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Private Equity Performance Measurement Unwrapped: A Primer

*Por Aureliano Gentilini
y Juan Manuel Vicente Casadevall*

Free-riding y dilema del prisionero en las tomas de control mediante OPAs

Por Alvaro Ispizua Mendieta

Private Debt as a Strategic Asset: Performance, Structural Integration, and Portfolio Efficiency in Private Capital Markets

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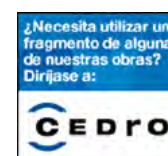
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Private Equity Performance Measurement Unwrapped: A Primer

(Medición de la rentabilidad en el private equity al descubierto, una guía)

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Sumario

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Abstract

It is well known that performance measurement in Private Markets is a challenging task mainly because of the irregular timing and size of cash flows of private equity funds. When trying to compare different PE funds, benchmark them against public markets, or other asset classes with a view to multi-asset portfolio allocation, popular metrics, like IRR, show key shortcomings, leading to biased results. IRR, in particular, reflects GPs' perspective and we continue to be surprised whenever we see LPs buying into it. What this perspective does not incorporate is how much capital, when and for how long the capital itself is invested. Additional metrics like MOIC, TPVIs or PME's have been developed and have gained popularity but they also carry several issues. Although the main scope of this article is to focus on private equity performance measurement, similar conclusions can be drawn when analysing other illiquid investments with irregular cash flows patterns, i.e. capital calls and distributions.

In this full article, we will dive into some of the most widely used performance measures and their limitations, suggesting some alternatives that can overcome the existing flaws of the metrics currently in use. The adoption of more advanced and accurate measures of performance can have many benefits and uses for both LPs and GPs. We share the conclusion of a recent research paper from INSEAD¹ “*As the market is maturing, there is hope that more sophisticated measures may become standard. It is up to LPs, as multi-asset class investors, to promote and request them.*”

¹ INSEAD (2019).

Keywords: Private Equity, Private Markets, Secondaries, Evergreen, Liquidity Solutions, Alternatives.

Resumen

Es bien sabido que la medición del rendimiento en los mercados privados es una tarea ardua, debido principalmente a la irregularidad del calendario y el volumen de los flujos de caja de los fondos de private equity. Cuando se trata de comparar distintos fondos de capital privado, comparaciones con los mercados públicos o con otras clases de activos con el objetivo de asignaciones en carteras multiactivo, métricas populares, como la TIR, muestran deficiencias clave que conducen a resultados sesgados. La TIR, en particular, refleja la perspectiva de los GPs y nos sigue sorprendiendo cada vez que vemos que los LPs la aceptan como medida de referencia. Lo que esta perspectiva no incorpora es cuánto capital, cuándo y durante cuánto tiempo se invierte el propio capital. Se han desarrollado otras métricas adicionales como MOIC, TPVI o PME, que han ganado popularidad, pero también conllevan varios problemas. Aunque este artículo se centra principalmente en la medición del rendimiento de los fondos de capital privado, pueden extraerse conclusiones similares al analizar otras inversiones ilíquidas con patrones irregulares de flujos de caja, es decir, con llamadas y distribuciones de capital en el tiempo.

En este artículo nos sumergiremos en algunas de las medidas de rendimiento más utilizadas y sus limitaciones, sugiriendo algunas alternativas que pueden superar los defectos existentes en las métricas actualmente en uso.

La adopción de medidas de rendimiento más avanzadas y precisas puede tener muchos beneficios y usos tanto para los LPs como para los GPs. Compartimos la conclusión de un reciente trabajo de investigación del INSEAD : “A medida que el mercado madura, existe la esperanza de que medidas más sofisticadas se conviertan en estándar. Corresponde a los LP, como inversores en múltiples clases de activos, promoverlas y solicitarlas.”

Palabras clave: Capital Privado, Mercados Privados, Secundarios, Inversiones Alternativas, Ilquidez.

1. Private equity as an asset class and its intrinsic features

Private equity, as the term evokes, involves investments of equity capital in private businesses. Private equity is, indeed, a stake in a private company. Generally speaking, private equity refers to a leveraged acquisition/buyout of a large interest in a mature, cash-flow-stable company. Earlier stage investments are usually labelled as venture capital².

Investors usually access private equity investments through closed-end funds set up by General Partners (GPs) through Limited Partnership Agreements.

Limited partnerships have a fixed life-span (usual 10 years) and are self-liquidating. In the first 5-year (investment period) GPs have the right to call tranches of the capital committed by the investors, Limited Partners (LPs), to purchase private equity stakes. In the second 5 years (liquidation period) the stakes are sold and capital and net gains are

2 Private Equity encompasses the following fund stage focus:
Buyout fund: Funds acquiring companies by purchasing majority or controlling stakes, financing the transaction through a mix of equity and debt.
Generalist fund: Funds investing in all stages of private equity.
Growth fund: Funds that make private equity investments (often minority investments) in relatively mature companies that are looking for primary capital to expand and improve operations or enter new markets to accelerate the growth of the business.
Mezzanine fund: Funds using a hybrid of debt and equity financing, comprising equity-based options (such as warrants) and lower-priority (subordinated) debt.
Venture Capital: Early-stage fund: Venture capital funds focus on investing in companies in the early stages of their business lives.
Later-stage fund: Venture capital funds providing capital for an operating company which may or may not be profitable. Typically, in C or D rounds.
Venture fund (all stages): Venture capital funds focused on both early and later stage investments.

returned to LPs. Upon LPs' approval, the fund life can be extended to facilitate liquidation.

Private equity lifecycle spans a period of 7-10 years and differs from public equity investing and other investable asset classes, encompassing four distinct stages: establishing the fund and fundraising, identifying and investing in target companies, boosting operational and management efficiency and creating value in portfolio companies, exit portfolio companies, realising investment and, if successful, distributing gains and returning cash to investors. Funds that are halfway through their lifecycle are in the sweet spot, with the final stage when investments are realised usually labelled as the harvest period.

Private equity investors' performance experience through the lifecycle of a fund is usually mapped out and graphically represented in a chart plotting growth with respect to time as a "J"-Curve, which illustrates the initial dip in returns that private equity investment experience before realising significant returns. In the first few years, investors face capital calls, while also paying management fees and upfront costs. As the fund deploys the capital, returns do not materialise being insufficient to overcome fees, thus resulting in negative return. As time passes and the fund enters the next stages of its lifecycle returns generally improve, delivering positive readings.

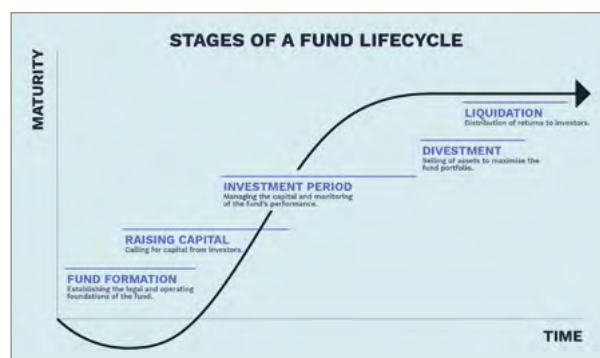
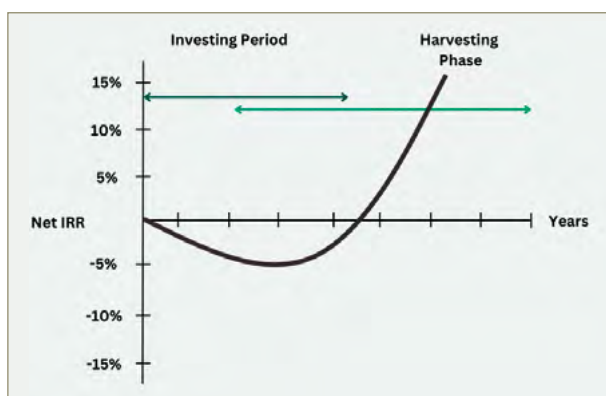
However, in our view, private equity investors' performance experience is better mapped out as a sigmoid curve, which better represent the influence of time on cash flows patterns. In fact, as the market becomes saturated and divestment materialise, eventually leading to liquidation and distribution of returns to investors, the performance growth slows, flattening out and leading to the levelling off of the curve.

(Graphic: Exhibit 1.)

Private equity characteristics significantly differs from traditional asset classes like stocks and bonds. The fact that in unlisted private markets there are no standardised market practices for reporting and regulatory compliant metrics for calculating funds' performance makes it difficult to evaluate private equity investments. Navigating the intricacies of the asset class, which is relatively less transparent than its public counterparts, may be difficult.

Furthermore, the GIPS Standards clarify that performance reporting is of little value unless the underlying valuations are based on sound valuation principles. In particular, GIPS Standards (<https://www.gipsstandards.org/>) dictate that "*private equity investments must be valued in accordance with the definition of fair value³ and the GIPS Valuation Principles in Chapter II.*"

Exhibit 1. J-Curve vs. S-curve in PE investing



Source: Hamilton Lane and Oister Global

3 The GIPS Standards define the fair value as "the amount at which an investment could be exchanged in a current arm's length transaction between willing parties in which the parties each act knowledgeably and prudently. The valuation must be determined using the objective, observable, unadjusted quoted market price for an identical investment in an active market on the measurement date, if available. In the absence of an objective, observable, unadjusted quoted market price for an identical investment in an active market on the measurement date, the valuation must represent the firm's best estimate of the market value. Fair value must include accrued income."

The performance measurement of private equity investments faces a number of challenges, not only because of the typical lifecycle of private equity funds, but also for the cash flows dynamics and the dry powder⁴ consideration.

In fact, not only do multiples, as well as alternative money-weighted performance measures, not factor in the time taken to generate returns, but they also fail to account for the private equity fund's lifecycle. Thus, comparing these metrics across funds may not be meaningful unless they have the same vintage years and similar cash flows patterns.

Conversely, time-weighted rates of return do not reflect cash flows in and out of a portfolio, thus specifically sterilising the impact of cash flows on the calculated rate of return.

2. Private Equity performance valuation: A review of existing metrics and their weaknesses

IRR (Internal Rate of Return) is the most commonly adopted money-weighted metrics to compute returns on private equity investments. IRR is a discount rate that makes the net present value (NPV) of all cash flows equal to zero. IRR is widely published by GPs in marketing documentation as a standard to calculate performance at fund level and lure LPs investments. However, IRR cannot be accurately averaged and aggregated at portfolio level, as well as compared across asset classes and within peer groups.

The problem with IRR arises from LPs' perspective, which should incorporate the notion of time in their investment decisions, factoring in how much capital, when and for how long the amount of committed capital is invested. However, IRR is atemporal and only relevant for a point in time and cannot be accurately averaged, delivering an inaccurate proxy of portfolio's performance. Furthermore, compounding (as computed with

geometric means) implies asset realization and reinvestment assumption.

In this respect, one of the major flaws of IRR is just its reinvestment assumption, i.e., the fact that capital distributed to LPs early on will be reinvested over the life of the PE fund at the same IRR as calculated at the early exit

Furthermore, IRR is influenced by debt financing techniques⁵ that postpone contributions and anticipate distributions, thereby artificially increasing the reading. Since IRR is driven by early distributions, fund managers can strategically manipulate IRR.

Exhibit 2 below illustrates the role played by early distributions on IRR, with the first distribution accounting the most in the calculation of the final IRR reading. All funds have early distributions. Fund A and B have the same multiple of money (MOIC), but the first distribution of Fund B is half that of Fund 1 (€35 instead of €70). Fund C distributed almost twice as much as Fund A on Dec. 31, 2022, but its IRR increases only relatively by 9.6 percentage points. Despite a relatively low difference in IRR between Fund A and C, Fund C shows a MOIC that is significantly higher than Fund A (1.87 vs. 1.39), suggesting that Fund C is a better investment choice.

(Tablet: Exhibit 2)

In Exhibit 3 it is evident how three different funds of the same 2018 vintage, with an identical committed capital of 100 euros and different percentage of drawn capital and cash flow amounts, occurring at different dates (contributions with negative readings and distributions with positive readings), lead to identical IRR, DPI, and TVPI results.

TVPI means "total value to paid-in" capital and calculates the total value—both realized returns (distributions) and unrealized returns (residual values)—that a private equity fund has generated for investors relative to the amount of capital

4 Dry powder refers to the amount of capital that has been committed by investors but has yet to be "called" by investment managers in order to be allocated to specific investments.

5 Amongst others, fund subscription lines of credit to defer capital calls and equity bridge financing to increase dividend payments.

