta_1 > 0$).

4.3.2 TWO-SAMPLE T-TEST RESULTS, WILCOXON RANK-SUM TEST, AND MEDIAN TEST FOR MULTIPLE EXPANSION BY LS R&D

The analysis, displayed in Table 3, reveals that the *p*-value for MULTIPLE EXPANSION and the *p*-value for the log-transformed both exceed the 10% significance threshold. These results indicate no statistically significant difference in the means of MULTIPLE EXPANSION between the two groups. Furthermore, wide confidence intervals and the observed mean differences fail to support Hypothesis 2, which proposes that LS R&D has a significant positive effect on MULTIPLE EXPANSION ($\beta_2 > 0$).

The *p*-value of 0.520 of the Wilcoxon Rank-Sum test, being greater than the 10% significance threshold, indicates no statistically significant difference in the distributions of the log of MULTIPLE EXPANSION between the two groups. Additionally, the rank sums are close to their expected values, suggesting that the two distributions are similar.

Both the Pearson chi-square test (p = 0.380) and the continuity-corrected chi-square test (p = 0.559) confirm no statistically significant differences in the medians of the log of MULTIPLE EXPANSION between the two groups. Furthermore, the proportion of values exceeding the median is consistent across the groups, reinforcing the absence of significant differences.

Collectively, these results show no statistically significant differences in the means, distributions, or medians of MULTIPLE EXPANSION between the groups. The evidence suggests that LS R&D does not have a significant impact on MULTIPLE EXPANSION in this sample, contradicting Hypothesis 2.

4.3.3 TWO-SAMPLE T-TEST, WILCOXON RANK-SUM TEST, AND MEDIAN TEST FOR MULTIPLE EXPANSION BY STREFOC

Displayed in Table 3, the p-values for MULTIPLE EXPANSION and for the log-transformed MULTIPLE EXPANSION are significant at the 10% level indicating a statistically significant difference, and supporting Hypothesis 3.

However, additional analyses yielded mixed results. The Wilcoxon rank-sum test, with a p-value of 0.113, indicates no statistically significant difference in the distributions of the log of MULTIPLE EXPANSION between the groups. The rank sums align with their expected values, suggesting that the distributions are similar.

A median test using both the Pearson chi-square (p = 0.331) and continuity-corrected chi-square (p = 0.466) indicates no statistically significant difference in the medians of the log of MULTIPLE EXPANSION between the groups. Furthermore, the proportion of values exceeding the median remains consistent across the groups, further supporting the lack of a significant median difference.

Taken together, these results fail to consistently demonstrate statistically significant differences in the means, distributions, or medians of MULTIPLE EXPANSION between the groups with the ACTION STREFOC and without. Consequently, the evidence does not support Hypothesis 3, which posits that STREFOC has a significant positive effect on MULTIPLE EXPANSION ($\beta_3 > 0$).

4.3.4 Two-sample t-test, Wilcoxon rank-sum test, and median test for Multiple Expansion by Add-Ons

The two-sample t-test was performed to compare the means of Multiple Expansion between two groups defined by Add-Ons. For this initial analysis, Add-Ons were evaluated as a binary variable.

As shown in Table 3, the *p*-values of 0.005 for Multiple Expansion and 0.000 for its log-transformed counterpart at the 5% and 1% levels, respectively, indicate a highly significant difference in the means between the two groups. The negative t-values from both tests confirm that the subsamples with Add-Ons have higher Multiple Expansion. These results support Hypothesis 4, which posits that Add-Ons have a significant positive effect on Multiple Expansion ($\beta_4 > 0$).

The Wilcoxon rank-sum test, with a *p*-value of 0.002, indicates a statistically significant difference in the distributions of the log of Multiple Expansion between the groups. The rank sums indicate that Group 0 without the Action generally exhibits lower Multiple Expansion than Group 1.

The median test results corroborate these findings. The Pearson chi-square test ($p = 0.007$) and the continuity-corrected chi-square test ($p = 0.014$) both indicate statistically significant differences in the medians of the log of Multiple Expansion between the groups. The contingency table further shows a higher proportion of values exceeding the median in Group 1 with the Action compared to Group 0 without.

Collectively, these analyses consistently demonstrate significant differences in the means, distributions, and medians of Multiple Expansion across the two groups. Group 0 (no Add-Ons) consistently exhibits lower Multiple Expansion than Group 1 (one or more Add-Ons). These results strongly support the conclusion that Add-Ons are associated with higher Multiple Expansion, affirming Hypothesis 4.

4.4 SUMMARY

Building on Chapter 3, Chapter 4 has expanded in detail on the variables and controls to be used in the following regression:

$$\log\_\text{MULTIPLE EXPANSION} = \beta_0 + \beta_1 \text{LSE CAPEX} + \beta_2 \text{LS R\&D} + \beta_3 \text{STREFOC} + \beta_4 \text{ADD-ONS} + \beta_5 \text{ARGOS INDEX} + \beta_6 \text{STEXIT} + \beta_7 \text{MANAGER } \Delta + \beta_8 \text{Region} + \beta_9 \text{Currency} + \beta_{10} \text{Sector} + \beta_{11} \text{Quinquennial} + \epsilon$$

Before conducting the regression analysis in Chapter 5, the sample's characteristics were described in detail. This included an examination of the quinquennials as reference in time of the TRANSACTIONS, comparisons with other sources, and analyses of the regions and sectors. Additionally, the composition of VALUE CREATION (EBITDA GROWTH, DELEVERAGE and MULTIPLE EXPANSION) was assessed and compared to other studies. The comparisons highlight the sample's relevance, depth, accuracy, and representativeness, particularly in the context of current market dynamics.

Furthermore, prior to the regression analyses, statistical tests were conducted supporting Hypotheses 1 and 4, while not finding evidence for Hypotheses 2 and 3.

5 REGRESSION ANALYSIS

Based on the positive findings in Chapter 4, particularly in support of Hypotheses 1 and 4, the study proceeds with regression analysis using the logarithm of MULTIPLE EXPANSION to further find evidence in support of the hypotheses.

The general form of the regression equation is:

$DV = \beta_0 + \beta_1 \text{LSE CAPEX} + \beta_2 \text{LS R\&D} + \beta_3 \text{STREFOC} + \beta_4 \text{ADD-ONS} + \text{Controls} + \varepsilon$

Where:

- *DV* represents the dependent variable, MULTIPLE EXPANSION.
- β_0 is the intercept
- β_1, β_2, β_3, and β_4 represent the regression coefficients for the independent variables
- ϵ represents the error term

The regression analyses commence with a basic regression model (Model 1), where MULTIPLE EXPANSION (DV) is tested against LSE CAPEX, LS R&D, STREFOC, and ADD-ONS. In Model 2, the Control Variables specified in Sections 3.5 and 4.1.6 are included in the regression. To mitigate the low number of PARTICIPATIONS relative to the number of control variables, Model 3 employs a backward stepwise regression, iteratively removing less relevant variables to produce a reduced model that improves explanatory power and predictive accuracy. To conclude, Models 4 and 5 incorporate interaction effects: LS R&D × STREFOC (Model 4) and LSE CAPEX × ADD-ONS vs. LS R&D × STREFOC (Model 5).

The corresponding hypotheses will be upheld if the respective coefficient is significantly positive. This will provide insights into the relationship between the specified independent and control variables and the DV, MULTIPLE EXPANSION.

5.1 OVERVIEW OF REGRESSION RESULTS

The following table provides an overview of the regression analyses to be explained in the subsequent sections.

TABLE 4: OVERVIEW OF REGRESSION RESULTS

	Model 1: Basic	Model 2: With controls	Model 3: Stepwise	Model 4: Interaction Effects	Model 5: Interaction Effects II
LSE CapEx	0.320**	0.444**	0.467***	0.448***	
	(0.138)	(0.206)	(0.155)	(0.149)	
LS R&D	0.088	0.171	0.169		
	(0.161)	(0.235)	(0.169)		
StRefoc	0.069	0.044	-0.015		
	(0.141)	(0.225)	(0.144)		
Add-Ons	0.068***	0.059**	0.662***	0.053**	
	(0.020)	(0.027)	(0.210)	(0.208)	
LsR&D x StRefoc				0.395*	0.352*
				(0.199)	(0.179)
LsE CapEx x Add-Ons					0.131***
					(0.239)
Argos Index		-0.008			
		(0.119)			
Manager Δ		-0.043			
		(0.207)			
Strategic Exit (StExit)		0.010			
		(0.202)			
Sector: Industrials		-0.442	-0.419**	-0.458**	-0.327**
		(0.297)	(0.177)	(0.174)	(0.153)
Sector: Healthcare		-0.374	-0.428*	-0.365	-0.331*
		(0.632)	(0.236)	(0.233)	(0.206)
Sector: Finance		0.071			
		(0.303)			
Sector: Other		0.064			
		(0.284)			
Region: North America		0.369		0.230	0.190
		(0.391)		(0.162)	(0.142)
Region: Northern Europe		0.391		0.274	
		(0.420)		(0.200)	
Region: Southern Europe		0.110			
		(0.457)			
Region: Western Europe		0.172			
		(0.390)			
Currency: EURk		-0.095			
		(0.302)			
Quinquennial (2005-2009)		-0.26			
		(0.711)			
Quinquennial (2010-2014)		-0.162			0.207
		(0.705)			(0.132)
Quinquennial (2015-2019)		-0.162			
		(0.984)			
Constant (_cons)	11.490***	11.707***	11.598***	11.506***	11.603***
	(0.110)	(1.182)	(0.119)	(0.114)	(0.095)
N	68	62	62	62	62
R-Squared	0.271	0.399	0.355	0.403	0.473
Adj. R-Squared	0.225	0.106	0.285	0.325	0.415
F-Statistic	5.860	1.360	5.050	5.200	8.210

Source: Own figure/analysis
*Note: This panel reports the coefficients. The standard error is displayed below in parentheses. Significance at the 1%, 5%, and 10% levels is indicated by ***,, **, and *, respectively.*

5.2 Basic regression model

The initial regression analysis examines the relationship between the logarithm of Multiple Expansion and the main independent variables: LSE CapEx, LS R&D, StRefoc, and Add-Ons.

The analysis confirms Hypotheses 1 and 4, while it fails to confirm 2 and 3: Hypothesis 1 expects a positive coefficient for LSE CapEx. The regression coefficient for LSE CapEx is 0.320 (p = 0.024), suggesting that the presence of the Action LSE CapEx is associated with a 32.0% increase in Multiple Expansion at the 5% significance level. The regression coefficient for Add-Ons is 0.068 (p = 0.001), revealing the expected positive coefficient in support of Hypothesis 4 at the 1% significance level. For LS R&D, the result is insignificant with a regression coefficient of 0.088 (p = 0.589). StRefoc is insignificant with a regression coefficient of 0.069 (p = 0.626). Both results fail to confirm Hypotheses 2 and 3.

As displayed in Table 4, the overall regression model is statistically significant ($F(3, 58) = 5.86$, p = 0.000), suggesting that the independent variables—LSE CapEx, LS R&D, StRefoc, and Add-Ons—collectively explain changes in Multiple Expansion. The model's R^2 value of 0.271 indicates that these predictors explain approximately 27.1% of the variability in Multiple Expansion. The intercept term (_cons) is 11.490 (p < 0.000), representing the estimated value of the log of Multiple Expansion when all independent variables are zero.

In summary, while LSE CapEx and Add-Ons significantly influence Multiple Expansion, LS R&D and StRefoc do not show significant effects in this analysis. Consequently, the study advances to a more complex regression model, incorporating the control variables described in Section 4.3.6 into the calculation.

5.3 Regression analysis applying control variables

The study proceeds by including the full set of control variables detailed in Sections 3.5 and 4.1.6. The resulting regression equation can be represented as:

log_MULTIPLE EXPANSION = β_0 + β_1LSE CAPEX + β_2LS R&D + β_3STREFOC + β_4ADD-ONS + β_5ARGOS INDEX + β_6STEXIT + β_7MANAGER Δ + β_8Region + β_9Currency + β_{10}Sector + β_{11}Quinquennial + ϵ

Concerning the hypotheses, the analyses reveal results similar to Model 1: Hypotheses 1 and 4 are confirmed, while 2 and 3 are rejected. The regression coefficient for LSE CAPEX is 0.444 (p = 0.038). This supports Hypothesis 1, indicating that the presence of the ACTION LSE CAPEX has a significant positive effect on MULTIPLE EXPANSION. For Hypothesis 4, the regression coefficient for ADD-ONS is 0.059 (p = 0.035). This equally supports the rejection of the null hypothesis and confirms that ADD-ONS have a significant positive effect on MULTIPLE EXPANSION ($\beta_4 > 0$). The regression coefficient for LS R&D is 0.171 (p = 0.471). The regression coefficient for STREFOC is 0.044 (p = 0.847). Both results are statistically insignificant.

ARGOS INDEX, STRATEGIC EXIT, MANAGER Δ have non-significant coefficients ($p > 0.05$), indicating that they do not significantly influence MULTIPLE EXPANSION in this model. Notably, none of these theoretically motivated control variables appear to be relevant in the sample. The non-significance of the ARGOS INDEX challenges the prevailing narrative that attributes MULTIPLE EXPANSION to market cyclicality. Similarly, STRATEGIC EXITS do not explain MULTIPLE EXPANSION in this sample, indicating that the premiums paid by strategic buyers in acquisitions are not a relevant cause of MULTIPLE EXPANSION. MANAGER Δ also does not explain MULTIPLE EXPANSION, indicating that the increased strategic value and Δ in growth profile attributed to PORTFOLIO COMPANIES at EXIT are not driven by MANAGER Δ.

None of the regional variables (Asia, North America, Northern Europe, Southern Europe, Western Europe) exhibit statistically significant coefficients. Given the diverse locations of the TRANSACTIONS, the exclusion of region as an influencing factor strengthens the robustness of the analysis. The EURk variable shows a non-significant coefficient ($p > 0.05$), indicating that currency denomination does not significantly affect MULTIPLE EXPANSION either. The Finance, Healthcare, Industrials, and other sector dummy variables do not demonstrate statistically significant coefficients, suggesting that sector classification does not significantly influence MULTIPLE EXPANSION. The

dummy variables for the different 5-year periods do not demonstrate statistically significant results, suggesting that the Quinquennials do not significantly influence MULTIPLE EXPANSION and indicating that the period in time of investment does not significantly impact MULTIPLE EXPANSION.

In comparison to Model 1, Model 2 is not statistically significant ($F(3, 58) = 1.36$, $p = 0.197$), indicating that the predictors, as a group, do not significantly explain the variation in MULTIPLE EXPANSION. While the R^2 value of 0.399 suggests that 39.9% of the variance in MULTIPLE EXPANSION is explained by the predictors, the lack of statistical significance undermines confidence in the model's overall explanatory power.

The model supports Hypotheses 1 and 4 concerning the positive influence of the ACTIONS LSE CAPEX and ADD-ONS on MULTIPLE EXPANSION. However, the non-significant coefficients for LS R&D and STREFOC require further investigation. To enhance the model's predictive accuracy, as a next step, stepwise regression is performed.

5.4 STEPWISE REGRESSION ANALYSIS

To address concerns about the relatively low number of PARTICIPATIONS and the large number of independent variables, a backward stepwise regression was conducted. Hereby, the risk of insufficient degrees of freedom is mitigated, while the model is refined by retaining only the most impactful predictors, thereby enhancing its predictive accuracy.

This method iteratively removes the least relevant variables, ultimately leaving a reduced set that meaningfully explains the variation in the DV. By systematically eliminating statistically insignificant variables, backward stepwise regression increases the degrees of freedom, reduces noise from less impactful factors, and improves the model's predictive power. This process enhances the reliability of the model and facilitates clearer interpretations of the relationships between the remaining variables, focusing on the key drivers of the outcome. As a result, the four predictor variables—LSE CAPEX, LS R&D, STREFOC, and ADD-ONS—were retained throughout the analysis.

The procedure used a significance threshold of $p < 0.2$. The stepwise procedure eliminated several non-significant variables, yielding a final model with six predictors. Notably, all of the theoretically motivated controls were removed, and several categorical variables were excluded due to their lack of significant contribution of explaining variation in MULTIPLE EXPANSION.

Following the stepwise regression analysis, the following conclusions can be drawn with regard to the hypotheses: Across Models 1 – 3, Hypothesis 1, LSE CAPEX has a significant positive effect on MULTIPLE EXPANSION ($\beta_1 > 0$) and Hypothesis 4, ADD-ONS have a significant positive effect on MULTIPLE EXPANSION ($\beta_4 > 0$) are confirmed, both at the 1% significance level in Model 3. Instead, Hypothesis 2, LS R&D, has a significant positive effect on MULTIPLE EXPANSION ($\beta 2 > 0$), and Hypothesis 3, STREFOC, has a significant positive effect on MULTIPLE EXPANSION ($\beta 3 > 0$), are both not confirmed.

As in Model 2, none of the theoretically motivated controls proves to be significant. In addition, all other controls are eliminated during the backward stepwise regression, with the exception of two sectors: Healthcare and Industrials. In Model 3, the Healthcare sector remains significant (coefficient: -0.428 ($p = 0.076$)), suggesting that the TRANSACTIONS in this sector tend to exhibit slightly lower MULTIPLE EXPANSION. Similarly, the Industrials sector remains significant (coefficient: -0.419, $p = 0.021$), also showing slightly lower MULTIPLE EXPANSION.

As shown in Table 4, the model's significance is confirmed by the F-statistic ($F(3, 58) = 5.05$, $p = 0.000$), which indicates that the independent variables collectively explain a significant portion of the variation in the log of MULTIPLE EXPANSION. Specifically, the R^2 value of 0.355 demonstrates that 35.5% of the variability in the DV is explained by the model, while the adjusted R^2 value, accounting for the number of predictors, remains consistent at 0.285.

Based on the statistical tests (Section 4.3) and regression analysis (Sections 5.2– 5.4), Hypotheses 1 and 4 are confirmed. Their implications are discussed in detail in Chapter 6. Before moving on to the discussion, this study tests the interaction effects to determine whether the model can be refined and particularly whether LS R&D and

StRefoc can be shown to produce statistically significant results in favor of Hypotheses 2 and 3 in combination with other variables.