Exhibit, 2 – Influence of early distributions on IRR

	Capital Commitment	Residual Value							Drawn Capital	IRR	DPI	TVPI	MOIC
		31/01/2018	31/12/2018	31/12/2019	31/12/2020	31/12/2021	31/12/2022	31/12/2023					
Fund A	100	-65	70	3	3	3	50	10	65.00%	39.3%	2.0	2.1	1.39
Fund B	100	-65	35	3	3	3	80	15	65.00%	21.6%	1.9	2.1	1.39
Fund C	100	-65	70	3	3	3	95	13	65.00%	48.9%	2.7	2.9	1.87

Source: authors' calculations

Exhibit 3 – Buyout funds, vintage 2018 – Cash flows vs. performance metrics and multiples

	Capital Commitment	Residual Value							Drawn Capital	IRR	DPI	TVPI	MOIC
		31/01/2018	31/12/2018	31/12/2019	31/12/2020	31/12/2021	31/12/2022	31/12/2023					
Fund A	100	-20	-41	20	97	5	-	13	61.00%	37.4%	2.0	2.2	1.35
Fund B	100	-	-30	-60	30	150	-	18	90.00%	37.4%	2.0	2.2	1.98
Fund C	100	-	-	-25	-50	25	125	15	75.00%	37.4%	2.0	2.2	1.65

Source: authors' calculations

contributed. When comparing TVPIs of different funds it is critical to compare funds of similar vintage years in order to avoid the apples-to-oranges peer group trap. DPI (distributions to paid-in capital) focuses on cash returns and liquidity as it factors in realised returns only (distributions) in the calculation. A DPI above 1.00 means a fund generated positive returns. MOIC (multiple on invested capital) tries to answer at fund level what TVPI answers for an individual investor, i.e. how much value did the fund generate? Although it does not calculate a time-weighted rate of return, as it does not factor in the timing of capital calls or distributions, MOIC tells investors how the value of an investment has grown on an absolute basis.

MOIC has different implications whenever the time required to generate the underlying return is taken into account. A MOIC of 1.35 that is generated in six years implies a return that is different from the same MOIC generated in four years. In fact, MOIC of Fund A (1.35) in Exhibit 3 corresponds to an annualized return of 5.13% taking into account the calendar time of 6 years. Conversely, for the same calendar period, MOIC of Fund C (1.65) corresponds to an annualized return of 8.70%.

It is important to note that the readings at the numerator of both MOIC and TVPI—distributions to the fund and residual fair value—are all calculated

before fees, expenses, and carried interest, meaning that effective readings for investors are lower than what is generally published.

The relative importance of TVPI and DPI in private equity valuations depends upon investors' perspective and the fund lifecycle, as described earlier. In early stages of private equity investment TVPI ranks higher among investors' peer group screening factors as it reflects both the potential upside (from NAV) and any early distributions. As the investment matures, exits and distributions step up, making DPI a relatively more important metric.

(Tablet: Exhibit 3)

Money-weighted metrics such as IRR and multiples do not account for the time-value of money.

IRR, in particular, **is not an annualized compound growth rate**. In Exhibit 3 above, the 37.4% IRR does not return every year 37.4 euros on the 100 euros invested capital as an annualized compound growth rate. Also, the residual value factored in the calculation of TVPI and MOIC is a fair value estimate that may significantly differ from the value realized when the investments are liquidated by GPs and distributed to LPs. Because of that, TVPI and MOIC readings may be subject to change at liquidation.

Public Market Equivalent (PME) is a methodology to assess the performance of a private equity fund relative to a public market benchmark. It compares public and private market investments by theoretically investing in the index the cash flows from the private equity fund and then determining the IRR of the theoretical investment.

PME's adoption by market practitioners is based on the apparent ability of the metric to determine whether there is positive or negative alpha in private equity investment, thus assessing the ability of GPs to deliver risk premia. Further variations of the PME include the PME+, Modified PME, Kaplan Schoar PME (KS-PME), Direct Alpha, and PERACs Alpha.

However, PME calculations are performed on a single-asset basis and the results are hardly comparable across funds, and cannot be averaged out.

PME is not a compound growth rate that can be used in performance measurement and multi-asset portfolio allocation decisions. Rather it is a measure of relative performance that does not capture the full dynamics of private market investments either from GPs' perspective, who do not set their targets in terms of relative performance versus a listed benchmark, or from LPs' one, who have not found a consensus on the appropriate private market benchmarks to consider, given the current debate on PE risk-adjusted returns. Similar to IRR, PME does not allow additivity. Furthermore, LPs are reasonably not interested in any "closet indexing" features that the PME, measuring the wealth multiple effect of investing in private markets versus public market indexes, appears to test at fund level.

In summary, no single performance standard of those highlighted above captures the actual growth

in wealth generated by a private equity investment over time.

To date, the main issue preventing the accurate calculation of private equity returns (disentangled in their beta and alpha components) with the traditional money-weighted metrics was the lack of the properties of additivity and compounding of those measures.

The most recent introduction of Duration-adjusted Return on Capital (DARC) to measure private equity performance places the valuation of private investments in a time-weighted context.

By adding the critical element of duration to private equity return calculation, DARC provides an understanding of:

- a) when, on average, investors start to earn the return that IRR represents;
- b) on how much capital; and
- c) how long that return is earned.

The new paradigm of DARC computes private equity returns in the same time-weighted fashion of any other asset class, thus making unbiased pricing, proper benchmarking, multi-asset portfolio allocation, and risk transfer in private markets possible. As it calculates private equity returns in a traditional time-weighted framework, DARC overcomes the aggregation and averaging limitations of IRR, which are well-documented in literature.

The Exhibit 4 below provides an overview of the advantages and weaknesses of various Private Equity valuation metrics.

Exhibit 4 - Advantages and Weaknesses of Various Private Equity Valuation Metrics

Method	Authors	Advantages	Weaknesses
IRR	Irving Fisher in his book "The Rate of Interest" (1907) called it "rate of return over costs."	- Intuitive appeal, although practitioners often interpret (erroneously) IRR as the equivalent annual return on a given investment. - At deal level, IRR is a proxy for time-weighted returns.	- IRR can be skewed by large contributions or distributions. - Period return, not a total return measure. - Sensitive to early distributions. - Unrealistic reinvestment assumptions. - Lack of additivity needed to infer an unbiased fund-level return. - Aggregation of IRR data is not unambiguous. - Cannot be used to rank mutually exclusive investments with different timing or that are of unequal amounts. - Not useful for absolute return or performance benchmarking.
MIRR	First discovered in the 18 th century and rediscovered in the 1950s by Baldwin, R. H. in his 1959's article—How to assess investment proposals.	- Assumes that positive cash flows are reinvested at the reinvestment rate that corresponds to the firm's cost of capital. - Designed to generate one solution, eliminating the issue of multiple IRRs.	- Estimation of the financing rate to discount the capital calls. - Estimation of the cost of capital to compound all distributions to the valuation date. - Requires additional analysis to address the issue of investment options of different sizes.
Index Comparison Method (ICM), a.k.a. Public Market Equivalent (PME)	Long, Nickels	- Intuitive approach. - Defined as the IRR of public market investments.	- IRR spread is sensitive to terminal value and fund age. - IRR spread may be biased. - Not always defined, as large distributions may produce a negative PME NAV. - No exact solution.
Kaplan/Schoar Public Market Equivalent (KS PME)	Kaplan, Schoar	- Measures the wealth multiple effect of investing in a fund versus the index. - Can be interpreted as a market-adjusted equivalent of Total Value to Paid-In-Capital (TVPI). - Always defined.	- Timing of cash flows is ignored. - Not an annualized measure.
Public Market Equivalent Plus (PME+)	Rouvinez	- Identical residual values. - Liquidating reference portfolio.	- Cash flows are not perfectly matched. - Inflated/deflated IRR spreads. - Not always defined. - No exact solution.
Modified Public Market Equivalent (mPME)	Cambridge Associates	Liquidating reference portfolio.	- Inflated/deflated IRR spreads. - Sensitive to pricing errors and under- or outperformance. - No exact solution.

Method	Authors	Advantages	Weaknesses
Direct Alpha	Gredil, Griffiths, and Stucke	Rate of return of outperformance, defined as the IRR computed from the PE fund's cash flows discounted using the returns of a benchmark portfolio.	- Using alpha (annualized excess return) to calculate returns has its limitations—it cannot be used to compare different investment portfolios or asset types. - The definition of risk premium is neglected. - Benchmarking and computation of actual performance are not possible.
PERACs Alpha	Approach initially used by Phalippou and Gottschalg (2009) in a research paper to measure the performance of private equity funds and later referred to as the PERACs alpha.	Return relative to the opportunity cost of not investing in the public market.	- Estimation of the duration. - Opportunity cost approximation. - Benchmarking and computation of actual performance are not possible.
Modified Dietz	The original Dietz method was introduced in 1966 and later revised by weighting the cash flows by the amount of time outstanding.	- Approximation of time-weighted return when intra-period pricing information is unavailable. - Well established metric and formally approved method recommended by the CFA Institute in its Global Investment Performance Standards (GIPS®) Handbook.	- Provides the return per unit of average cash outflow. - A linear approximation of IRR that does not ignore or reduce the effect of cash flows. - Modified Dietz's error increases as cash flows grow larger. - Geometric compounding of intra-period returns generates biased results.
DARC	Saccone	- Time-weighted return measure. - Formally correct, accurate, and always defined. - Meets the additivity properties to infer unbiased fund-level return. - Enables performance benchmarking at multi-asset class portfolio level.	- Modular approach with complex calculations to deliver return estimation accuracy. - Sensitivity to net duration is overcome when the fully diluted version of DARC measure is used.

Source: Saccone M. and A. Gentilini (2024).

DARC is the rate of return the invested capital produces over time for the net duration — the difference between the duration of Distributions (DurD) and the duration of Contributions (DurC) — while Horizon DARC is the actual since-inception annualized rate of return that investors earn for a given time horizon. As it is calculated taking into account the net duration, which may differ among private equity fund peers, any performance comparison across funds using DARC may be misleading.

Conversely, Horizon DARC returns unbiased performance figures in a peer group analysis and across different asset classes.

Exhibit 5 below shows the individual and pooled, i.e. average, performance of three PE funds. DARC, Horizon DARC, IRR, and TVPI are all calculated as of the valuation date of December 31, 2022. In the table, negative figures for contributions are in blue and positive readings for distributions are in black.

The pooled case is simply the arithmetic sum of the cash flows, i.e. contributions and distributions, of the three investments.

Although IRR and DARC readings appear to be quite similar, only DARC embeds the timespan tag as defined by the net duration (1,483 days or 4.06 years in the pooled example). DARC is a forward measure to the extent that the period as of an investor will start earning the PE return starts at a time in the future, as defined by the duration of the contribution. Then, the investor will be able to earn the PE return for the period given by the net duration, starting on the forward date of the duration of the contribution. In the pooled example in Exhibit 5, an IRR of 12.93%, which—it is worth stressing once again—is not an annualised return measure and is valid only at the time of calculation, corresponds to a since-inception annualized rate of return of 4.18%, as defined by Horizon DARC.

It is worth noting that, similar to IRR, DARC is sensitive to GPs' policies aimed at increasing debt-fueled dividend payments as it is influenced by debt financing techniques that postpone contributions and anticipate distributions.

Also, being a fully-diluted measure to the extent it factors in the committed capital including the undrawn capital, an unbiased benchmarking of DARC with public market indexes, which are fully invested, would require the creation of a diluted version of the public benchmark.

In the next sections, the performance measurement in a time-weighted context will be taken into consideration to see whether the various metrics used to compute private equity performance can play a role in working out both the risk premia conundrum and indexing in private equity.

Exhibit 5 – Individual and Pooled Performance of Three Sample PE Funds

Investments		Investment 1		Investment 2		Investment 3		Pooled
	2015-05-05	-10.00	2015-05-05		2015-05-05		2015-05-05	-10.00
	2016-02-08		2016-02-08	-20.00	2016-02-08		2016-02-08	-20.00
	2017-01-09	-10.00	2017-01-09		2017-01-09	-40.00	2017-01-09	-50.00
	2018-04-09	-5.00	2018-04-09		2018-04-09		2018-04-09	-5.00
	2019-05-07		2019-05-07	-10.00	2019-05-07		2019-05-07	-10.00
	2019-09-09	25.00	2019-09-09		2019-09-09		2019-09-09	25.00
	2020-03-09		2020-03-09		2020-03-09	10.00	2020-03-09	10.00
	2020-09-14	10.00	2020-09-14		2020-09-14		2020-09-14	10.00
	2020-11-17		2020-11-17	5.00	2020-11-17	30.00	2020-11-17	35.00
	2021-03-08		2021-03-08	43.00	2021-03-08		2021-03-08	43.00
	2021-10-19		2021-10-19		2021-10-19	5.00	2021-10-19	5.00
	2022-05-17		2022-05-17	23.00	2022-05-17	5.00	2022-05-17	28.00
Valuation Date	2022-12-31							
Weight		26.38%		31.38%		42.24%		100%
Duration C (days)		2,409.00		2,615.00		2,566.00		
Duration D (days)		3,645.00		4,218.00		4,012.00		
Net Duration (days)		1,236.00		1,603.00		1,446.00		1,483.00
Synth Contr @DurC	2016-08-05	-24.93	2017-02-27	-29.75	2017-01-09	-40.00	2016-12-14	-94.66
Synth Distr @DurD	2019-12-24	35.08	2021-07-19	70.98	2020-12-25	50.00	2021-01-05	156.18
Horizon DaRC		2.93%		7.18%		1.98%		4.18%
Annualised since inception								
DaRC		10.61%		21.90%		5.79%		13.12%
IRR		10.30%		20.90%		5.81%		12.93%
TVPI (x)		1.40		2.37		1.25		1.64

Source: Saccone M. and A. Gentilini (2024).

3. Beta vs. alpha: the risk premia conundrum

Private equity is generally considered an asset class delivering superior returns compared with public equity markets. The empirical evidence is mixed, with most recent research suggesting that PE performance is broadly in line with public markets.