5.5 Stepwise regression analysis with interaction effects

As a theoretical basis for incorporating interaction effects, the dataset was analyzed for combinations of the four predictor variables: LSE CapEx, LS R&D, StRefoc, and Add-Ons. As set out in Table 1, LSE CapEx was recorded at 30 Portfolio Companies, LS R&D at 15, StRefoc at 36, and Add-Ons at 29. At three Portfolio Companies, all four variables occurred together. The most common combination of three variables occurred with LSE CapEx, StRefoc, and Add-Ons, which co-occurred in 15 instances. LS R&D and StRefoc occurred jointly at 10 Portfolio Companies, providing a basis for further analyses, as the two corresponding hypotheses—Hypotheses 2 and 3—were not confirmed in the stepwise backward regression in Section 5.3.

In principle, there is no logical tie between the predictor variables in the sense that the success of one of the Actions becomes more viable if it is accompanied by another Action, at least from a causal perspective. However, in an attempt to maximize Value Creation within a Portfolio Company, a GP might engage in various Actions at the same time. Based on the frequency of joint occurrences and in order to show the statistical relevance of LS R&D and StRefoc supporting Hypotheses 2 and 3, this study tests several interaction effects, uncovering the following two to be relevant:

LS R&D × StRefoc and LSE CapEx × Add-Ons vs. LS R&D × StRefoc.

5.5.1 Stepwise regression analysis with interaction effect LS R&D × StRefoc

The interaction effect between LS R&D and StRefoc was created and included in the regression. As in Section 5.4, a backward stepwise regression was performed, removing the least relevant variables using a significance threshold of $p < 0.2$. This process resulted in a refined set of variables that meaningfully explain the variation in the log of Multiple Expansion.

LSE CapEx (coefficient = 0.448, p = 0.004) and Add-Ons (coefficient = 0.053, p = 0.014) remain highly significant, confirming their positive effects on Multiple Expansion and supporting Hypotheses 1 and 4. The interaction term LS R&D × StRefoc (coefficient = 0.395, p = 0.052) is also significant, indicating a combined positive effect on Multiple Expansion. This supports Hypotheses 2 and 3; tested individually, the corresponding variables were non-significant.

Control variables, including Argos Index and StExit, remain non-significant, consistent with Section 5.4. Healthcare (coefficient = -0.365, p = 0.123) and Industrials (coefficient = -0.458, p = 0.011) show slightly lower Multiple Expansion. Additionally, North America (coefficient = 0.230, p = 0.160) and Northern Europe (coefficient = 0.274, p = 0.176) suggest higher Multiple Expansion compared to other regions.

The model is statistically significant ($F(3, 58) = 5.2$, p = 0.000), showing that the predictors collectively influence the log of Multiple Expansion. The adjusted R^2 of 0.325 indicates that the model explains 32.5% of the variance, slightly improving on the results in Section 5.4.

5.5.2. Stepwise Regression Analysis with interaction effects LS R&D × StRefoc and LSE CapEx × Add-Ons

Finally, the interaction effect of LSE CapEx and Add-Ons was aggregated in exchange for the individual variables to the regression.

Both interaction effects are highly relevant. LSE CapEx × Add-Ons has a significant positive effect on the log of Multiple Expansion (Coefficient = 0.131, $p < 0.001$) at the 1% significance level. Likewise, LS R&D × StRefoc has a significant positive effect on the log of Multiple Expansion (Coefficient = 0.352, p = 0.054) at the 10% level.

None of the theoretically motivated controls prove to be significant. After the stepwise regression at the threshold of $p < 0.2$, only a few controls remain relevant. In the Healthcare sector (coefficient: -0.331, p = 0.114), Transactions tend to exhibit slightly lower Multiple Expansion. Similarly, the Industrials sector remains significant (coefficient: -0.327, p = 0.037), showing a similar trend of lower Multiple Expansion.

Additionally, North America (coefficient: 0.190, p = 0.186) and the 2010–2014 quinquennial period (coefficient: 0.207, p = 0.121) are significant at the threshold of p < 0.2, suggesting that TRANSACTIONS in this region and over this time period tended to result in slightly higher MULTIPLE EXPANSION.

The final model has an adjusted R^2 of 0.415, which indicates a significant improvement in explaining the variability in MULTIPLE EXPANSION compared to the model without interaction effects (adjusted R^2 = 0.285) and shows greater accuracy than the previous model (adjusted R^2 = 0.325).

5.6 SUMMARY

LSE CapEx is statistically significant in all models, strongly confirming Hypothesis 1, that LSE CapEx has a significant positive effect on MULTIPLE EXPANSION. The coefficients range from 0.320 in Model 1 to 0.467 in Model 3, consistently indicating that the presence of the ACTION LSE Capex is associated with a 32.0% to 46.7% economically significant increase in MULTIPLE EXPANSION. In Model 4, the coefficient remains stable at 0.448.

Similarly, ADD-ONS are a significant ACTION across all models, strongly supporting Hypothesis 4. The coefficient is relatively small in Models 1 and 2 (0.068 and 0.059, respectively) but increases substantially in Model 3 to 0.662, indicating a stronger percentual increase associated with the presence of the ACTION with MULTIPLE EXPANSION when other variables are accounted for. In Models 4 the coefficient slightly decreases to 0.053, while remaining statistically significant at the 5% level.

With regards to the interaction effects, LSR&D X STREFOC is significant in Models 4 (0.395) and 5 (0.352) at the 10% level. The coefficients suggest a moderate contribution to MULTIPLE EXPANSION. When tested individually, neither ACTION demonstrated a significant positive effect on MULTIPLE EXPANSION, as proposed by Hypotheses 2 and 3. However, when combined, the presence of these ACTIONS was associated with economically significant increases in MULTIPLE EXPANSION of 39.5% and 35.2% in Models 4 and 5, respectively. LSE CAPEX X ADD-ONS is significant at the

1% level in Model 5 with a coefficient of 0.131. While the economic impact of LSE CapEx is stronger in Model 3, the standalone effect of Add-Ons (Model 3) is improved by a larger coefficient when the interaction effect is considered. Therefore, Model 5 absorbs some of the explanatory power of LSE CapEx, creating a synergistic effect that enhances its impact on Multiple Expansion. The model accounts for a larger portion of the variation in Multiple Expansion compared to Model 3, indicating that the interaction term captures specific relationships between variables that are otherwise omitted in Model 3.

None of the theoretically motivated controls are significant. Industrials show significant negative coefficients in Models 4 (-0.458) and 5 (-0.327). Healthcare is insignificant in Models 4 (-0.428) and 5 (-0.331). Regional variables (e.g., North America, Northern Europe) and Quinquennials are not statistically significant across models, indicating limited relevance for explaining Multiple Expansion in this dataset.

The R-squared values improve across models, from 0.271 in Model 1 to 0.473 in Model 5, indicating that including controls and interaction terms increases the explanatory power of the models. The adjusted R-squared also improves, reaching 0.415 in Model 5, which suggests the final model accounts for a meaningful portion of the variation in Multiple Expansion.

6 DISCUSSION/CONCLUSION

The following section provides a comprehensive summary of the study and its key findings, highlighting the implications for both academic researchers and industry professionals. It examines how the results contribute to existing knowledge and practice, offering valuable insights for further applications and studies. Additionally, this section addresses the study's limitations by offering a critical evaluation of the challenges encountered and the constraints that may affect the generalizability of the findings. The discussion then turns to potential avenues for future research, suggesting areas where additional investigation could further enhance understanding and contribute to the ongoing development of research on VALUE CREATION in Private Equity. These suggestions aim to inspire future studies that could build on the current research, exploring new dimensions and refining the approaches to MULTIPLE EXPANSION and VALUE CREATION in private equity.

6.1 OVERVIEW OF THE STUDY

The study commenced with a thorough review of the academic literature on private equity, with a particular focus on GP-led ACTIONS in PORTFOLIO COMPANIES aimed at VALUE CREATION, and MULTIPLE EXPANSION, the latter of which constitutes an empty space in the academic literature. This review did not simply critically review earlier studies but explored in detail how findings have evolved over time, as GPs widened their portfolio of ACTIONS applied at PORTFOLIO COMPANIES in a maturing industry.

The study identified key research directions and findings that have shaped the understanding of VALUE CREATION in private equity. Of note is the fact that early research (Scholes et al., 1990) identifies the use of external debt and its repayment (DELEVERAGE) as one of the primary sources of VALUE CREATION. Known as financial engineering, this ACTION involves financing acquisitions with large amounts of debt, which not only provides tax benefits during the repayment process but also minimizes the equity needed for the TRANSACTION. However, this ACTION has its downsides. A significant portion of the PORTFOLIO COMPANY'S free cash flows must be used to pay

down the debt throughout the HOLDING PERIOD, limiting the funds available for other growth initiatives and potentially overburdening the company.

In this context, asset stripping was a controversial ACTION in the early days of private equity. GPs sold off marketable assets of PORTFOLIO COMPANIES to generate cash. While this approach offered quick VALUE CREATION through DELEVERAGE, it was unsustainable and risky. Higher leasing or rental expenses resulting from sale and leaseback TRANSACTIONS weakened companies' resilience to economic downturns. Academic studies such as those by Jensen (1970) and Strömberg (2009) documented this practice and its association with bankruptcies.

Following the initial emphasis on DELEVERAGE as a key driver of VALUE CREATION, the academic literature shifted focus toward growth and operational improvements in private equity. Lichtenberg and Siegel (1989) were among the first to emphasize productivity gains in private equity-owned companies. Kaplan (1989) subsequently noted profitability improvements relative to industry benchmarks, while Smith (1990) similarly confirmed productivity growth as a contributor to VALUE CREATION. In the late 2000s, Pindur (2007) and Brigl et al. (2008) highlighted the growing importance of operational improvements, showing that private equity returns increasingly relied on revenue and margin growth rather than purely financial restructuring.

By the late 2010s, Lahmann et al. (2017) and Burth and Reißig-Thust (2019) identified operational improvements as standard practice in buyouts, highlighting the role of such ACTIONS in boosting company performance. Earlier, Vester (2011) had found that half of the VALUE CREATION in North American private equity deals stemmed from operational and strategic enhancements, establishing EBITDA GROWTH as the dominant component of VALUE CREATION at the time.

These findings were contextualized within an increasingly professionalized industry marked by growing AuM and a rising number of GPs, as discussed in Section 2.2. This context is crucial in explaining how intensifying competitive pressure drives GPs to adopt more sophisticated ACTIONS to secure successful returns. The study also underscores the necessity of understanding why, in a rapidly evolving industry, GPs constantly develop additional ACTIONS: older ACTIONS—particularly those involving high

debt loads and asset stripping, which were once effective and are supported by older academic literature—may now be insufficient and inadequate to achieve the desired financial returns.

The introduction also included a critical classification of ACTIONS validated by academic studies, as detailed in Section 2.6. These ACTIONS were systematically organized into a framework to demonstrate their individual and distinct impacts on financial statements, specifically the P&L, the balance sheet, and the cash flow statement. This classification aligns ACTIONS with MULTIPLE-BASED VALUATION, a widely recognized valuation methodology in the private equity industry. Using this framework, the study clearly differentiates ACTIONS by their influence on VALUE CREATION, categorizing them into actions aimed at influencing EBITDA GROWTH, DELEVERAGE, and MULTIPLE EXPANSION, with the latter being the primary focus.

This structured approach clarifies the effects of previously recognized VALUE CREATION mechanisms while also highlighting the specific ACTIONS taken in pursuit of MULTIPLE EXPANSION, which have been largely overlooked in prior research. Consequently, the study has concentrated on testing the validity of four hypotheses concerning specific ACTIONS that are purportedly initiated by GPs to achieve MULTIPLE EXPANSION for their PORTFOLIO COMPANIES.

Hypothesis 1 proposes a significant positive effect of LSE CAPEX on MULTIPLE EXPANSION. LSE CAPEX involves substantial cash outflows, which negatively impact DELEVERAGE. Regarding the P&L and potential EBITDA GROWTH, investments typically require a payback period of over 3 years, as stated by Yard (2000), which therefore extends beyond the EXIT. This suggests that GPs aim at MULTIPLE EXPANSION with LSE CAPEX, based on the understanding that GPs consistently aim to enhance EQUITY VALUE with every ACTION they undertake.

The same rationale applies to LS R&D, as explained in Section 3.2, with the distinction that LS R&D involves investments in intangible assets rather than tangible ones. Its characteristics remain identical: LS R&D reduces DELEVERAGE, and due to the long-term nature of such investments, no positive effects on EBITDA GROWTH are expected within the remaining HOLDING PERIOD. Consequently, GPs must be targeting MULTIPLE

EXPANSION through such ACTIONS. Accordingly, Hypothesis 2 proposes that LS R&D has a significant positive effect on MULTIPLE EXPANSION.

Earlier studies, including Barber and Goold (2007), emphasize how GPs create value by acquiring and refocusing non-core business units. Hypothesis 3 builds on this by proposing that STREFOC has a significant positive effect on MULTIPLE EXPANSION. It suggests that GPs create value through strategic realignment, attracting higher EBITDA MULTIPLES upon sale. Additionally, drawing on Biesinger (2020), it proposes that divestitures allow GPs to refocus PORTFOLIO COMPANIES, enhancing strategic appeal and achieving MULTIPLE EXPANSION by selling more streamlined and strategically aligned businesses.

ADD-ONS are widely used in private equity to build value by integrating smaller companies into a larger platform PORTFOLIO COMPANY. Although research confirms that GP-led TRANSACTIONS involving ADD-ONS outperform those without, primarily due to above-average EBITDA GROWTH, and benefit from MULTIPLE EXPANSION, the exact mechanisms behind their VALUE CREATION remain unclear, as noted by Hammer et al. (2022).

Hypothesis 4 proposes that ADD-ONS have a significant positive effect on MULTIPLE EXPANSION. Since smaller companies are typically valued at lower EBITDA MULTIPLES, they experience a valuation uplift to the platform's EBITDA MULTIPLE on integration into the larger group. This is attributed to the stronger market position, improved economies of scale, and enhanced financial stability that come with being part of a larger entity. The study therefore proposes that the primary motive for ADD-ONS is MULTIPLE EXPANSION.

6.2 SUMMARY OF FINDINGS

The analytical part of this study involved statistical tests (Section 4.3), including the two-sample t-test, the Wilcoxon rank-sum test, and the median test, serving as the foundation for further analysis. The study then applied a basic regression analysis (Section 5.2), which was repeated with control variables (Section 5.3). Finally, a

stepwise backward regression was performed (Sections 5.4) to improve the model's predictive accuracy, resulting in a refined set of variables that best explain the variation in MULTIPLE EXPANSION. The regressions concluded with tests of interaction effects in section 5.5. To summarize the findings:

H_1: LSE CAPEX has a significant positive effect on MULTIPLE EXPANSION ($\beta_1 > 0$)

Hypothesis 1 was consistently confirmed across statistical tests in Section 4.3. and showed a significant positive effect in all regressions (Sections 5.2–5.4). In the stepwise regression (Section 5.4), the presence of LSE CAPEX corresponded to an increase in the log of MULTIPLE EXPANSION of 46.7%.

As discussed in Section 3.1, no prior academic research has directly linked LSE CAPEX to MULTIPLE EXPANSION. Earlier studies, such as Dean (1953) and Chambers et al. (1999), examined CAPEX policies, focusing on optimal spending ratios and investment levels to achieve specific business objectives, from maintaining operations to driving growth. In the context of private equity, however, the discourse has centered on the structural constraints imposed on PORTFOLIO COMPANIES after the ENTRY of GPs. High debt levels and restrictive spending policies often limit CAPEX, with Lichtenberg and Siegel (1989) highlighting the potential risks of underinvestment in LBOs due to excessive debt.

If GPs are typically conservative with CAPEX, particularly toward the end of the HOLDING PERIOD, why would they permit significant LSE CAPEX, which does not immediately boost EBITDA GROWTH and reduces DELEVERAGE? The answer lies in the pursuit of MULTIPLE EXPANSION. By allowing LSE CAPEX just before EXIT, GPs aim to achieve a higher EBITDA MULTIPLE upon sale, enhancing VALUE CREATION through MULTIPLE EXPANSION rather than securing DELEVERAGE.

This hypothesis, now confirmed, is groundbreaking. It challenges the traditional view that GPs prioritize short-term gains and highlights a strategic shift toward investing in LSE CAPEX near EXIT to boost EBITDA MULTIPLES, even though PORTFOLIO COMPANIES only reap the benefits after the HOLDING PERIOD. This insight reshapes perceptions of

GP ACTIONS and addresses a critical gap in understanding the role of LSE CAPEX in driving MULTIPLE EXPANSION.

H_2: LS R&D has a significant positive effect on MULTIPLE EXPANSION ($\beta_2 > 0$)

Hypothesis 2 was not confirmed throughout Section 4.3, as all statistical tests showed no significance. It also remained insignificant across regressions (Sections 5.2–5.4). However, in Section 5.5, the interaction effect of LS R&D and STREFOC demonstrated a significant positive impact on MULTIPLE EXPANSION. The presence of the combined ACTIONS was accompanied by a 35.2% increase in MULTIPLE.

Capizzi et al. (2011) find that GP-led firms tend to possess more intangible assets, indicating higher R&D activity than non-GP-led firms. Cirillo et al. (2019) further reveal that, while family ownership typically reduces R&D investment, the involvement of GPs offsets this, increasing R&D spending. R&D, unlike CAPEX, has a clearer link to VALUE CREATION, with studies such as Battisti et al. (2019) highlighting the importance of innovation in building sustainable competitive advantages. However, the specific impact of R&D investments on value at EXIT remains poorly understood, leaving a gap in the current literature.

Despite the more favorable perception of GPs' involvement in R&D compared to CAPEX, the timing challenge persists. As Lerner et al. (2008) note, R&D expenses are long-term investments, with costs expensed immediately while benefits typically are not realized until years later, often beyond the HOLDING PERIOD.

This study anticipated similar results for LS R&D as for LSE CAPEX, but the findings did not support this hypothesis, potentially due to an insufficient sample size. Nevertheless, the significant interaction effect with STREFOC suggests that LS R&D is most effective when combined with strategic refocusing. This opens up avenues for further research into how these ACTIONS interact to drive MULTIPLE EXPANSION.

H_3: STREFOC has a significant positive effect on MULTIPLE EXPANSION ($\beta_3 > 0$)

The statistical tests did not consistently provide evidence of statistically significant differences in favor of Hypothesis 3. STREFOC remained insignificant throughout the

regressions in Sections 5.2–5.4. However, as noted above, the interaction effect of LS R&D and StRefoc, tested in Section 5.5, showed a significant positive effect on Multiple Expansion.