Alpha estimation from PE cash flows remains methodologically challenging, due to a lack of good quality data and smoothed returns, often calculated in a biased money-weighted computational framework. Further, the estimation of PE alpha would require, first, the computation of PE funds beta, i.e., the sensitivity of returns relative to the systematic risk of the market portfolio. However, among academics and practitioners there is a lack of consensus on the appropriate public market benchmarks to consider for the analysis, with performance findings remaining highly sensitive to the underlying index selected for the different measurement periods. Also, private equity investing is highly leveraged, while that is not the case for public market benchmarks. Further, private equity smoothed returns minimize the true economic risk of the investment. Since private equity funds are illiquid, there is a lack of mark-to-market in absence of daily market prices, resulting in muted volatility readings of the returns of a private equity fund.

The limitations of the PME methods but the direct alpha stem from the fact that they are unable to separate the alpha (the excess return of the PE fund) from the beta (i.e., the listed benchmark return, calculated with reference to the cash flows of the PE fund). At the same time, the claimed unbiasedness of the Direct Alpha method to get the IRR by converting the cash flows occurred in each year to a present value at the listed benchmark return and then considering these as having occurred at the year in question is questionable. Both PME and Direct Alpha metrics share the same limitation, i.e. their inability to compute the actual performance of a private equity invested portfolio.

Based on CAPM, the equation of alpha can be written as:

$$\text{Alpha} = \text{PE Return} - [\text{Risk-free rate} + (\text{Market Benchmark Return} - \text{Risk-free rate}) * \text{Beta}],$$

where:

$$\text{Alpha} = \text{Skill (portfolio selection)} + \text{Illiquidity Premium} + \text{PE risk premia}$$

We sustain the argument that the illiquidity premium, being an additional return component that is intended to compensate an investor for holding an asset that is not highly liquid, is hardly measurable and is strictly dependent on time, as represented by the duration. In fact, the capital invested in a private equity fund is generally “locked” for a typical period of 5 to 10 years, if not more.

What if, instead, the illiquidity premium turns into an illiquidity discount, meaning that investors give up a fraction of the expected return for much less liquid assets? In other terms, what’s the next implication of extreme illiquidity and pricing opacity being a feature not a bug as AQR Capital Management’s Cliff Asness has argued?⁶ *“Well, you pay up in price (and give up in expected return) for features you value (not bugs you can’t stand). Attractive smoothness of returns may not come for free. If illiquidity is more positive than negative to many investors, it could easily mean paying a higher price and accepting a somewhat lower return to obtain it... I think it’s entirely possible that investors are accepting a discounted expected net return ... for the privilege of not being told the prices. There really may be an illiquidity discount (in expected returns) with the opposite sign from the illiquidity premium we’ve always assumed.”*

How has private equity historically performed in institutional portfolios?

While Yale University endowment has stopped reporting returns on its private equity portfolio, CalPERS has disclosed as of December 31, 2024,

6 Asness C. (2019).

a since-inception net IRR of 11.1% and a TVPI of 1.5x for its private equity program, indicating returns in line with public market readings. In mid-July, CalPERS reported a preliminary net investment return of 11.6% for the 12-month period ending June 30, 2025. Public equity investments, which comprise approximately 39% of the fund, outperformed all other asset classes with an estimated 16.8% return. Private equity earned a lower 14.3% return for the same period, with private debt delivering an estimated return of 12.8%.

It's a fallacy that private equity's historical performance computed with IRR outperformed public market indices' returns, as long as IRR is claimed to measure the aggregate annual compounded returns generated by a fund's investments over a holding period. As we highlighted above, IRR is not a time-weighted actual rate of return, even less it can be compounded.

A straightforward way to show that IRR is unlikely to represent a rate of return is to compute the amount of capital investors would earn at the end of the investment period if they had realized a rate of return equivalent to the IRR that is reported.

Amongst others, quoting from KKR's 10/K 2024 annual report filed on Feb. 28, 2025 (available at the link https://ir.kkr.com/sec-filings-annual-letters/sec-filings?page_no=2) *"From our inception in 1976 through December 31, 2024, our Private Equity and Real Assets investment funds with at least 24 months of investment activity generated a cumulative gross IRR of 25.5%, compared to the 12.2% and 9.5% gross IRR achieved by the S&P 500 Index and MSCI World Index, respectively, over the same period, despite the cyclical and sometimes challenging environments in which we have operated."* Through a simple computation, an initial investment of \$100 million in KKR in 1976, without any additional contributions, at a 25.5% compounded return would have grown, over an investment period spanning 48 years, to an

unrealistic \$5.431 trillion at the beginning of 2025 [$\$100 \text{ mln.} \cdot (1+25.5\%)^{48}$], which is no less than the GDP of Japan.

The persistence of performance, which refers to the ability to consistently pick outperforming portfolio managers, has long been investigated in mutual funds that invest in public markets, with weak-to-negative results.

As for private equity, Kaplan and Schoar⁷ found that *"On average, buyout (LBO) fund returns net of fees are slightly less than those of the S&P 500; venture capital (VC) fund returns are lower than the S&P 500 on an equal-weighted basis, but higher than the S&P 500 on a capital weighted basis."* The authors documented a substantial persistence in LBO and VC fund performance. *"General partners (GPs) whose funds outperform the industry in one fund are likely to outperform the industry in the next and vice versa. We find persistence not only between two consecutive funds, but also between the current fund and the second previous fund."*

Analysing a sample of 1,400 U.S. buyout and venture capital funds using a new data set from Burgiss, R. Harris, T. Jenkinson and S. Kaplan⁸ find that for private equity, *"the outperformance versus the S&P 500 averages 20% to 27% over the total life of the fund and more than 3% annually. Venture capital funds outperformed public equities in the 1990s, but underperformed in the 2000s."*

Working on high quality cash-flow data from Burgiss's large sample of institutional investors (as of December 2020), a more recent study⁹ indicates that the persistence of buyout funds performance is weakening, and since 2000 there is *"little evidence"* of it. Conversely, the authors *"continue to find persistence for VC funds though it declines post-2000."*

Illmanen, Chandra and McQuinn¹⁰ found very similar results. In their analysis, the authors suggest that

7 Kaplan, S. N., A. Schoar (2005).

8 Harris, R. S., T. Jenkinson, and S. Kaplan (2014).

9 Harris, R.S., T. Jenkinson, S. N. Kaplan, and R. Stucke (2023).

10 Illmanen, A, S. Chandra, and N. McQuinn (2020).

“private equity does not seem to offer as attractive a net-of-fee return edge over public market counterparts as it did 15–20 years ago, from either a historical or forward-looking perspective.” And “Our estimates display a decreasing trend over time, which does not seem to have slowed the institutional demand for private equity. We conjecture that this is due to investors’ preference for the return-smoothing properties of illiquid assets in general.”

In a recent paper, using a comprehensive MSCI Burgiss dataset, focusing on 2000–2019 vintage funds Phalippou¹¹ argues that the PME stands at 0.99—identical to that reported in a previous study¹²—implying that, on average, private capital funds performed in line with the S&P 500 over the same period. The author advocates a standardisation and transparency of benchmarking practices since the argument of a persistent outperformance is largely a construct, sustained by selective benchmarking, and data filtering.

4. Will indexing foster private equity democratization, paving the way for investability?

The definition of “benchmark” is deeply rooted in the global standards set out in the *IOSCO Principles for Financial Benchmarks*¹³, which were published in July 2013.

The broad definition of benchmark set out in the EU Benchmark Regulation (Regulation (EU) 2016/1011) refers to “Any index by reference to which the amount payable under a financial instrument or a financial contract, or the value of a financial instrument, is determined, or an index that is used to measure the performance of an investment fund with the purpose of tracking the return of such index or of defining the asset allocation of a portfolio or of computing the performance fees.” By virtue of the application of a rules-based, robust, and accurate methodology, which is transparent and capable of validation, allowing calculation of the benchmark

in the widest set of possible circumstances, the resulting benchmark should be “reliable and representative of the market or economic reality that the benchmark is intended to measure.”

Benchmarking reflects a statement of transparency, product governance and investor protection, accuracy, and representativeness. The adoption of unbiased benchmarking standards for private market investments within pension plans and institutional investors’ portfolios allow unbiased comparability with public market assets. That has become increasingly critical within institutional investors’ allocations, since private equity is one of the several alternative assets gaining relative share in pension plans’ portfolio allocations since early 2000.

A question arises here, given the clear direction in which the regulation is heading. Do existing benchmarks represent either the market or the economic reality of private market investments for Limited Partners (LPs)? Certainly not. Existing benchmarks that track unlisted private market assets build upon money-weighted metrics, which are atemporal by construction, imply unrealistic reinvestment or refinancing assumptions, and do not conform with financial market standards of additivity and averaging.

Very often, in the private equity space, the term ‘benchmarks’ is used in a broader sense to include peer group analyses and ratios that are constructed to allow intra and cross-asset class comparisons of various performance metrics. This is the case of certain ratios or metrics, like the so-called Public Market Equivalent or Alpha measures, or the most traditionally referenced since-inception IRRs (or Horizon IRR), which has been compounded in the design of the index. In particular, Horizon IRRs cannot be averaged out and geometrically compounded to derive annualised returns.

In many instances, performance measures such as quartiles, averages or annualised measures of IRRs are derived from calculations that do not

11 Phalippou, L. (2025).

12 Phalippou, L. (2022).

13 <https://www.iosco.org/library/pubdocs/pdf/IOSCOPD415.pdf>

fulfil mathematical and statistical accuracy. Generally speaking, those metrics, which are money-weighted and do not reflect the best practices for the construction of indices in a time-weighted fashion, underlie the construction of benchmarks.

In other cases, such as the MSCI's Burgiss Private Capital Indexes, benchmarks' design relies on the Modified Dietz (MDietz) method. As we highlighted earlier in the exhibit summarising advantages and weaknesses of various private equity valuation metrics, MDietz is an approximation of time-weighted return that does not ignore or reduce the effect of cash flows. MDietz delivers the return (per unit) of the time-weighted average of cash flows, assuming a linear movement of asset prices during the measurement period. As a result, Modified Dietz's error increases as cash flows grow larger, with geometric compounding of intra-period returns generating biased results.

In the construction of private market indexes, the input cash flows (contributions and distributions) and net asset values data used to process private equity valuations should be the same official data published in the quarterly unaudited and annual audited fund financial statements produced by the GPs for their LPs. In order to ensure data accuracy and comprehensiveness, input data could be provided by the custodian or the depositary bank of the private equity fund assets. Regulatory filings, Freedom of Information Act (FOIA) requests, manager surveys, or press "scrapings" should not be used to gather information.

A potential bias in matters of fact arises from GPs' reported NAVs, which is a key data element in private equity performance measurement, since those may well be only estimates of true NAVs, leading to understated risk and overstated risk-adjusted returns¹⁴. In fact, among practitioners, it is generally acknowledged that illiquidity and incentive considerations can lead reported NAVs to be smoothed versions of true NAVs.

For the reasons noted above, nowcasted NAVs that adjust for NAV smoothing should be taken into account in index construction to lower autocorrelation in returns and compute unbiased performance readings.

As it fosters valuation transparency, rules-based and regulatory compliance indexing, with full disclosure of the index constituents, paves the way for increased market access by retail investors. A daily nowcasting of private fund valuations, which is only possible in a context of time-weighted performance measurement, underpins the robustness of the benchmarks' design. By that way, indexing contributes to eliminate private market information asymmetries and deliver a bridge of trust between GPs and institutional and retail investors.

Accurate and unbiased benchmarking can unlock the full potential of a secondary digital marketplace facilitating price discovery by LPs and investors, risk transfer transactions, and improving platform efficiency via an increased liquidity pool of assets.

At the same time, indexing fosters the adoption of unbiased benchmarking standards within asset owners' global portfolios, paving the way for the launch of passive investment solutions pegged to benchmarks that fulfil regulatory standards of accuracy, representativeness and unbiasedness. The relentless drive to new regulatory requirements is expected to underpin a progressive democratization wave in private markets, where benchmarking is expected to constitute a critical element of the private asset market infrastructure.

5. Secondaries market efficiency: challenges and opportunities

Secondary deal activity in private markets surged in 1H 2025, eclipsing the prior record of \$67.71bn in the same period last year¹⁵. Transaction volume climbed to an estimated \$102.23bn at the end of June 2025, with a 51% increase year-on-year.

¹⁴ For a thorough discussion on the topic please refer to Getmansky, M., A. W. Lo, and I. Makarov (2004) and Coutts, S., A. S. Gonçalves, and A. Rossi (2024).

¹⁵ Setter Capital 1H 2025 Survey, UBS Private Funds Group 1H 2025 Secondary Market Report.

The projected full-year 2025 volume stands at \$176.25bn. Fund secondaries led the way in 1H 2025, rising 56.3% year-over-year to \$59.49bn, while direct secondaries increased 44.1% to \$42.74bn. The market is expected to maintain a near-even split over the next three years, with 55.7% in fund secondaries and 44.3% in directs.

LP-led transactions were fuelled by persistent liquidity pressures and portfolio rebalancing needs amid budgetary constraints and regulatory shift.

As the LPs' pendulum has swung in recent years, progressively focusing on DPIs, with GPs in turn focusing on exits, NAV loans and continuation vehicles are PE fund managers' response to appease investors.