This result likewise may stem from the limited sample size. A larger dataset, particularly one that isolates spin-offs and divestitures for separate analysis, could provide more robust evidence for the effect of StRefoc. Given the frequent application of this strategy, further research could yield valuable insights into the Actions of GPs and offer a clearer understanding of whether StRefoc contributes to Multiple Expansion as a standalone Action. Such findings would enhance the understanding of Value Creation in private equity Transactions. Given the significant interaction effect with LS R&D, further research in this area appears particularly promising.

H_4: Add-Ons have a significant positive effect on Multiple Expansion ($\beta_4 > 0$)

Hypothesis 4 was supported by all statistical tests presented in Section 4. It also remained significantly positive across the regression analyses in Sections 5.2–5.4 In the stepwise regression analysis (Section 5.3), the presence of Add-Ons was associated with a 66.2% increase in the log of Multiple Expansion. With this, the analyses confirm that Add-Ons significantly positively impact Multiple Expansion, marking a new and important finding in private equity research. This result supports previous assumptions about the role of inorganic growth in Value Creation, now backed by concrete data and analysis to support those views. Private equity has long been associated with growth strategies involving acquisitions, where Add-Ons are integrated into a Portfolio Company.

As Gilligan and Galpin (2022) describe, this approach focuses on acquiring a platform company with strong internal capabilities and then adding smaller companies to create a more valuable, consolidated entity. While earlier studies such as those by Nikoskelainen and Wright (2007), Valkama et al. (2013), and Lahmann et al. (2017) have shown that Add-Ons contribute to Value Creation, it was not fully understood that this value is driven primarily through Multiple Expansion. Add-Ons not only contribute to overall growth but are directly tied to enhancing Multiple Expansion, with the effect growing stronger as more Add-Ons are integrated. This new evidence offers

a clearer understanding of how ADD-ONS drive VALUE CREATION in private equity, solidifying their role as a distinct and powerful ACTION.

In summary, through various statistical tests and ultimately via a backward stepwise regression at $p < 0.2$ thresholds, the study demonstrated that LSE CAPEX has a significant positive effect on MULTIPLE EXPANSION, confirming the validity of Hypothesis 1. In addition, for ADD-ONS, the study revealed a significant positive effect on MULTIPLE EXPANSION. For LS R&D and STREFOC, the study was initially not able to find significant positive effects in support of Hypotheses 2 and 3. However, when combined, the interaction effect of LS R&D and STREFOC was significant, indicating a positive effect on MULTIPLE EXPANSION, thus supporting Hypotheses 2 and 3.

6.3 THEORETICAL IMPLICATIONS

The results of this study provide a significant contribution to understanding how specific ACTIONS initiated by GPs drive VALUE CREATION through MULTIPLE EXPANSION.

The findings advocate for further analysis of MULTIPLE EXPANSION as a key research area within VALUE CREATION in private equity TRANSACTIONS. A particularly valuable finding was the disproof of the longstanding assumption that market swings are the primary cause of MULTIPLE EXPANSION. By using the ARGOS INDEX to account for market cyclicality, the study shows that market swings do not significantly impact MULTIPLE EXPANSION. Given that MULTIPLE EXPANSION has often been attributed to market timing, the findings of this study represent a departure from previous explanations. This finding is crucial because it positions MULTIPLE EXPANSION as a controllable element of VALUE CREATION, directly shaped by the ACTIONS of GPs rather than external forces. In addition, the non-significant results for the other theoretically motivated controls, namely MANAGER Δ and STRATEGIC EXITS, further bolster the notion that GP-initiated ACTIONS are the primary drivers of MULTIPLE EXPANSION.

The results highlight the importance of MULTIPLE EXPANSION as a central focus of academic inquiry in private equity TRANSACTION returns. They suggest that further exploration of MULTIPLE EXPANSION is needed, particularly in understanding which

additional ACTIONS GPs can implement to maximize returns. This study confirms the critical role of MULTIPLE EXPANSION, which has recently garnered increased attention in the academic literature. However, it advances the discussion by providing concrete evidence of specific ACTIONS that can be taken to achieve MULTIPLE EXPANSION.

A key contribution of this study is the confirmation that LSE CAPEX significantly contributes to MULTIPLE EXPANSION. Traditionally, GPs have been thought to limit CAPEX in general, and particularly late in the HOLDING PERIOD, given the expectation that investments do not immediately impact EBITDA GROWTH within the EXIT horizon, but lower DELEVERAGE. However, this study reveals a new finding: GPs can strategically use LSE CAPEX to enhance the EBITDA MULTIPLE at EXIT, even if the long-term benefits of these investments are realized only beyond the HOLDING PERIOD.

This finding counters the popular argument that GPs' ACTIONS are solely focused on short-term gains and immediate returns and thereby act against the long-term interest of the PORTFOLIO COMPANIES. It shows that GPs can strategically invest in LSE CAPEX near the EXIT to drive MULTIPLE EXPANSION, which not only enhances their VALUE CREATION but also leaves the PORTFOLIO COMPANIES in a stronger position. Contrary to previous criticisms that GPs leave companies underinvested, this approach demonstrates that these late-stage investments contribute to VALUE CREATION by generating financial returns.

In contrast, the analysis of LS R&D investments did not show them to have a significant positive impact on MULTIPLE EXPANSION when considered independently—nor did STREFOC. However, the study finds that the interaction effect between LS R&D and STREFOC is significant. As their combination causes VALUE CREATION through MULTIPLE EXPANSION, and there are no ties—or at least, no obvious ones—between the two, this insight opens up a promising area for future research. The interaction may suggest that PORTFOLIO COMPANIES that both engage in STREFOC and invest in LS R&D can position themselves more effectively for higher EBITDA MULTIPLES at EXIT. A potential explanation may be that the combined effect may stem from the strategic clarity that STREFOC provides, allowing the company to better leverage its LS R&D investments for future growth.

This study confirms the importance of ADD-ONS as a path for VALUE CREATION through MULTIPLE EXPANSION. ADD-ONS, where smaller companies are acquired and integrated into a larger PORTFOLIO COMPANY, have long been recognized as contributing to VALUE CREATION in private equity TRANSACTIONS. However, this study provides new evidence showing that ADD-ONS specifically drive MULTIPLE EXPANSION. While integrating smaller firms into a PORTFOLIO COMPANY increases scale and creates opportunities for savings through synergies (i.e., EBITDA GROWTH), this study confirms that ADD-ONS result in higher EBITDA MULTIPLES at EXIT. This occurs because ADD-ONS are typically acquired at lower EBITDA MULTIPLES than the initial (platform) PORTFOLIO COMPANY, and the larger, consolidated group PORTFOLIO COMPANY enjoys an even higher EBITDA MULTIPLE at EXIT. This finding aligns with previous literature, such as Nikoskelainen and Wright (2007) and Lahmann et al. (2017), who connected ADD-ONS to VALUE CREATION, but this research goes a step further by explicitly linking ADD-ONS to MULTIPLE EXPANSION.

6.4 MANAGERIAL IMPLICATIONS

The findings of this study carry important implications for both GPs and the managers of PORTFOLIO COMPANIES. For GPs, the evolving landscape of private equity and the intensifying competition demand a constant reassessment of ACTIONS to maintain a dynamic and flexible approach toward VALUE CREATION. The results of this study underline the importance of addressing all components of VALUE CREATION through distinct, well-coordinated ACTIONS. While EBITDA GROWTH and DELEVERAGE are commonly pursued with distinct ACTIONS, GPs should adopt comprehensive ACTIONS to achieve MULTIPLE EXPANSION too. This study's findings suggest that LSE CAPEX should not be regarded as unworthy or even detrimental to immediate returns. On the contrary, such investments can significantly enhance MULTIPLE EXPANSION. Thus, LSE CAPEX presents a good opportunity toward the end of the HOLDING PERIOD to sharpen strategic value & Δ in the growth profile of PORTFOLIO COMPANIES. LSE CAPEX can make PORTFOLIO COMPANIES more appealing to buyers, generating an appetite to pay higher EBITDA MULTIPLES. By forgoing part of DELEVERAGE in favor of investment, GPs

can drive MULTIPLE EXPANSION and ultimately achieve better returns at EXIT, while better positioning the PORTFOLIO COMPANY for long-term success. A GP's short-term return and sustainability are not in conflict at this point.

The interaction effect between STREFOC and LS R&D also offers a key insight for GPs. While these ACTIONS in isolation did not yield significant results, their combination proved effective in driving MULTIPLE EXPANSION. This suggests that GPs should look beyond singular ACTIONS and explore how they can work together to create value. When paired, STREFOC and LS R&D can highlight a PORTFOLIO COMPANY'S potential for innovation and long-term growth, making it more attractive to strategic buyers. GPs should therefore assess a PORTFOLIO COMPANY's operational and strategic positioning holistically, combining STREFOC and LS R&D to maximize EXIT valuations.

ADD-ONS, shown to significantly drive MULTIPLE EXPANSION, offer GPs another powerful tool for enhancing VALUE CREATION. Beyond contributing to EBITDA GROWTH, ADD-ONS consistently increase MULTIPLE EXPANSION at EXIT with each acquisition. For GPs, this study underscores the effectiveness of ADD-ONS and dedicated BUY & BUILD. Throughout the HOLDING PERIOD, it makes sense to actively seek acquisition targets that complement the PORTFOLIO COMPANY's capabilities and market activities. GPs with specialized expertise in particular industries or sectors can further capitalize on ADD-ONS tailored to specific market dynamics. Additionally, fragmented markets with low automation and high synergy potential provide optimal conditions for BUY & BUILD strategies, maximizing the impact of ADD-ONS on VALUE CREATION.