Private equity fund liquidity can be hardly planned using traditional secondaries, which are procyclical. When distributions become uncertain, liquidity is costlier for the seller and riskier for the buyer. Buyers potentially face adverse selection and sellers may well enter the market at penalizing discounts.

In the academic literature two main explanations are found for secondary market discounts: 1) compensation for liquidity provisions: when funding liquidity is low, LPs may be forced to sell their stakes for cash while potential buyers are also strapped

of cash or constrained to borrow; 2) compensation for asymmetric information: expecting that incumbent LPs will accept bids that are close to NAV values because they privately discover that their fund's reported NAV is too high, bidders respond with discounted bids.

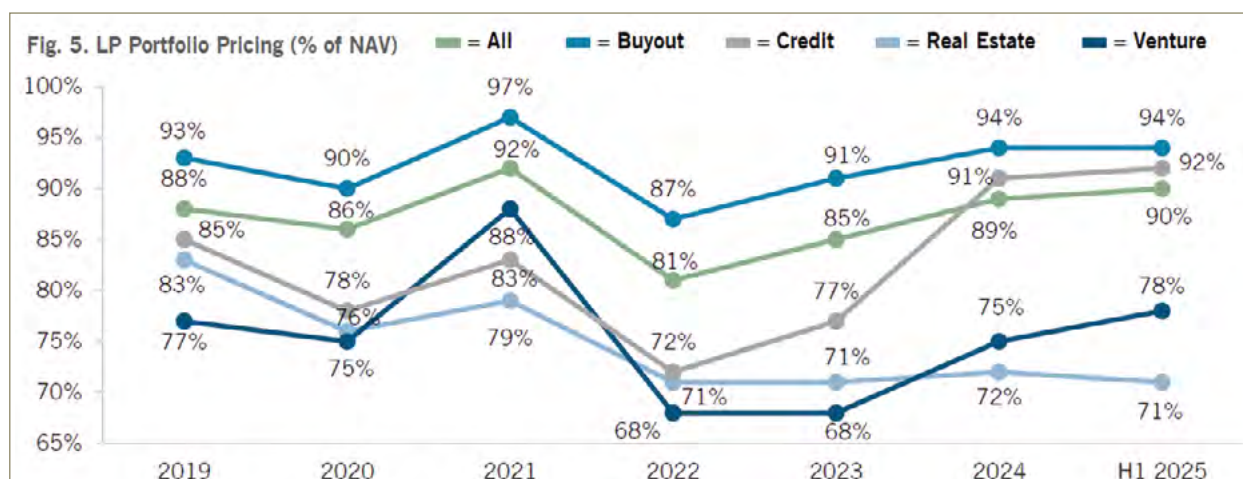
According to Jefferies H1 2025 Global Secondary Market Review, despite volatility in H1 2025 — particularly following the imposition of tariffs and subsequent market disruption around “Liberation Day”— pricing continued its upward trajectory, with average pricing reaching 90% of NAV (or 10% discount) for all strategies and approaching levels last seen in 2021.

(Graphic, Exhibit, 6)

In the current market scenario, a robust time-weighted measure in line with the one reviewed earlier in the article, which computes an actual rate of return for unlisted private equity funds, is the only metric that makes the calculation of daily nowcasted NAVs and drawdowns possible.

Nowcasted NAVs overcome the limitations of quarterly valuation standards, stale NAVs, and muted volatility readings, facilitating price discovery while adding objectivity to NAVs discount calculations, allowing fair fund valuations, and decreasing the risk of adverse selection. Also, nowcasted NAVs

Exhibit 6 – Secondaries Market – LP Portfolio Pricing (% NAV)



Source: Jefferies H1 2025 Global Secondary Market Review

allow the testing of the accuracy of the marked-to-market NAV in real time, with a view to fostering greater transparency and increased market access to both institutional and retail investors.

At the same time, nowcasted NAVs pave the way for an efficient secondaries market where common standards and unbiased performance measurement in a time-weighted context facilitate seamless transferability of illiquid assets across diverse spot and forward product solutions, reflecting broader investor confidence in private market valuations.

In perspective, an ecosystem where DLT (Distributed Ledger Technology) Registry Operators, which enable the tokenization of financial instruments, interact with GPs, LPs, financial intermediaries, and regulators under the umbrella of a digital infrastructure fosters the development of a blockchain-enabled private equity secondaries market.

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Free-riding y dilema del prisionero en las tomas de control mediante OPAs

(Free-riding and the prisoner's dilemma in takeover bids)

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Resumen

En la dinámica de las ofertas de adquisición se observan distintos problemas como el *free riding* o el *dilema del prisionero*. Algunos modelos plantean la necesidad de plantear las ofertas de manera parcial o en dos tramos. La normativa española obliga a que las OPAs obligatorias se formulen por la totalidad de los valores de la sociedad. En las empresas de reciente creación se establecen distintas cláusulas estatutarias con el fin de proteger a los accionistas minoritarios en los procesos de fusión y adquisición.

Palabras clave: Tomas de control, fusiones y adquisiciones, ofertas públicas de adquisición, coste de agencia, comportamiento de oportunismo, dilema del prisionero, legislación estatutaria.

Abstract

Several problems arise in the dynamics of a takeover bid, such as free riding and the prisoner's dilemma. Some models propose the need to make a partial or a two-tier bid. Spanish regulations require mandatory takeover bids to be formulated for all of the company's securities. Furthermore, in newly created companies, various bylaw clauses are established to protect minority shareholders in merger and acquisition processes.

Keywords: Takeovers, mergers and acquisitions, takeover bids, agency cost, opportunistic behavior, prisoner's dilemma, statutory law.

JEL: G32 y G34

1. Introducción

Las tomas de control son operaciones cuya dinámica implica distintas reacciones y pone en relieve los conflictos de interés que se pueden plantear entre los distintos actores que conforman la realidad corporativa de una empresa.

Por una parte, las tomas de control suponen un cambio en el control de la empresa, que sustituirá a la dirección y a los accionistas mayoritarios. Por otra parte, la oferta de adquisición representa una transacción económica, en la cual, las acciones de la empresa cambian de manos. En esta transacción económica, tanto accionistas mayoritarios como accionistas minoritarios se encuentran ante la encrucijada entre vender o mantener las acciones. Esta disyuntiva trae consigo distintas dinámicas y problemáticas que pueden alterar la probabilidad de éxito de la toma de control.

En el Real Decreto 1066/2007, de 27 de julio, sobre el régimen de las ofertas públicas de adquisición de valores, se contemplan unos supuestos que suponen la toma de control de una sociedad cotizada y en ese caso establece la obligatoriedad de formular una OPA sobre la totalidad, descartándose la modalidad de OPA parcial en el caso de las OPAs obligatorias¹.

Las empresas de nueva creación pueden incluir cláusulas estatutarias con el fin de establecer una respuesta a una eventual adquisición de la empresa por parte de una gran empresa. En este sentido, se pueden aprobar unas cláusulas estatutarias, como las drag-along y tag-along², las cuales, influirán en el proceso de adquisición, teniendo en cuenta que el Real Decreto 1066/2007 no se

aplica sobre empresas no cotizadas, puesto que su ámbito de aplicación se extiende sobre las sociedades que cotizan en mercados regulados o en sistemas multilaterales de negociación.

En este artículo vamos a analizar las primas ofrecidas en las tomas de control mediante OPA. Vamos a estudiar las problemáticas que surgen en las dinámicas de toma de control mediante adquisición y las cláusulas estatutarias que se emplean con más frecuencia para proteger a los accionistas minoritarios en las empresas de nueva creación.

2. Tipos de toma de control

Según la literatura económica, las plusvalías experimentadas por las empresas objetivo de las tomas de control pueden tener orígenes diversos^{3 4}. Existen tres tipos de toma de control: las pugnas de votos, la adquisición de acciones (mediante compras de grandes paquetes, mediante oferta de adquisición o mediante compra en el mercado abierto) y la fusión (Manne, 1965).

Las principales formas de toma de control son las fusiones y las ofertas de adquisición. Mientras que las fusiones suponen la aprobación del consejo de administración de la empresa objetivo y por lo tanto, son de carácter amistoso, las ofertas de adquisición pueden ser amistosas⁵ u hostiles⁶, según cuenten con la aprobación del consejo de administración de la empresa objetivo o se encuentren con su oposición.

1 El Real Decreto 1066/2007, de 27 de julio, sobre el régimen de las ofertas públicas de adquisición de valores se aplica sobre las sociedades que cotizan en mercados regulados o en sistemas multilaterales de negociación.

2 Las cláusulas drag-along obligan al accionista minoritario a vender a un precio equitativo, mientras que las cláusulas tag-along obligan al adquirente a extender a la totalidad de las acciones su oferta de compra.

3 Como son las economías de escala, las economías de alcance, las economías de integración vertical, mejoras de gestión, entrada de un equipo directivo más eficiente, combinación de recursos complementarios entre empresa adquirente y empresa adquirida, ventajas fiscales como la compensación de bases imponibles negativas y menores costes de financiación,

4 Distintos manuales analizan las ventajas (e inconvenientes) de los procesos de fusión y adquisición (Cuervo García, 1999)

5 Las tomas de control amistosas se caracterizan por tener que pagar las rentas y prebendas de la dirección, para compensar sus beneficios privados de control previos a la operación.

6 Las tomas de control hostiles se caracterizan por (Schnitzer, 1996):

- Tener altos costes de publicidad, banqueros de inversión y abogados.
- Tener que superar las barreras anti-toma de control.
- Tener que pagar primas más altas.

3. Hipótesis de información e hipótesis de sinergia

La evidencia empírica demuestra de manera significativa la prima positiva que reciben los accionistas de las empresas objetivo en las operaciones de fusión y adquisición⁷ ⁸. Una de las causas que explica el nivel de primas puede ser el hecho de que la empresa objetivo puede valer más que su precio de cotización en el mercado bursátil⁹ (Grossman & Hart, 1988) Según Grossman y Hart (1981), la adquisición señala la subvaloración de las acciones. El nivel de primas está negativamente relacionado con el ciclo de negocio, lo cual, resulta ser consistente con la hipótesis de subvaloración (Nathan & O'Keefe, 1989)

La hipótesis de información está relacionada con la hipótesis de subvaloración e implica que las empresas objetivo de ofertas de adquisición no exitosas mantienen posteriormente los rendimientos anormales experimentados en el anuncio de la toma de control. Esta hipótesis tiene dos formas: la primera encuentra su justificación en la subvaloración de las acciones antes de la oferta de adquisición, mientras que la segunda encuentra su justificación en que la dirección de la empresa objetivo se vuelve más eficiente después de una oferta de adquisición fracasada¹⁰. Distintos estudios tratan de testar la hipótesis de información analizando si los rendimientos anormales que experimentan las empresas objetivo se mantienen

en caso de fracasar la toma de control. En este sentido, distintos autores defienden con sus resultados la hipótesis de información (Brous & Kini, 1993; P. y R. R. Dodd, 1977).

En contraposición, la hipótesis de sinergia constituye la hipótesis contraria a la hipótesis de información y supone que las ganancias están condicionadas al éxito de una oferta de adquisición y por tanto, después de una oferta de adquisición fracasada, el mantenimiento de las cotizaciones de la empresa objetivo a niveles superiores a los anteriores a la oferta de adquisición sólo se puede justificar por la expectativa de una nueva oferta de adquisición (Asquith, 1983; Bradley et al., 1983; Choi, 1991; Davidson et al., 1989; Fabozzi et al., 1988; Jarrell, 1985; Pound, 1988)

4. La hipótesis de recurso único y el papel disciplinario de la toma de control

Sin embargo, no existe una evidencia clara sobre el signo del resultado de la operación para los accionistas de la empresa adquirente y gran parte de las investigaciones realizadas no logran obtener resultados significativos de uno u otro signo. Mientras que algunos autores¹¹ defienden que las empresas adquirentes experimentan rendimientos anormales negativos, otros autores¹² o bien no observan rendimientos distintos de cero, o bien, observan ren-

7 Así lo demuestran diversos autores (Asquith, 1983; Cornett & De, 1991; Dennis & McConnell, 1986; P. Dodd, 1980; P. y R. R. Dodd, 1977; Eger, 1983; Elgers & Clark, 1980; Firth, 1978; Franks, 1977; Halpern, 1973; Harris & Franks, 1989; Jensen et al., 1983; Langestieg T.C., 1978; Madden, 1981; Malatesta, 1983; Mandelker, 1974; Martynova & Renneboog, 2008; Renneboog & Vansteenkiste, 2019; Wolken & Hannan, 1989)

8 También se observan rendimientos anormales positivos para las empresas objetivo de tomas de control en el mercado corporativo español (Díaz M.T., 1995; Eguidazu S., 1998; Fernández A.I. y Gómez S., 1999; Fernández M. y García C.J., 1995; Lozano M.B., 1994; Ocaña C., 1997)

9 La subvaloración de las acciones no contradice a la hipótesis de eficiencia de mercado en su nivel intermedio, puesto que, la hipótesis de eficiencia supone que el mercado tiene en cuenta toda la información pública disponible al valorar la acción y la información que posee el adquirente puede ser privada.

10 Con respecto a los efectos disciplinarios en la empresa objetivo derivados del rechazo de una toma de control, se observa una rotación directiva del 34% en los dos años posteriores a los intentos no exitosos de toma de control (Denis & Serrano, 1996). Dicha rotación directiva se encuentra concentrada en empresas que experimentan un pobre desempeño y en las que grandes accionistas externos obtienen una importante participación durante el curso o inmediatamente después del intento de toma de control. Las empresas con una alta dirección renovada tienen mayor probabilidad de acometer reestructuraciones, sobre todo, cuando hay accionistas con grandes participaciones. Estas reestructuraciones incrementan el precio de las acciones por encima de los niveles anteriores al intento de toma de control. Por otra parte, se observa un incremento en el apalancamiento con posterioridad a los intentos fracasados de toma de control (Safieddine & Titman, 1999).

11 (Bühner, 1991; P. Dodd, 1980; Firth, 1980; Malatesta, 1983; Moeller et al., 2005; Tuch & O'Sullivan, 2007; Wolken & Hannan, 1989)

12 (Asquith et al., 1983; Cai & Sevilir, 2012; Cornett & De, 1991; Desai & Stover, 1985; Eckbo, 1986; Eckbo & Langohr, 1989; Elgers & Clark, 1980; Halebian et al., 2009; Halpern, 1973; Harris & Franks, 1989; Kang et al., 2000; Langestieg T.C., 1978; Limmack & McGregor, 1995; Loderer & Martin, 1990; Mikkelsen & Ruback, 1985; Pettway & Yamada, 1986; Schipper & Thompson, 1983; Swary, 1981; Trifts & Scanlon, 1987; Yagil, 1993)

dimientos positivos. En el caso del mercado español no se observan resultados significativamente distintos de cero¹³.

El hecho de que las ganancias de la fusión u oferta de adquisición sean capturadas casi exclusivamente por los accionistas de la empresa objetivo parece defender la hipótesis de que la empresa objetivo posee un recurso único¹⁴ y parece también defender la hipótesis de competencia entre los adquirentes en el mercado de adquisiciones de empresas¹⁵.

Halpern (1973) atribuye el hecho de que el valor del factor único no esté reflejado previamente en el precio de la acción de la empresa adquirida a que:

- Ese factor único no se desarrolle con cualquier empresa y el evento de toma de control hace que las ganancias se realicen.
- La dirección de la absorbida sea ineficiente y la toma de control realice las esperanzas que tenían los accionistas.

En este sentido, si la empresa objetivo se caracteriza por un mal desempeño se caracterizará por unos rendimientos anormales negativos en el período previo a la toma de control¹⁶. Mandelker (1974) y Malatesta (1983) atribuyen estos malos resultados previos a una mala gestión de la dirección de la empresa objetivo. Por el contrario, Langetieg (1978), empleando un modelo de dos factores (el rendimiento del mercado y el rendimiento sectorial) no atribuye dichos malos resultados a una mala dirección de la empresa absorbida puesto que el grupo de control sectorial de la empresa objetivo que no se fusiona también refleja residuos negativos. En el mismo sentido, las tomas de control son precedidas de shocks tecnológicos e industriales (Martynova & Renneboog, 2008).

Por el contrario, otros autores^{17 18} defienden que las empresas objeto de OPA no tienen un mal desempeño previo. Esto lo podemos atribuir a que no todas las tomas de control deben ser disciplinarias y por lo tanto, existen otras fuentes de ganancia que pueden explicar las tomas de control, como por ejemplo la posesión de un recurso único (Halpern, 1973).

Distintos autores¹⁹ defienden que los rendimientos anormales positivos en la empresa adquirente años antes de la toma de control reflejan un buen desempeño previo, probablemente debido a una buena gestión de la dirección.

El mal desempeño previo de la empresa objetivo unido al buen desempeño previo de la empresa adquirente apoyaría la hipótesis de que las fusiones y sobre todo las ofertas de adquisición²⁰ juegan un importante papel disciplinario de la dirección de la empresa objetivo, constituyendo la toma de control un vehículo mediante el cual se sustituyen direcciones ineficientes por direcciones eficientes²¹.

5. Las OPAs de exclusión y el coste de agencia

El mal desempeño previo de algunas empresas objeto de OPA puede obedecer en parte al coste de agencia y este coste de agencia puede mitigarse con las OPAs de exclusión. En este sentido, las OPAs de exclusión consisten en la recompra de las acciones que quedan en circulación y la salida de la empresa del mercado bursátil. Estas operaciones reducen el coste de agencia al mejorar el seguimiento de la dirección

13 (Fernández A.I. y Gómez S., 1999; Fernández M. y García C.J., 1995; Lozano M.B., 1994)

14 (Asquith, 1983; Halpern, 1973; Mandelker, 1974)

15 (Asquith, 1983; Limmack, 1991; Mandelker, 1974)

16 (Asquith, 1983; Langetieg T.C., 1978; Malatesta, 1983; Mandelker, 1974; Palepu, 1986)

17 (Carleton et al., 1983; P. y R. R. Dodd, 1977)

18 Dodd y Ruback (1977) defienden que las empresas objetivo de ofertas de adquisición exitosas experimentan rendimientos anormales positivos en los 12 meses anteriores y Carleton, Guilkey, Harris y Stewart (1983) defienden que la probabilidad de ser adquirido se incrementa cuando mayor es la rentabilidad.

19 (Asquith, 1983; Borg et al., 1989; Langetieg T.C., 1978; Mandelker, 1974)

20 La oferta de adquisición constituye un medio más apropiado para disciplinar a la dirección de la empresa objetivo, puesto que la fusión, al requerir el consentimiento del consejo de la empresa objetivo, implica un carácter amistoso (Huang & Walkling, 1987) Según Huang y Walkling (1987), "las fusiones permiten el pago de la prima de control directamente a la dirección de la empresa en la forma de contratos post-fusión".

21 (Asquith, 1983; Fama, 1980; Mandelker, 1974; Manne, 1965, 2019)

y hacen posible un mayor alineamiento entre los intereses de la dirección y los intereses de los accionistas, lo cual, supondrá que se realizarán grandes beneficios derivados de la corrección del coste de agencia²². El mayor alineamiento entre los intereses de la dirección y los de los accionistas derivado de una toma de control resulta especialmente importante en el caso de que la toma de control suponga la exclusión de la cotización o/y un LBO²³. Ambas operaciones implicarán la salida de la sociedad de la Bolsa y traerán una mayor concentración en la propiedad del capital de la empresa.

Distintos autores han estudiado las OPAs de exclusión en España. Tenemos la monografía de la CNMV (Baena Tovar, 2006) y un estudio empírico reciente (Recondo Porrúa, 2023), así como trabajos que analizan la dimensión regulatoria (Serrano Acitores, 2013; Varela Vargas, n.d.)²⁴.

6. La oferta a la totalidad y el *free-riding*

En el Real Decreto 1066/2007, de 27 de julio, sobre el régimen de las ofertas públicas de adquisición de valores, se contemplan unos supuestos que suponen la toma de control de una sociedad cotizada y en ese caso establece la obligatoriedad de formular una OPA sobre la totalidad, descartándose la modalidad de OPA parcial en el caso de las OPAs obligatorias (Real Decreto 1066/2007, 2007). La obligatoriedad de formular una OPA a la totalidad es una manera de extender la prima ofrecida a todo el colectivo de accionistas, protegiendo así a todos los accionistas, con especial cuidado de proteger los intereses de los accionistas minoritarios.

Cuando se presenta una oferta de adquisición se suele hacer con una prima atractiva para que tenga éxito. Sin embargo, el precio ofrecido en la oferta de adquisición puede ser percibido como una señal de que la empresa objetivo tiene un valor real mucho más elevado que lo que cotizaba en Bolsa antes de la operación. Como consecuencia, para el éxito de la OPA es importante que la asimetría de la información entre el adquirente y el accionista de la empresa objetivo no sea elevada (Hirshleifer & Titman, 1990).

El problema del “free-riding” (o “problema del polizón”) es un problema que se da en el ámbito de la economía (y también en otros ámbitos), en virtud del cual, algunos individuos o entes, buscando la maximización individual, tratan de aprovecharse de las ganancias comunes sin aportar en su justa medida. Lo encontramos también en el ámbito de las ofertas de adquisición, cuando cada accionista trata de maximizar su interés económico sin aportar ningún esfuerzo o colaboración para defender o maximizar el bien común.

A causa del “free-riding”, una oferta de adquisición puede fracasar en una empresa cotizada con accionariado difuso a pesar de ofrecer un buen precio (Grossman & Hart, 1988). Según el modelo de Grossman y Hart (1980), en una oferta de adquisición el pequeño accionista no venderá las acciones con el fin de participar así con el adquirente en los beneficios del cambio del control (sin haber tenido que participar en los costes de la operación). Como consecuencia, en caso de propiedad difusa, según este modelo, ningún accionista acudiría a la oferta y la toma de control no se produciría. Por lo tanto, cuando el accionariado de la empresa objetivo es muy difuso la rentabilidad esperada de la operación es nula. Este modelo no tiene en cuenta

22 La cotización de la empresa tiene sentido en el caso de empresas en crecimiento, mientras que en empresas de bajo crecimiento es preferible la exclusión de la cotización o el LBO, debido a que en las empresas cotizadas con propiedad difusa la dirección es reacia a repartir el cash-flow libre (Jensen M. C., 1989) Por otra parte, la cotización en Bolsa tiene la ventaja de facilitar la diversificación y permite la dirección especializada que supone la difusión de la propiedad accionarial (Fama & Jensen, 1983a, 1983b). Sin embargo, otros autores observan en estudios empíricos del mercado financiero británico que las empresas excluidas de cotización no se caracterizan por baja inversión en I+D ni tienen elevados cash.flows libres (Weir et al., 2008).

23 Un LBO “consiste en financiar una parte importante del precio de adquisición de una empresa mediante el uso de deuda”. Estas operaciones suponen un incremento severo en el nivel de apalancamiento de la empresa objetivo (Díez de Castro L. y Mascareñas Pérez-Iñigo, 1991) Distintos autores tratan estos tipos de operaciones (Simons & Renneboog, 2011)

24 La salida de la bolsa española está relacionada con el dinamismo que pueda ofrecer el mercado de capital riesgo español. En el libro de Recondo (2022) podemos identificar los principales actores que conforman el mercado de capital riesgo en España así como los principales elementos del marco regulatorio (Recondo Porrúa, 2022)

la existencia de beneficios de control y asume que la totalidad de los beneficios proceden de la rentabilidad de las acciones, la cual, se distribuye por igual entre todos los accionistas.

Grossman y Hart (1980) proponen que para motivar al accionista y para que así la toma de control tenga éxito, los accionistas deben percibir que recibirán un precio inferior en el caso de no acudir a la oferta exitosa. En la misma línea, Bradley (1980) demuestra empíricamente que después de la ejecución de la oferta el valor de la acción se reduce y propone el siguiente modelo (Bradley, 1980):

$$P_A = F * T + (1-F) * P_E$$

Donde P_A es el precio posterior al anuncio de la oferta de adquisición, F es la proporción de acciones que aceptan la oferta, T es el precio ofrecido en la OPA y P_E es el precio posterior de la acción.

Según Bradley (1980), debido al problema del “free-riding”, el precio ofrecido en la OPA (T) debe ser mayor que el precio posterior (P_E). De lo contrario, los accionistas no acudirán a la oferta. El P_E inferior refleja la dilución que experimentarán los accionistas que no acudan a la oferta por parte del adquirente. Según Grossman y Hart (1980), en la práctica la opresión al accionista se lleva a cabo mediante un menor precio ofrecido en una posterior fusión con la empresa adquirente.

El modelo de Grossman y Hart (1980) no tiene en cuenta la existencia de los beneficios privados de control. Aunque existen otras vías como el disfrute de los grandes beneficios de control privados²⁵. Según Bradley (1980), el hecho de que la empresa adquirente ofrezca un precio superior al precio posterior a la oferta ($T > P_E$) no supone que la empresa adquirente experimente pérdidas, puesto que además de la rentabilidad que se obtendrá por la participación alcanzada en la empresa objetivo,

la empresa adquirente también gozará de los beneficios privados de control, beneficios de los que no disfrutarán los accionistas que no acudan a la oferta. Según Bradley (1980), estos beneficios privados de control pueden consistir en sinergias con la empresa adquirente.

Debido a la importancia del “free-riding” y a la necesidad de opresión de los pequeños accionistas, las ofertas de adquisición de dos tramos (“two-tier”) parecen ser un medio más eficaz que las ofertas a la totalidad para llevar a cabo las tomas de control exitosas. Las ofertas de dos tramos suelen consistir en ofrecer un precio superior en el primer tramo, advirtiendo la intención de ofrecer un precio inferior en el segundo tramo, que normalmente consiste en una fusión mediante canje de acciones.