In summary, this study emphasizes the importance for GPs of adopting a multi-faceted approach to VALUE CREATION, incorporating ACTIONS for MULTIPLE EXPANSION. By leveraging LSE CAPEX, exploring synergies between STREFOC and LS R&D, and implementing ADD-ONS, GPs can generate value beyond EBITDA GROWTH and DELEVERAGE. Understanding these mechanisms allows GPs to make more informed strategic decisions, ultimately achieving higher EBITDA MULTIPLES at EXIT and delivering greater returns for investors.

For PORTFOLIO COMPANY managers, the study provides a clearer understanding of how VALUE CREATION works. It offers valuable insights into how GPs perceive VALUE

CREATION and how managers can prioritize ACTIONS to align with the interest of their owners—that is, the GPs—to maximize VALUE CREATION. The framework provided by this study gives managers a better understanding of the key levers GPs use to drive value, offering practical guidance on how to contribute to these efforts.

Managers of PORTFOLIO COMPANIES should recognize that VALUE CREATION requires their active engagement. Understanding the significant impact of LSE CAPEX on MULTIPLE EXPANSION, managers should actively identify and propose such investments. This approach aligns with their long-term interests, as the benefits of these investments often extend beyond the GP's HOLDING PERIOD. Managers should prioritize areas where LSE CAPEX can most effectively strengthen the company's growth prospects, improve operational efficiency, or enhance market positioning. By presenting well-justified investment opportunities, managers can help GPs appreciate the potential for MULTIPLE EXPANSION from these initiatives, even if immediate EBITDA GROWTH is not realized.

Similarly, managers should recognize the strategic importance of refocusing the business. The study shows that STREFOC, particularly when combined with LS R&D, can significantly increase MULTIPLE EXPANSION. Managers can proactively identify non-core assets for divestiture to streamline the PORTFOLIO COMPANY's operations, enhancing its appeal to potential buyers. At the same time, investing in LS R&D positions the PORTFOLIO COMPANY for innovation and long-term growth. By implementing these ACTIONS, managers can play a critical role in driving VALUE CREATION via MULTIPLE EXPANSION.

ADD-ON acquisitions offer managers a significant opportunity to drive VALUE CREATION through MULTIPLE EXPANSION. By leveraging their industry expertise, managers can identify potential ADD-ONS that would complement the PORTFOLIO COMPANY's operations, enhance its market share, or introduce new capabilities. Presenting a compelling case for these acquisitions enables managers to facilitate MULTIPLE EXPANSION and achieve higher EXIT returns for the GP while positioning the PORTFOLIO COMPANY for long-term success. As with LSE CAPEX, pursuing ADD-ONS aligns the GP's focus on short-term returns with the company's long-term growth objectives.

In conclusion, this study highlights the importance of PORTFOLIO COMPANY managers taking an active role in understanding the ACTIONS employed by GPs for VALUE CREATION. The findings emphasize the need for a holistic approach to VALUE CREATION in private equity TRANSACTIONS, with clear implications for both GPs and PORTFOLIO COMPANY managers. Ultimately, this study calls for continuous dialogue and collaboration between GPs and PORTFOLIO COMPANY managers, focusing on ACTIONS that drive VALUE CREATION in an increasingly complex and competitive private equity landscape. By applying the lessons from this study, both GPs and managers can contribute to sustainable VALUE CREATION, resulting in stronger PORTFOLIO COMPANIES and higher returns.

6.5 LIMITATIONS

While this study offers valuable insights into ACTIONS for MULTIPLE EXPANSION in private equity TRANSACTIONS, several limitations may affect its interpretability and generalizability. These limitations are essential for contextualizing the findings and identifying areas where future research can build on and improve the study's scope and applicability.

A key limitation of this study is the relatively small sample size used for the regression analysis, comprising 68 PARTICIPATIONS. This small sample size may reduce statistical power, potentially affecting the robustness of the findings and increasing the likelihood of Type II errors. This could hinder the generalizability of the conclusions to the broader population of private equity TRANSACTIONS. A larger dataset would likely provide more reliable estimates and better reflect the diversity of private equity deals across different sectors and regions. Nevertheless, the unique depth and quality of the data used in this study mitigate some concerns about reliability, lending credibility to the results despite the sample size constraint.

Another limitation of this study is the reliance on dummy variables for several independent variables. While commonly used in regression models to represent categorical data, dummy variables may oversimplify complex relationships. By

reducing variables to binary categories, the study might have overlooked subtle nuances and interactions that could have provided a more detailed understanding of the factors driving MULTIPLE EXPANSION and VALUE CREATION. While this approach simplifies the model and facilitates analysis, future studies could employ more sophisticated ways of capturing categorical data or interaction effects to provide a more comprehensive analysis.

The sample selection, which includes five funds from four different GPs, may limit the generalizability of the study's findings. While all GPs in the sample follow a generalist approach, investment strategies, industry focuses, and risk tolerances can vary significantly among GPs. As a result, the findings from this specific sample may not be representative of all private equity funds. Given the diverse approaches to VALUE CREATION employed by various GPs, the findings of this study may not fully capture the complexity of private equity as a whole. However, the framework provided here clearly links ACTIONS to specific P&L, balance sheet, and cash-flow positions, offering a clear classification into EBITDA GROWTH, DELEVERAGE, and MULTIPLE EXPANSION—all components of VALUE CREATION. Still, expanding the sample to include more funds from a wider range of GPs would enhance the representativeness of the findings and provide a broader understanding of the factors influencing MULTIPLE EXPANSION and VALUE CREATION.

Regarding LSE CAPEX and LS R&D, a more comprehensive dataset could have provided greater clarity on the specifics of these investments. While the analysis differentiated between maintenance and expansion CAPEX, certain investments may contribute more significantly to MULTIPLE EXPANSION than others. Access to more precise data would have enabled sharper insights, particularly for managers and GPs.

For ADD-ONS, a more specific dataset would have allowed for deeper analysis of the types of ADD-ONS that are most effective at driving MULTIPLE EXPANSION, such as those focused on scaling, expanding technologies, or increasing international presence. Greater clarity on these distinctions would have provided more actionable insights for decision-makers.

6.6 DIRECTIONS FOR FUTURE RESEARCH

The findings of this study suggest several key directions for further research. Future studies on VALUE CREATION in private equity should build on the provided framework and focus on its mechanics, using PORTFOLIO COMPANIES' profit and loss statements, balance sheets, cash flow statements, and MULTIPLE-BASED VALUATION. This approach is essential for understanding that EBITDA GROWTH, DELEVERAGE, and MULTIPLE EXPANSION are the only elements that can drive changes in value.

Understanding these mechanics opens new perspectives on how specific ACTIONS drive change and target components of VALUE CREATION. This deeper understanding allows for a more precise analysis of how each strategic decision impacts EBITDA GROWTH, DELEVERAGE, or MULTIPLE EXPANSION, offering clearer insights into VALUE CREATION within private equity and the ACTIONS pursued by GPs.

This study's demonstration that specific ACTIONS cause MULTIPLE EXPANSION suggests a clear path for further research: identifying additional ACTIONS with a measurable positive effect. Such analysis would be particularly valuable for ACTIONS that incur costs (reducing DELEVERAGE) but do not immediately boost EBITDA GROWTH. These ACTIONS challenge the GP's short-term interests, suggesting that other strategic motives may be at work. Testing the impact of patenting activity, improvements in specific ESG criteria, or sustainability measures on MULTIPLE EXPANSION could provide highly valuable insights. Evidence linking non-traditional or "soft" assets to VALUE CREATION would illuminate their role in driving economic value through MULTIPLE EXPANSION, particularly in a context where innovation, ESG standards, and sustainability are increasingly prioritized. Exploring these areas could reveal whether such initiatives contribute to VALUE CREATION despite not generating immediate EBITDA GROWTH.

As for the variables, with regard to LSE CAPEX, the variable was derived by focusing on expansion CAPEX, that is, CAPEX in excess of depreciation, and late-stage CAPEX, namely CAPEX in the year of EXIT. Further research could apply a more specific approach to gain additional insight and potentially differentiate between investments. The same holds true for LS R&D. STREFOC offers the potential to distinguish more

clearly between initiatives. Likewise, future research could explore which ADD-ONS contribute the most to MULTIPLE EXPANSION.

Moreover, future research could investigate in greater detail the potential interaction effects between variables to explore how different ACTIONS combine to create MULTIPLE EXPANSION.

The limitations of this study highlight the need for further research to deepen the understanding of MULTIPLE EXPANSION and VALUE CREATION in private equity TRANSACTIONS. As private equity continues to evolve, identifying and understanding the ACTIONS that drive MULTIPLE EXPANSION will remain critical for both practitioners and academics. This study contributes to that understanding by presenting new evidence that MULTIPLE EXPANSION can be achieved through specific ACTIONS initiated by GPs and PORTFOLIO COMPANY managers, setting the stage for future research.

6.7 CONCLUSION (SPANISH)

La siguiente sección proporciona un resumen exhaustivo del estudio y de sus principales hallazgos, destacando las implicancias tanto para los investigadores académicos como para los profesionales de la industria. Examina cómo los resultados contribuyen al conocimiento y las prácticas existentes, ofreciendo perspectivas valiosas para su aplicación y estudio futuros. Además, esta sección aborda las limitaciones del estudio mediante una evaluación crítica de los desafíos enfrentados y las restricciones que podrían afectar la generalización de los hallazgos.