Estas ofertas de dos tramos permiten apalancar la prima ofrecida (“front-loading”)²⁶. Es decir, a través del “front loading” se ofrece una prima más elevada para los accionistas que acuden al primer tramo de la oferta, mientras que se ofrece un precio más bajo a los accionistas que acuden al segundo tramo, creando así, las condiciones necesarias para que el accionista sea compelido a acudir a la oferta de adquisición (Comment & Jarrell, 1987)

7. El dilema del prisionero

El dilema del prisionero es un problema de la Teoría de los Juegos que muestra que dos personas pueden no cooperar incluso si ello va en contra del interés de ambas. Por lo tanto, un comportamiento individual maximizador puede implicar una pérdida conjunta del colectivo. En el caso de las ofertas de adquisición, un accionariado difuso no coordinado podría verse obligado a vender a un precio desfavorable en el primer tramo de una oferta por temor de obtener un precio aún menor en el segundo tramo.

25 Los beneficios privados de control son de dos tipos: Pecuniarios (sobresueldos, grandes gastos en proyectos del gran accionista, etc) y no pecuniarios: sinergias para grandes accionistas corporativos o prestigio para grandes accionistas individuales.(Barclay & Holderness, 1989)

26 La hipótesis del “front loading” defiende que se ofrece un mayor precio en la oferta inicial, que es superior al precio de cotización pre-oferta y al precio pos-oferta (Bradley, 1980; Comment & Jarrell, 1987; Grossman & Hart, 1988)

En el ámbito de las ofertas de adquisición, Bradley (1980) postula que el accionista puede verse obligado a aceptar una oferta desfavorable, es decir, el accionista puede acudir a una oferta parcial con un precio ponderado P_A desfavorable y aceptar un precio T por las acciones que pueda vender en el prorrateo con el fin de no recibir un precio post-ejecución inferior P_E . El accionista se enfrenta al “dilema del prisionero” y por lo tanto, el accionista en su comportamiento no cooperativo puede verse forzado a acudir a la oferta para no sufrir la dilución posterior. Se puede dar el caso de tener que aceptar un precio ponderado desfavorable²⁷ inferior al precio de cotización pre-oferta²⁸.

A causa del “dilema del prisionero”, el “front-loading” no garantiza los intereses generales de los accionistas de la empresa objetivo. Las distintas normativas que regulan las OPAs tratan de proteger a los accionistas de la empresa objetivo del “dilema del prisionero”. Según la normativa vigente, las ofertas de adquisición obligatorias no pueden ser parciales y se establece un criterio de “precio equitativo”²⁹.

Como consecuencia, la opresión de los pequeños accionistas para evitar el problema del “free-riding” implica el problema del “dilema del prisionero”. La normativa de OPAs trata de defender los intereses de los intereses minoritarios, aunque, por otra parte, pueden desincentivar las tomas de control y acabar perjudicando a los accionistas.

Distintos autores proponen soluciones al problema del “free-riding” y el “dilema del prisionero”.

Según Bradley (1980), la solución a este problema se encuentra en la existencia de un mercado de adquisiciones competitivo. Grossman y Hart (1980) proponen que esta protección de los intereses minoritarios puede hacerse vía estatutos, mediante el nombramiento de tasadores imparciales o mediante el voto favorable mayoritario de los accionistas minoritarios pudiendo establecer el precio inferior en la forma de un precio desfavorable en caso de fusión post-adquisición o en caso de liquidación.

Los accionistas dispersos tienen incentivos para formar una coalición para negociar con el adquirente (Meeker & Joy, 1980). La presencia de un gran accionista constituye una solución parcial al problema, puesto que puede actuar como agente coordinador para reducir el “free-riding” (Shleifer & Vishny, 1986). Los intereses colectivos de los accionistas pueden estar representados por la dirección en una toma de control negociada (Comment & Jarrell, 1987). La dirección por medio de sus acciones puede incrementar la prima recibida en caso de toma de control incrementando el incentivo para que se presenten ofertas más altas o reduciendo la asimetría de la información (Hirshleifer & Titman, 1990).

8. Las ofertas en dos tramos y las primas ofrecidas

Como hemos comentado el problema del “free-riding” implica la solución del “front-loading” y esta solución puede plantear el problema del “dilema del prisionero” en el que el accionista de la em-

27 Precio del primer tramo por las acciones aceptadas en el prorrateo más el precio pos-oferta por las acciones que son devueltas en el prorrateo.

28 En caso de no acudir a la oferta, el accionista recibiría sólo el precio pos-oferta, inferior al precio ponderado. Por ejemplo, vamos a suponer que una empresa tiene 1000 acciones valoradas en 10 euros. Una empresa adquirente formula una toma de control en dos tramos: en el primer tramo dirigido al 60% pagará un precio $T=11$ euros y en el segundo tramo, dirigido a las acciones que no hayan acudido a la oferta y a las acciones que queden fuera del prorrateo, se pagará un precio $P_E = 5$ euros como precio de canje en una fusión posterior. El precio ponderado P_A será de 8,6 euros:
 $11 \cdot 60/100 + 5 \cdot 40/100 = 8,6$

Si los accionistas se ponen de acuerdo evadirán dicha oferta, mientras que si los accionistas siguen estrategias maximizadoras no cooperativas preferirán acudir a la oferta y recibir 11 euros por las acciones que les correspondan en el prorrateo y 5 euros por las que queden fuera, en lugar de quedar fuera y recibir sólo 5 euros por todas sus acciones.

29 En el ordenamiento jurídico de Estados Unidos, a diferencia de lo que ocurre en Europa, ni siquiera hay una ley federal que obligue a formular una OPA en caso de toma de control. Yarrow (1985) defiende que en Europa existe un equilibrio eficiente entre la protección de los intereses minoritarios y la eficiencia de los procesos de toma de control (Yarrow, 1985). En el caso de Estados Unidos, el dilema del prisionero es el argumento central que subyace tras las leyes estatales americanas anti-toma de control denominadas “de precio justo” y también es el objetivo de la mayoría de los planes de píldoras venenosas, permitidas en Estados Unidos en caso de ser recogidas en los estatutos de las empresas objeto de oferta de adquisición.

presa objetivo se ve obligado a aceptar una oferta desfavorable y en ese caso, es previsible que los rendimientos anormales observados en la empresa objetivo sean inferiores. Para analizar el impacto que tiene el “dilema del prisionero” sobre los rendimientos anormales de la empresa objetivo es importante analizar la evidencia empírica. En este sentido, las ofertas de dos tramos no ofrecen menor precio ponderado³⁰ que las ofertas de adquisición a la totalidad (Comment & Jarrell, 1987). Estos resultados contradicen el modelo de Grossman y Hart (1980), quienes defienden que un mayor nivel de dilución hace que las primas recibidas por la empresa objetivo en caso de toma de control sean inferiores.

No se observa un mayor nivel de coacción en las ofertas de dos tramos, puesto que no acude un mayor número de acciones en la primera fase de las ofertas de dos tramos que en las ofertas a la totalidad (Comment & Jarrell, 1987), como debería suceder en caso de una mayor dilución posterior (Hirshleifer & Titman, 1990; Liebler, 1997).

Esta contradicción parece resuelta por distintas investigaciones. La estructuración de la oferta de adquisición en dos tramos tiene la finalidad de atender la diversa situación fiscal de los accionistas de la empresa objetivo, quienes preferirán canje si desean la exención fiscal y metálico si desean una mayor prima (Brown, 1988). Por lo tanto, las ofertas de dos tramos no se estructuran así para ser sobresuscritas sino para atender diferencialmente a los dos tipos de situaciones fiscales (Hirshleifer & Titman, 1990; Liebler, 1997). Son raras las ofertas de dos niveles sin exención, por lo que, las ofertas de dos niveles se configuran para optimizar la operación en cuanto al tratamiento fiscal y la asimetría de la información (Brown y Ryngaert, 1991).

9. Las ofertas parciales y las primas ofrecidas

Las ofertas que no son a la totalidad suponen una falta de voluntad para adquirir más acciones, lo cual, implica que una vez que la empresa adquirente alcanza la participación deseada no está dispuesta a pagar el mismo precio por el resto de las acciones (Roy, 1985). Algunas veces esta falta de voluntad obedece a restricciones en la financiación de la empresa adquirente.

Con frecuencia, el sobreprecio supone la existencia de beneficios de control privados. La existencia de estos beneficios de control privados permite el “front-loading” y reduce el “free-riding”, puesto que la formulación de una oferta de adquisición parcial sirve como señal que indica que el precio post-oferta será inferior³¹ al que ofrece el adquirente. Por otra parte, el adquirente podrá ofrecer una prima inferior para convencer a un porcentaje suficiente de accionistas para que acuda a su oferta, lo cual, redundará en un nivel inferior de rendimientos anormales alrededor del suceso de la OPA.

En este sentido, algunos estudios empíricos registran que las ofertas parciales ofrecen una menor prima ponderada³² (22,8%) que las ofertas a la totalidad (56,6%) y también menor que las ofertas de dos tramos (55,9%) (Comment & Jarrell, 1987). No obstante, según Comment y Jarrell (1987, 300), el precio posterior a las ofertas parciales es superior al precio anterior a la oferta, por lo que no parece plantearse el “dilema del prisionero”.

Probablemente, estos menores rendimientos anormales obedecen a que el carácter parcial de la oferta señala una preferencia por los beneficios de control privados³³ por parte de la empresa adquirente y una menor importancia de las mejoras

30 Definiendo precio ponderado como el resultante de ponderar el precio que ofrece el adquirente en la oferta por el porcentaje que será adquirido y el precio esperado de la acción después de la oferta por el porcentaje de las acciones que quedan sin adquirir.

31 Debido a la existencia de beneficios de control privados.

32 Se refiere a la ponderación del precio ofrecido por la fracción de acciones adquiridas más el precio posterior a la oferta por la fracción de acciones sin adquirir.

33 Aunque la hipótesis central es la existencia de beneficios privados de control, puede haber hipótesis alternativas que expliquen los menores rendimientos anormales observados en las ofertas parciales. En este sentido, otros autores defienden que las ofertas de adquisición a la totalidad reportan más ganancias a los accionistas que las ofertas de adquisición parciales y lo atribuyen a que después de la toma de control los costes de cotización y los costes de agencia entre los accionistas de control y los accionistas minoritarios permanecen en las ofertas de adquisición parciales, mientras que estos costes desaparecen en el caso de las ofertas a la totalidad (Amoako-Adu & Smith, 1993).

de cash-flow posteriores a la toma de control, puesto que desea adquirir un porcentaje limitado de acciones. En este sentido, Comment y Jarrell (1987) observan que las ofertas parciales se caracterizan por menores ganancias “back-end”, es decir, con posterioridad a la oferta las acciones valen un 14,5% más que antes de la oferta (frente al 45,3% en las ofertas de dos tramos y al 54% en las ofertas a la totalidad), siendo la prima ofrecida un 22,3% mayor al precio posterior a la oferta en caso de oferta parcial (frente a un 2,4% en el caso de las ofertas a la totalidad y a un 13,8% en las de dos tramos).

10. Las cláusulas drag-along y tag-along

Las cláusulas estatutarias pueden influir el resultado y el reparto de las plusvalías en una eventual adquisición de la empresa. Estas cláusulas pueden proteger los intereses de los accionistas minoritarios en aquellas sociedades no cotizadas donde no se aplique la regulación sobre Ofertas Públicas de Adquisición y también pueden complementar la legislación sobre OPAs en aquellas sociedades donde la legislación sea aplicable, como las sociedades que cotizan en mercados regulados o en sistemas multilaterales de negociación.

Algunas cláusulas estatutarias tratan de proteger los derechos de los accionistas minoritarios ante una eventual toma de control. Las cláusulas principales más extendidas en las empresas de nueva creación son las siguientes:

1) Preferencia en caso de liquidación. Con frecuencia, establecen una prioridad en la recuperación de su inversión en el caso de liquidación. En ocasiones se establece que se recuperará la inversión realizada por un factor de 2 o 3. Aunque este multiplicador nos

parezca un exorbitado, el inversor que invierte su dinero en una empresa de reciente creación sabe que se embarca en un proyecto de alto riesgo y tiene la expectativa de multiplicar por 2 o por 3 su dinero para compensar lo que pierde en otros proyectos de riesgo similar. Podemos considerar estas cláusulas como una manera de establecer un precio equitativo en caso de no cotizar en el mercado financiero. La regulación sobre OPAs también trata de establecer un precio equitativo para defender los intereses de todos los accionistas.

2) Drag-along Rights: Obliga a los restantes accionistas a vender en caso de una toma de control. Esta cláusula es similar al “squeeze-out” que contempla la normativa española actual para las empresas cotizadas³⁴. Estas cláusulas incrementan la probabilidad de adquisición, sobre todo, en los casos en los que el adquirente necesita obtener un porcentaje mínimo para que la adquisición tenga lugar y también en el caso de que la empresa adquirente desee llevar a cabo una fusión. Con el fin de evitar el “dilema del prisionero”, es necesario establecer un criterio de precio equitativo, el cual, puede estar relacionado con el precio pagado en la oferta de adquisición, o bien, puede estar relacionado con la cláusula anterior relativa a la preferencia en caso de liquidación.

3) Tag-along Rights: Obliga al adquirente a comprar la totalidad en caso de una toma de control. Esta cláusula es similar al “sell-out” que contempla la normativa española actual para las empresas cotizadas. En el caso de las empresas cotizadas el Real Decreto 1066/2007, de 27 de julio, sobre el régimen de las ofertas públicas de adquisición de valores obliga al adquirente a extender la oferta de compra al resto de los accionistas y no dirigirla exclusivamente a los accionistas de control.