La discusión luego se centra en posibles vías para investigaciones futuras, sugiriendo áreas donde investigaciones adicionales podrían mejorar aún más la comprensión y contribuir al desarrollo continuo del campo. Estas sugerencias tienen como objetivo inspirar estudios futuros que amplíen esta investigación, explorando nuevas dimensiones y refinando los enfoques hacia la MULTIPLE EXPANSION y la VALUE CREATION en el ámbito del private equity.

6.8.1 RESUMEN DEL ESTUDIO

El estudio comenzó con una revisión exhaustiva de la literatura académica sobre private equity, enfocándose particularmente en las ACTIONS lideradas por los GPs en las PORTFOLIO COMPANIES dirigidas a la VALUE CREATION y la MULTIPLE EXPANSION, siendo esta última un vacío significativo en la literatura académica. Esta revisión no se limitó a resumir estudios previos, sino que exploró en detalle cómo sus hallazgos han evolucionado a lo largo del tiempo, a medida que los GPs ampliaron su portafolio de ACTIONS aplicadas en las PORTFOLIO COMPANIES dentro de una industria en proceso de maduración.

El estudio identificó direcciones clave de investigación y hallazgos que han moldeado la comprensión de la VALUE CREATION en private equity. Cabe destacar que las investigaciones iniciales (Scholes et al., 1990) identifican el uso de deuda externa y su amortización (DELEVERAGE) como una de las principales fuentes de VALUE CREATION. Conocida como ingeniería financiera, esta ACTION implica financiar adquisiciones con grandes cantidades de deuda, lo que no solo ofrece beneficios fiscales durante el proceso de pago, sino que también minimiza el capital propio necesario para la TRANSACTION. Sin embargo, esta ACTION presenta desventajas. Una porción significativa de los flujos de efectivo libres de la PORTFOLIO COMPANIES debe destinarse al pago de la deuda durante el HOLDING PERIOD, lo que limita los fondos disponibles para otras iniciativas de crecimiento y potencialmente sobrecarga a la compañía.

En este contexto, la descapitalización de activos (asset stripping) fue una ACTION controvertida en los comienzos del private equity. Los GPs vendían activos comercializables de las PORTFOLIO COMPANIES para generar efectivo. Si bien este enfoque ofrecía una rápida VALUE CREATION a través del DELEVERAGE, era insostenible y arriesgado. Los mayores gastos de leasing o alquiler derivados de las TRANSACTIONS de sale and leaseback debilitaban la resiliencia de las empresas ante recesiones económicas. Estudios académicos, como los de Jensen (1970) y Strömberg (2009), documentaron esta práctica y su asociación con quiebras.

Tras el énfasis inicial en el DELEVERAGE como un motor clave de la VALUE CREATION, la literatura académica cambió su enfoque hacia el crecimiento y las mejoras operativas en el private equity. Lichtenberg y Siegel (1989) fueron de los primeros en destacar los aumentos de productividad en empresas propiedad de private equity. Posteriormente, Kaplan (1989) señaló mejoras en la rentabilidad en comparación con los indicadores de la industria, mientras que Smith (1990) confirmó igualmente el crecimiento de la productividad como un factor que contribuye a la VALUE CREATION. A finales de la década de 2000, Pindur (2007) y Brigl et al. (2008) subrayaron la creciente importancia de las mejoras operativas, demostrando que los retornos del private equity dependían cada vez más del crecimiento de los ingresos y los márgenes, en lugar de una reestructuración financiera pura.

Hacia finales de la década de 2010, Lahmann et al. (2017) y Burth y Reißig-Thust (2019) identificaron las mejoras operativas como una práctica estándar en los buyouts, destacando el papel de estas ACTIONS en el impulso del desempeño de las empresas. Previamente, Vester (2011) había encontrado que la mitad de la VALUE CREATION en las transacciones de private equity en América del Norte provenía de mejoras operativas y estratégicas, estableciendo el EBITDA GROWTH como el componente dominante de la VALUE CREATION en ese momento.

Estos hallazgos se contextualizaron dentro de una industria cada vez más profesionalizada, caracterizada por el creciente AuM y el aumento en el número de GPs, como se discutió en la Sección 2.2. Este contexto es crucial para explicar cómo la intensificación de la presión competitiva impulsa a los GPs a adoptar ACTIONS más sofisticadas para garantizar retornos exitosos. El estudio también subraya la necesidad de comprender por qué, en una industria en rápida evolución, los GPs desarrollan constantemente nuevas ACTIONS: las ACTIONS anteriores, particularmente aquellas que implican altos niveles de deuda y asset stripping, que alguna vez fueron efectivas y respaldadas por literatura académica más antigua, pueden ahora ser insuficientes e inadecuadas para lograr los retornos financieros deseados.

La introducción también incluyó una clasificación crítica de las ACTIONS validadas por estudios académicos, tal como se describe en la Sección 2.6. Estas ACTIONS se

organizaron sistemáticamente en un marco, ilustrado en la Figura 8, para demostrar sus impactos individuales y distintivos en los estados financieros, específicamente en el P&L, el balance sheet y el cash flow statement. Esta clasificación alinea las ACTIONS con la MULTIPLE-BASED VALUATION, una metodología de valoración ampliamente reconocida en la industria de private equity. Utilizando este marco, el estudio diferencia claramente las ACTIONS por su influencia en la VALUE CREATION, categorizándolas en aquellas dirigidas a influir en el EBITDA GROWTH, el DELEVERAGE y la MULTIPLE EXPANSION, siendo esta última el enfoque principal.

Este enfoque estructurado clarifica los efectos de los mecanismos previamente reconocidos de VALUE CREATION y, al mismo tiempo, destaca las ACTIONS específicas tomadas en la búsqueda de la MULTIPLE EXPANSION, que han sido en gran medida pasadas por alto en investigaciones anteriores. En consecuencia, el estudio se ha centrado en cuatro hipótesis relacionadas con específicas ACTIONS supuestamente iniciadas por los GPs para lograr la MULTIPLE EXPANSION en las PORTFOLIO COMPANIES.

La Hipótesis 1 propone un efecto positivo significativo del LSE CAPEX en la MULTIPLE EXPANSION. El LSE CAPEX implica salidas de efectivo sustanciales, lo que impacta negativamente en el DELEVERAGE. En cuanto al P&L y el posible EBITDA GROWTH, las inversiones típicamente requieren un periodo de recuperación de más de 3 años, según Yard (2000), por lo que este se extiende más allá de la EXIT. Esto sugiere que los GPs buscan la MULTIPLE EXPANSION con el LSE CAPEX, basándose en la premisa de que los GPs consistentemente intentan incrementar el EQUITY VALUE con cada ACTION que emprenden.

El mismo razonamiento se aplica al LS R&D, como se explica en la Sección 3.2, con la distinción de que el LS R&D implica inversiones en activos intangibles en lugar de tangibles. Sus características permanecen idénticas: el LS R&D reduce el DELEVERAGE y, debido a la naturaleza a largo plazo de estas inversiones, no se esperan efectos positivos en el EBITDA GROWTH dentro del HOLDING PERIOD restante. En consecuencia, los GPs deben estar apuntando a la MULTIPLE EXPANSION mediante estas ACTIONS. Por lo tanto, la Hipótesis 2 propone que el LS R&D tiene un efecto positivo significativo en la MULTIPLE EXPANSION.

Estudios anteriores, incluidos Barber y Goold (2007), destacan cómo los GPs crean valor adquiriendo y reenfocando unidades de negocio no centrales. La Hipótesis 3 se basa en esto al proponer que el StRefoc tiene un efecto positivo significativo en la Multiple Expansion. Sugiere que los GPs crean valor mediante el realineamiento estratégico, atrayendo EBITDA Multiples más altos en la venta. Además, apoyándose en Biesinger (2020), se propone que las desinversiones permiten a los GPs reenfocar las Portfolio Companies, mejorando su atractivo estratégico y logrando la Multiple Expansion al vender negocios más simplificados y estratégicamente alineados.

Los Add-ons son ampliamente utilizados en el private equity para construir valor integrando empresas más pequeñas en una Portfolio Company plataforma más grande. Aunque la investigación confirma que las Transactions lideradas por GPs que incluyen Add-ons superan a las que no los incluyen, principalmente debido al EBITDA Growth por encima del promedio y a los beneficios de la Multiple Expansion, los mecanismos exactos detrás de su Value Creation siguen siendo poco claros, como señala Hammer et al. (2022).

La Hipótesis 4 propone que los Add-ons tienen un efecto positivo significativo en la Multiple Expansion. Dado que las empresas más pequeñas suelen valorarse con EBITDA Multiples más bajos, experimentan un aumento en su valoración al nivel del EBITDA Multiples de la plataforma al integrarse en el grupo más grande. Esto se atribuye a una posición de mercado más sólida, economías de escala mejoradas y mayor estabilidad financiera derivada de formar parte de una entidad más grande. Por lo tanto, el estudio propone que el principal motivo de los Add-ons es la Multiple Expansion.