34 Cuando se produzca un éxito de más del 90% en una OPA, el resto del accionariado podrá exigir al adquirente la compra de sus acciones (“sell-out”) y también el adquirente podrá exigir a los accionistas restantes la venta de sus acciones (“squeeze-out”). Así lo establece la Ley 6/2007 de Reforma de la Ley 24/1998 del Mercado de Valores de fecha 12 de abril, que traspone a nuestro ordenamiento jurídico las disposiciones de la Directiva 2004/25/CE, de 21 de Abril de 2004 (Ainara Rentería Tazo, 2007; Hoedl, 2007; Kolb, 2014)

Esta normativa que protege a los accionistas minoritarios se aplica a las empresas cotizadas en Bolsa. Las cláusulas “Tag-along” obligan al comprador de una oferta de compra parcial a extender la oferta a los accionistas entrantes y sirve para la protección de las sociedades no cotizadas (no protegidas por la regulación de OPAs) y también para complementar la regulación sobre OPAs, en el caso de tratarse de una sociedad cotizada.

11. Conclusiones

Distintos autores analizan la dinámica que se establece en las OPAs desde el punto de vista de los distintos actores que participan: accionistas de la empresa objetivo, dirección de la empresa objetivo, accionistas de la empresa adquirente, dirección de la empresa adquirente, etc.

La regulación de las Ofertas Públicas de Adquisición trata de proteger los intereses de todos los accionistas de la empresa objeto de OPA y trata de que los accionistas minoritarios no se encuentren desprotegidos. Algunos autores documentan la necesidad de contar con un sistema más flexible de formulación de OPAs con el fin de aumentar la probabilidad de éxito de estas operaciones que tantas plusvalías pueden reportar a los accionistas de las empresas objetivo.

Las empresas no cotizadas tienen la opción de establecer un sistema de salvaguardas para los accionistas minoritarios en la forma de cláusulas estatutarias que protejan al accionista minoritario en caso de que la empresa experimente un proceso de toma de control mediante fusión y/o adquisición.

Al igual que la normativa sobre OPAs, las cláusulas estatutarias que protegen a los pequeños accionistas pueden incrementar el precio que estos reciben, pero también pueden reducir la probabilidad de que tengan lugar las operaciones de adquisición.

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Mercados de capitales españoles: analizamos, desde 2003, las operaciones realizadas en el mercado regulado y en los SMN españoles, **con componente de capital riesgo**.

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- Número y análisis de las operaciones realizadas (inversión y desinversión)
- Localización geográfica de gestores e inversiones



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Private Debt as a Strategic Asset: Performance, Structural Integration, and Portfolio Efficiency in Private Capital Markets

(La Deuda Privada como Activo Estratégico: Desempeño, Integración Estructural y Contribución a la Eficiencia de Carteras)

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Sumario

Executive summary.

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2. Background.
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Abstract

This paper explores private debt (PD) as a growingly significant asset class in private capital markets. It evaluates PD across three dimensions: performance, structural integration into private equity and fund operations, and contribution to portfolio efficiency using Modern Portfolio Theory. Drawing on empirical return data, market studies, and expert interviews, the study demonstrates that PD delivers competitive, risk-adjusted returns, exhibits lower volatility than other private assets, and enhances portfolio optimization outcomes. Furthermore, PD plays a vital structuring role in leveraged transactions and fund strategies. These findings suggest that PD is a core, not peripheral, component of modern institutional investment design.

Keywords: Private Debt, Portfolio Optimization, Private Equity, Alternative Investments, Risk-Adjusted Return.

Resumen

Este trabajo analiza la deuda privada (DP) como una clase de activo estratégicamente relevante en los mercados de capital privado. Evalúa la DP desde tres dimensiones: su rendimiento, su integración estructural en operaciones y fondos de capital privado, y su impacto en la eficiencia de carteras mediante la Teoría Moderna de Carteras. A partir

de datos empíricos, estudios de mercado y entrevistas a expertos, se demuestra que la DP ofrece rendimientos competitivos ajustados al riesgo, menor volatilidad que otros activos privados y mejora la optimización de carteras. Se concluye que la DP debe considerarse una pieza central en la inversión institucional moderna.

Palabras clave: Deuda Privada, Optimización de Cartera, Capital Privado, Inversiones Alternativas, Rentabilidad Ajustada al Riesgo.

JEL Classification Codes: **G11:** Portfolio Choice; Investment Decisions. **G23:** Non-bank Financial Institutions; Financial Instruments. **G24:** Investment Banking and Venture Capital. **G32:** Financing Policy; Financial Risk and Risk Management.

Executive summary

This thesis presents a data-driven and practically grounded analysis of private debt (PD) as a structurally significant asset class that is playing an increasingly central role in investment portfolios. It evaluates PD through three core lenses: its standalone performance dynamics, its strategic integration into private capital fund structures, and its portfolio-level effects within diversified asset allocations. Through a combination of empirical modeling, qualitative insights, and market data synthesis, this paper provides a deep understanding of PD's changing influence on global capital allocation.

The first section examines the overall private debt market, and its returns and volatility profiles, particularly in relation to private equity (PE) and venture capital (VC). Using compiled IRR data and return dispersion models, the study finds that PD exhibits one of the narrowest interquartile ranges among private asset classes, with consistently lower downside volatility; nevertheless, PD maintains competitive returns, positioning it as a stabilizing, but high-yield strategy. For borrowers,

PD offers flexible capital often unavailable through banks, despite strong creditworthiness, enabling growth, innovation, and strategic moves. Moreover, at -0.18, PD also showed the lowest correlation to changes in interest rates (with a two-quarter lag), beating PE (-0.49) and VC (-0.56), indicating its macro-resilience in tightening conditions, more insulated from central bank cycles.

The next section examines the integration of private debt within alternative investment funds, highlighting its rising use by private equity firms not just as financing but as a strategic structuring tool. Insights from expert interviews, particularly in the Spanish market, emphasize PD's flexibility, regulatory challenges, and growing relevance. These findings reinforce PD's role as a core, not peripheral, component of modern investment strategies.

The third section modeled private debt's impact on portfolio performance using Modern Portfolio Theory (MPT), including the Global Minimum Variance Portfolio (GMVP), Sharpe Ratios, and an unconstrained envelope portfolio based on Merton's frameworks (1972; 1974). Simulations were conducted using Bloomberg return data (2015–2025) from 5 funds serving as proxies for VC, PE and PD strategies. The results show that portfolios incorporating PD consistently outperformed both equity-only and traditional blends on a risk-adjusted basis, improving overall efficiency across optimization models. In the GMVP, PD vehicles (MAIN and ARCC) received nearly 79% of total allocation, driving volatility down to 23.67%, below that of any individual fund. The constrained Maximum Sharpe Ratio portfolio, while slightly rebalancing toward PE, still assigned over 47% to PD, with a Sharpe Ratio of 0.556, compared to just 0.487 for the best-performing standalone fund. In the unconstrained portfolio, which allows theoretical leverage and shorting, PD remained dominant, producing the highest Sharpe Ratio (0.592) while maintaining long exposure to MAIN and ARCC.

The evidence across all three sections converges to achieve one central conclusion: private debt is not

merely opportunistic or situational, it is structurally positioned to contribute both standalone and synergistic value. The asset class exhibits performance characteristics that outperform on a risk-adjusted basis, integrates strategically into deal structuring, and meaningfully improves portfolio efficiency under both constrained and theoretical frameworks. Therefore, these findings suggest that PD should no longer be considered as a secondary opportunity, but as a core component of modern institutional portfolio strategy.

1. Introduction

Over the past two decades, Private Debt (PD) has quickly become one of the most active and fast-growing asset classes available on the global capital markets following the GFC. Rising in response to capital restrictions and tighter rules faced by conventional banks, PD currently serves a crucial function in corporate financing, especially for mid-market companies and leveraged borrowers who pre-crisis may have historically depended on bank lending. Private debt offers tailored and usually more flexible financing structures than publicly traded loan instruments; it is made of direct, bilateral agreements between non-bank lenders and borrowers. Driving this industry forward are institutional investors including asset managers, pension funds, and private credit companies, making PD today a pillar of the larger alternative investment scene (Allianz Research, 2024).

A key turning point for this change was the Global Financial Crisis (GFC) of 2008. Following it, laws such as Basel III, the Dodd-Frank Act, and tougher capital reserve requirements set by central banks, especially the ECB, markedly limited banks' capacity to guarantee high-risk loans. Particularly for leveraged buyouts (LBOs), growth-stage companies, and corporate restructurings, this dislocation produced a financial shortage. Quickly filling this gap, private debt funds (PDFs) used their freedom from regulatory capital restrictions to provide custom-made credit solutions, although at higher interest rates. The credit scene has therefore

changed significantly as private lenders now offer a growing portion of finance usually managed by banks (Erel & Inozemtsev, 2024; PitchBook, 2024).

Despite its growing importance, private debt remains underexplored in both academic literature and practitioner-led research, especially when compared to other private capital strategies such as private equity (PE) and venture capital (VC). As institutional capital continues to pour into this space, it is crucial to assess not only PD's standalone performance characteristics, but also its strategic integration into broader investment frameworks. Therefore, key questions remain unanswered, and will be evaluated throughout this paper:

1. Does private debt consistently provide enhanced risk-adjusted returns compared to other Private Capital strategies?
2. How does its use by private equity funds, both through internal financing and supply of PD strategies themselves, impact fund-level performance and capital efficiency?
3. What is the role of PD in portfolio construction, specifically in terms of enhancing Sharpe ratios and reducing overall volatility?

This thesis seeks to evaluate the overall growth of this rising PD market and more specifically assess these questions by providing a comprehensive and empirically grounded analysis of private debt's evolution, performance, and strategic relevance in alternative investments. It looks at the fundamental drivers of asset class expansion as well as its integration into private equity deal-making and effect on diversified portfolio efficiency. By means of both theoretical and empirical approaches, this thesis performs a multi-layered study of the relative performance of private debt, its structural use in Private Equity environments and Alternative Investment funds, and its contribution to diversified portfolio construction.

To meet these objectives the study employs a mixed-methods research design combining qual-

itative and quantitative aspects. The performance consistency of private debt relative to other private capital strategies is assessed using internal rate of return (IRR) comparisons, volatility evaluations, and dispersion analysis, therefore directly addressing risk-adjusted return dynamics. Incorporating real-world market sensitivity, building correlation matrices to investigate their interaction with private debt and other assets, a macroeconomic overlay evaluates the resilience of private debt under many interest rate environments. Additionally, Modern Portfolio Theory (Markowitz, 1952) was employed to construct and evaluate empirical portfolios that include private debt, private equity, and venture capital. The study looks at whether adding PD increases portfolio efficiency by computing measurements including Sharpe ratios, efficient frontiers, and portfolio volatility through examining the data from five real funds extracted from Bloomberg. To evaluate how private debt is used in actual financing structures and fund strategies, the qualitative component consists of organized expert interviews to obtain a “real world” perspective of the overall market.

The study also assesses private debt’s endurance and resilience throughout several economic cycles. While keeping remarkably low default rates, roughly 0.5% in the United States, considerably below syndicated loan standards, PD funds achieved net returns of 11.1% in 2023, surpassing both high-yield bonds and buyout funds (PitchBook, 2024; Private Debt Investor, 2024). First-lien seniority and floating interest rates have made PD an increasingly appealing option for conventional fixed-income instruments.

By investigating private debt’s several functions as both a stand-alone strategy and a portfolio supplement to equity-based investments, this thesis hopes to close a major void in academic and practical financial literature. Understanding its performance dynamics, structural integration, and portfolio implications is of increasing relevance for investors and legislators, as the asset class continues to draw more capital and redefine conventional lending arrangements.

2. Background

To understand the rising role of private debt (PD) in modern capital markets and its integration into private capital portfolios, it is necessary to first provide a thorough analysis of its evolution, structure, and relevance. From a minor alternative investment strategy fifteen years ago, PD has evolved into a fundamental institutional asset class addressing the financing gap left by growingly risk-averse banks. Combining investor demand for yield and diversification, with the post-2008 regulatory environment, produced ideal conditions for the spread of non-bank lending models, and private debt became a main source of funding for mid-market, leveraged, and non-investment-grade corporate borrowers.

a. Post-GFC Regulation and the Expansion of Private Credit

The 2008 Global Financial Crisis (GFC) ignited a significant reorganization of global credit markets, opening the door from traditional bank lending into other financial intermediation. Following this shock, international regulatory bodies implemented sweeping reforms to strengthen bank solvency and mitigate systemic risk, in an attempt to prevent repetition of a crisis of that magnitude. Most notably, the Basel III framework introduced in 2010, increased minimum capital requirements, introduced liquidity metrics, and imposed leverage restrictions on banks. Specifically, Basel III raised the minimum Common Equity Tier 1 (CET1) capital ratio from 2% to 4.5%, introduced a capital conservation buffer of 2.5%, and mandated the Liquidity Coverage Ratio (LCR) and Net Stable Funding Ratio (NSFR) to manage short and long-term funding risks, respectively (Basel Committee on Banking Supervision, 2017). All of these limited the bank’s actions and made some types of lending more expensive.