6.8.2 Resumen de los resultados

La parte analítica de este estudio involucró pruebas estadísticas (Sección 4.3), incluidas la prueba t para dos muestras, la prueba de suma de rangos de Wilcoxon y la prueba de la mediana, que sirvieron como base para análisis adicionales. Luego, el

estudio aplicó un análisis de regresión básica (Sección 5.2), que se repitió con variables de control (Sección 5.3). Finalmente, se realizó una regresión escalonada hacia atrás (Sección 5.4) para mejorar la precisión predictiva del modelo, resultando en un conjunto refinado de variables que mejor explican la variación en la MULTIPLE EXPANSION. Las regresiones concluyen con pruebas de efectos de interacción en sección 5.5. Para resumir los hallazgos:

H_1: LSE CAPEX tiene un efecto positivo significativo en la MULTIPLE EXPANSION ($\beta_1 > 0$)

La hipótesis 1 fue consistentemente confirmada en todas las pruebas estadísticas de la Sección 4.3 y mostró un efecto positivo significativo en todas las regresiones (Secciones 5.2–5.4). En la regresión escalonada (Sección 5.4), la presencia de LSE CAPEX correspondió a un aumento del 46.7% en el logaritmo de la MULTIPLE EXPANSION.

Como se discutió en la Sección 3.1, ninguna investigación académica previa ha vinculado directamente el LSE CAPEX con la MULTIPLE EXPANSION. Estudios anteriores, como Dean (1953) y Chambers et al. (1999), examinaron políticas de CAPEX, enfocándose en las proporciones óptimas de gasto y niveles de inversión para lograr objetivos empresariales específicos, desde mantener operaciones hasta impulsar el crecimiento. Sin embargo, en el contexto del private equity, el discurso se ha centrado en las restricciones estructurales impuestas a las PORTFOLIO COMPANIES tras la ENTRY de los GPs. Los altos niveles de deuda y las políticas de gasto restrictivas a menudo limitan el CAPEX , con Lichtenberg y Siegel (1989) destacando los riesgos potenciales de la subinversión en LBOs debido a la deuda excesiva.

Si los GPs suelen ser conservadores con el CAPEX , particularmente hacia el final del HOLDING PERIOD, ¿por qué permitirían un LSE CAPEX significativo, que no incrementa inmediatamente el EBITDA GROWTH y reduce el DELEVERAGE? La respuesta radica en la búsqueda de la MULTIPLE EXPANSION. Al permitir el LSE CAPEX justo antes de la EXIT, los GPs buscan alcanzar un EBITDA MULTIPLE más alto en la venta, aumentando la VALUE CREATION a través de la MULTIPLE EXPANSION en lugar de asegurar el DELEVERAGE.

Esta hipótesis, ahora confirmada, es innovadora. Desafía la visión tradicional de que los GPs priorizan ganancias a corto plazo y destaca un cambio estratégico hacia la inversión en LSE CAPEX cerca de la EXIT para aumentar los EBITDA MULTIPLES, incluso cuando las PORTFOLIO COMPANIES solo cosechan los beneficios después del HOLDING PERIOD. Este hallazgo redefine las percepciones sobre ACTIONS de los GPs y aborda un vacío crítico en la comprensión del papel del LSE CAPEX en impulsar la MULTIPLE EXPANSION.

H_2: LS R&D tiene un efecto positivo significativo en la MULTIPLE EXPANSION ($\beta_2 > 0$)

La hipótesis 2 fue rechazada en la Sección 4.3., ya que todas las pruebas estadísticas no mostraron significancia. Tampoco resultó significativa en las regresiones (Secciones 5.2–5.4). Sin embargo, en la Sección 5.5, el efecto de interacción entre LS R&D y STREFOC demostró un impacto positivo significativo en la MULTIPLE EXPANSION. La presencia de las ACTIONS combinadas estuvo acompañada por un incremento del 35.2% en MULTIPLE EXPANSION.

Capizzi et al. (2011) encuentran que las empresas lideradas por GPs tienden a poseer más activos intangibles, lo que indica una mayor actividad de R&D en comparación con las empresas no lideradas por GPs. Cirillo et al. (2019) revelan además que, si bien la propiedad familiar generalmente reduce la inversión en R&D, la participación de los GPs compensa esto, aumentando el gasto en R&D. A diferencia del CAPEX, el R&D tiene una conexión más clara con la VALUE CREATION, como lo destacan estudios como Battisti et al. (2019), que subrayan la importancia de la innovación para construir ventajas competitivas sostenibles. Sin embargo, el impacto específico de las inversiones en R&D sobre el valor en la EXIT sigue siendo poco comprendido, dejando un vacío en la literatura actual.

A pesar de la percepción más favorable de la participación de los GPs en el R&D en comparación con el CAPEX, persiste el desafío temporal. Como señalan Lerner et al. (2008), los gastos en R&D son inversiones a largo plazo, con costos registrados de manera inmediata mientras que los beneficios típicamente no se materializan hasta años después, a menudo más allá del HOLDING PERIOD.

Este estudio anticipaba resultados similares para el LS R&D como para el LSE CAPEX, pero los hallazgos no respaldaron esta hipótesis, posiblemente debido a un tamaño de muestra insuficiente. Sin embargo, el efecto de interacción significativo con STREFOC sugiere que el LS R&D es más efectivo cuando se combina con un reenfoque estratégico. Esto abre nuevas oportunidades para investigaciones futuras sobre cómo estas ACTIONS interactúan para impulsar la MULTIPLE EXPANSION.

H_3: STREFOC tiene un efecto positivo significativo en la MULTIPLE EXPANSION ($\beta_3 > 0$)

Las pruebas estadísticas no proporcionaron evidencia consistente de diferencias estadísticamente significativas que respalden la Hipótesis 3. Además, el STREFOC se mantuvo insignificante en las regresiones de las Secciones 5.2–5.4. Sin embargo, como se indicó anteriormente, el efecto de interacción entre LS R&D y STREFOC, probado en la Sección 5.5, mostró un efecto positivo significativo en la MULTIPLE EXPANSION.

Este resultado también podría deberse al tamaño limitado de la muestra. Un conjunto de datos más amplio, particularmente uno que aísle los spin-offs y desinversiones para un análisis separado, podría proporcionar evidencia más sólida sobre el efecto del STREFOC. Dada la aplicación frecuente de esta estrategia, investigaciones adicionales podrían ofrecer perspectivas valiosas sobre las ACTIONS de los GPs y proporcionar una comprensión más clara de si el STREFOC contribuye a la MULTIPLE EXPANSION como una ACTION independiente. Estos hallazgos mejorarían la comprensión de la VALUE CREATION en las TRANSACTIONS de private equity. Considerando el efecto de interacción significativo con el LS R&D, investigaciones adicionales en esta área parecen particularmente prometedoras. H_4: ADD-ONS tienen un efecto positivo significativo en la MULTIPLE EXPANSION ($\beta_4 > 0$)

La Hipótesis 4 fue respaldada por todas las pruebas estadísticas presentadas en la Sección 4. También se mantuvo significativamente positiva en los análisis de regresión de las Secciones 5.2–5.4. En el análisis de regresión escalonada (Sección 5.4), la presencia de ADD-ONS se asoció con un aumento del 66.2% unidades en el logaritmo de la MULTIPLE EXPANSION.

Las pruebas estadísticas y los análisis de regresión en este estudio confirman que los ADD-ONS tienen un impacto positivo significativo en la MULTIPLE EXPANSION, marcando un hallazgo nuevo e importante en la investigación sobre private equity. Este resultado respalda suposiciones previas sobre el papel del crecimiento inorgánico en la VALUE CREATION, ahora respaldadas por datos concretos y análisis que apoyan estas perspectivas. El private equity ha estado tradicionalmente asociado con estrategias de crecimiento que implican adquisiciones, donde los ADD-ONS se integran en una PORTFOLIO COMPANY.

Como describen Gilligan y Galpin (2022), este enfoque se centra en adquirir una compañía plataforma con capacidades internas sólidas y luego añadir empresas más pequeñas para crear una entidad consolidada más valiosa. Mientras que estudios previos como Nikoskelainen y Wright (2007), Valkama et al. (2013) y Lahmann et al. (2017) han demostrado que los ADD-ONS contribuyen a la VALUE CREATION, no estaba completamente entendido que este valor se impulsa principalmente a través de la MULTIPLE EXPANSION. Los ADD-ONS no solo contribuyen al crecimiento general, sino que están directamente relacionados con la mejora de la MULTIPLE EXPANSION, con un efecto que se fortalece a medida que se integran más ADD-ONS. Este nuevo hallazgo ofrece una comprensión más clara de cómo los ADD-ONS impulsan la VALUE CREATION en private equity, consolidando su papel como una ACTION distintiva y poderosa.

En resumen, a través de diversas pruebas estadísticas y, finalmente, mediante una regresión escalonada hacia atrás con un umbral de $p < 0.2$, el estudio demostró que el LSE CAPEX tiene un efecto positivo significativo en la MULTIPLE EXPANSION, confirmando la validez de la Hipótesis 1. Además, para los ADD-ONS, el estudio reveló un efecto positivo significativo en la MULTIPLE EXPANSION.

En cuanto a LS R&D y STREFOC, inicialmente el estudio no pudo encontrar efectos positivos significativos que respaldaran las Hipótesis 2 y 3. Sin embargo, cuando se combinaron, el efecto de interacción entre LS R&D y STREFOC fue significativo indicando un efecto positivo en la MULTIPLE EXPANSION y, por lo tanto, respaldando las Hipótesis 2 y 3.

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