Following this, Basel IV introduced an “output floor,” meaning that even if banks used an internal risk model, which gave low risks and did not require banks to withhold much capital in reserves, the banks would need to hold at least 72.5% of the

capital which would be required if they used the “standardized approach” – a regulatory method that assigns fixed risk weights to assets regardless of internal assessments. For banks, this essentially made lending to unrated or below investment-grade corporate borrowers much more capital-intensive, and thus, they were more unlikely to do so at an affordable price (see Chen et al. (2017)).

In the United States, the Dodd-Frank Act of 2010 imposed additional restrictions, the Volcker Rule (12 CFR § 248) prohibited proprietary trading and limited bank ownership of alternative investment vehicles to 3%. These changes sharply limited bank activity in high-yield corporate lending and leveraged buyouts (Acharya, Schnabl, & Suarez, 2014). In Europe, the Basel standards were implemented through the Capital Requirements Directive IV (CRD IV) (Directive 2013/36/EU) and Capital Requirements Regulation (CRR) (Regulation (EU) No 575/2013). Spain aligned with these measures through Law 10/2014, which imposed higher capital adequacy standards and more conservative risk-weighting of credit exposures, particularly affecting mid-market and unrated borrowers (Banco de España, 2019).

On the other hand, in Spain, private debt funds are typically structured as Alternative Investment Funds (AIFs) and regulated by the Comisión Nacional del Mercado de Valores (CNMV) under the

broader framework of the EU Alternative Investment Fund Managers Directive (AIFMD). While they are not subject to the same capital adequacy or standardized underwriting rules as banks, they are overseen through requirements focused on investor protection, transparency, risk disclosure, and leverage limits. The CNMV’s role centers on ensuring regulatory compliance and reporting standards, rather than restricting deal structuring or credit allocation methods (ESMA, 2020), and while there is still monitoring and regulation, many of the limits established on traditional banks are not applied here.

This regulatory difference sometimes created a competitive advantage for private lenders, enabling them to offer tailored financing solutions, including flexible repayment terms, and floating-rate structures. As a result, non-bank credit providers became the preferred source of funding for many mid-market borrowers, particularly those excluded from traditional bank lending due to regulatory constraints and high bank standards. As seen in *Figure 1*, by 2023 Private Debt captured 15.4% of the total fundraising, thus becoming the second most invested instrument in the Private market after Private Equity investments. Since 2009, the investment in Private Debt has grown 859%, reaching a peak in Fundraising in 2021.

(Figure 1)

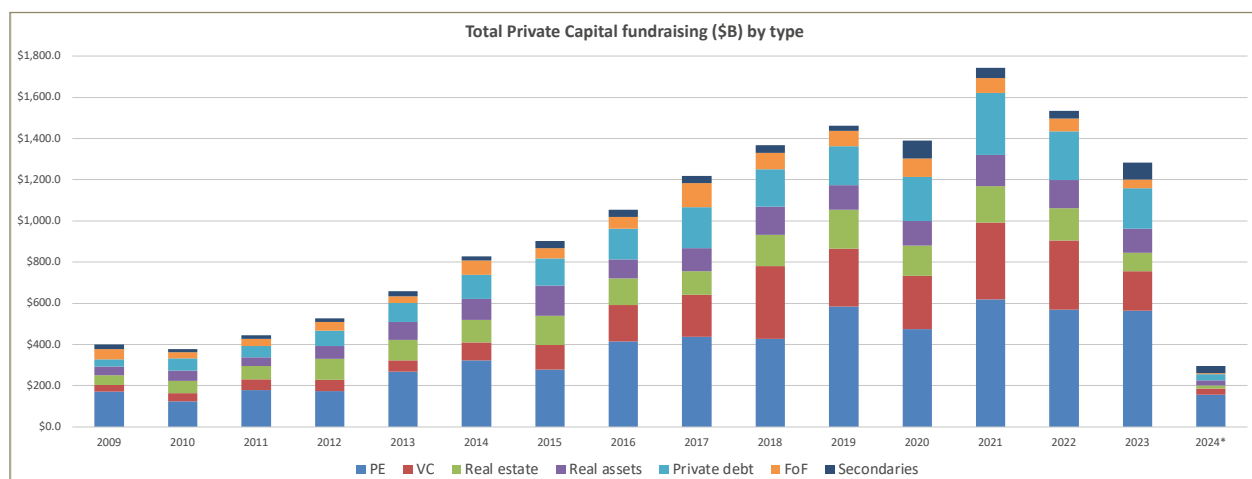


Figure 1: Evolution of Total yearly Private capital Fundraising (US B\$). Data compiled from Preqin, Pitchbook Q1 2024 Global Private Market Fundraising Report and Cambridge Associates. *As of March 2024

Global PD accumulated Assets under Management (AUM) have grown from approximately \$300 billion in 2010 to over \$1.7 trillion in 2023, with BlackRock (2024) projecting growth beyond \$3.5 trillion by 2028. This huge surge reflects sustained institutional demand, particularly among pensions, insurance companies, and wealth funds seeking yield premiums, steady income, and lower volatility than equities. In a persistently low interest rate environment throughout the 2010s, PD became a favored alternative to traditional fixed income. However, as of early 2024, dry powder in the private credit space exceeded \$500 billion, which signaled strong investor appetite, but also growing concerns around deployment bottlenecks and increasing competition for deals (Allianz Research, 2024; Cambridge Associates, 2023).

Private debt isn't a uniform asset class, but rather it includes a diverse mix of strategies tailored to different risk-return preferences and borrower profiles, each serving distinct corporate financing needs. Due to the illiquid nature of most private credit instruments, and the lack of a big secondary market, lenders generally hold them to maturity or until refinancing. To compensate for this illiquidity and risk, contracts often include enhanced terms such as equity kickers, prepayment penalties, and lender oversight rights (Board of Governors of the Federal Reserve System, 2024). An overview of the main types of debt structures used must be done to understand the intricacies and benefits of each:

- **Direct Lending:** The largest category of Private Debt, with more than 54.9% of all PD fundraising value as can be seen in *Figure 2*. At its core, it involves non-bank lenders, mainly private credit funds, providing loans directly to companies, either through one-on-one arrangements or small club-style deals. These loans are usually senior secured (first-lien or unitranche), privately negotiated, and tailored to the borrower's needs, whether for growth, acquisitions, recapitalizations, or buyouts. This asset has grown especially popular in PE related transactions,

where these funds prioritize speed, certainty, and flexibility in capital deployment, especially if closing a deal is dependent on funding. These loans normally have floating-rate structures, light terms for borrowers, and short-to-medium maturities, often offering credit spreads of 500–700 basis points over benchmark rates (Morgan Stanley, 2024).

- **Mezzanine loan:** Mezzanine financing occupies a subordinated position between senior debt and equity, typically used to fill funding gaps that senior lenders will not cover but that equity sponsors wish to avoid diluting with additional equity issuance. To make up for the added risk, they typically offer higher interest rates, sometimes paid in kind, and often include equity-like perks, like warrants or the option to convert into shares later on (Buchner, Lopez-de-Silanes, & Schwienbacher, 2023), while still providing more downside protection than pure equity.
- **Distressed debt & special situations:** These include lending to or acquiring the debt of businesses dealing with operational difficulties, liquidity crises, or extreme financial hardship. These funds demand sophisticated legal, restructuring, and valuation knowledge since their targets are opportunistic profits from either debt claims restructuring or asset liquidation or turnaround tactics. Although it is intrinsically riskier and more volatile than other PD approaches, it has the possibility for equity-like returns, particularly in cases of undervaluation or restructuring that results in significant borrower credit quality improvement (Erel & Inozemtsev, 2024).
- **Asset-Based Lending (ABL):** ABL strategies rely on tangible collateral, such as receivables, inventory, machinery, or real estate, as the primary source of loan repayment. These loans are structured around the liquidation value of the assets, with loan-to-value (LTV) ratios ranging from 50–80%, depending on the asset class. ABL is frequently used by borrowers that are asset-rich but

cash-flow poor, particularly in sectors like manufacturing, logistics, and retail. From an investor's perspective, ABL provides a more secure credit profile, but often at lower yields compared to mezzanine or special situations strategies (Bank of America, 2024).

- **Venture Debt:** A high-risk, high-reward segment tailored for early-stage startups that have limited or no operating income, and are generally backed by VC sponsors. These loans often carry minimal collateral, rely on forward-looking business projections, and include substantial equity kickers, so the expected return is reliant on the capital gains linked to a future sale on top of interest income generated. Although this is still a small portion of the total private debt market by AUM, venture debt plays an increasingly strategic role in startup financing, which they may not get through other structures, without immediate equity dilution (PitchBook, 2024).

(Figure 2)

As seen in *Figure 2*, the composition of dominant instruments in the PD market has varied, throughout which direct lending emerged as the leading instrument in around 2013 and has remained so since.

b. Global trends and performance

Although private debt is now a globally acknowledged asset class, its distribution and presence

is still quite concentrated; the United States and Europe account for the great bulk of market activity and fundraising. As of 2023, the U.S. alone comprised roughly \$1.1–1.2 trillion of global private debt assets under management (AUM), representing approximately two-thirds of the global total (Cambridge Associates, 2024). Europe followed with \$400–500 billion, while Asia-Pacific, Latin America, and other emerging markets collectively contributed less than 10%.

Fundraising trends in private debt have generally moved in line with the broader macroeconomic landscape, and between 2010 and 2021 PD saw uninterrupted growth fueled by low interest rates, strong investor demand, and low default rate (PitchBook, 2024). In 2022, over 68% of all private debt fundraising was committed to North America-focused funds, compared to approximately 29% for Europe and just 3% for Asia and the rest of the world as represented in *Figure 3*. This gap reflects the U.S.'s long-standing comfort with private capital markets, larger institutional capital pools, and well-established legal systems for creditor rights and enforcement (M&G, 2024). Europe has seen increased adoption in recent years, driven by regulatory harmonization under the AIFMD and the emergence of cross-border private credit managers. However, market fragmentation, divergent legal regimes, and the absence of a unified bankruptcy framework continue to limit the scalability of deals compared to the U.S. model.

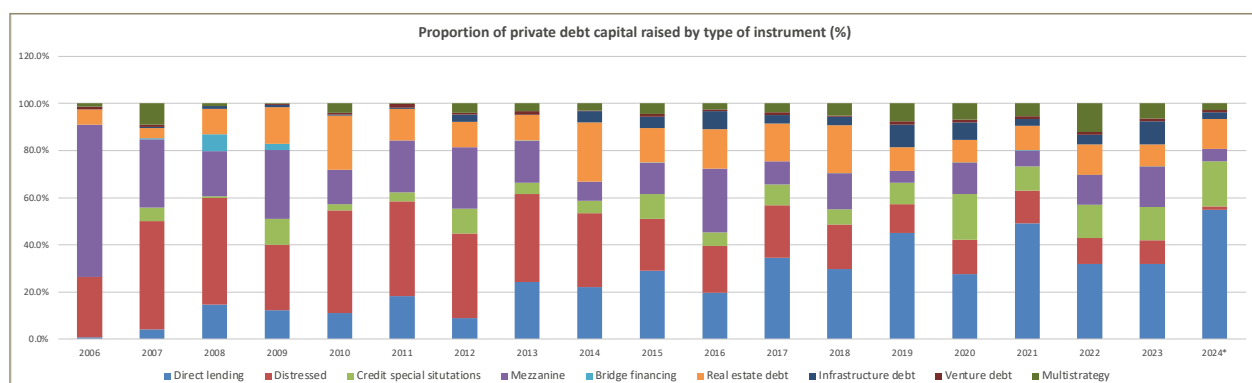


Figure 2: Private Debt capital raised by type of Instrument (2006-2024). *As of July 2024. Data Source: Pitchbook Global Private Debt report H1 2024

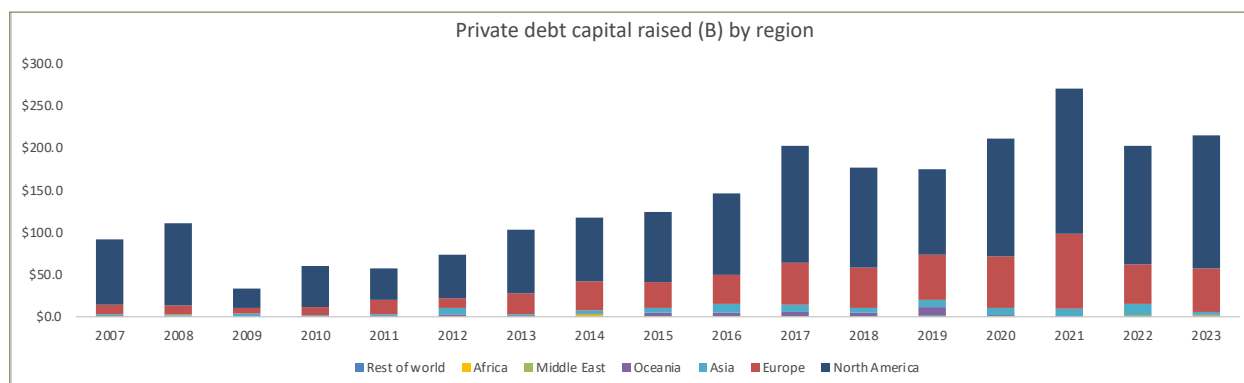


Figure 3: Private Debt capital Fundraising by region. Data Source: PitchBook H1 2024 Global Private Debt Report

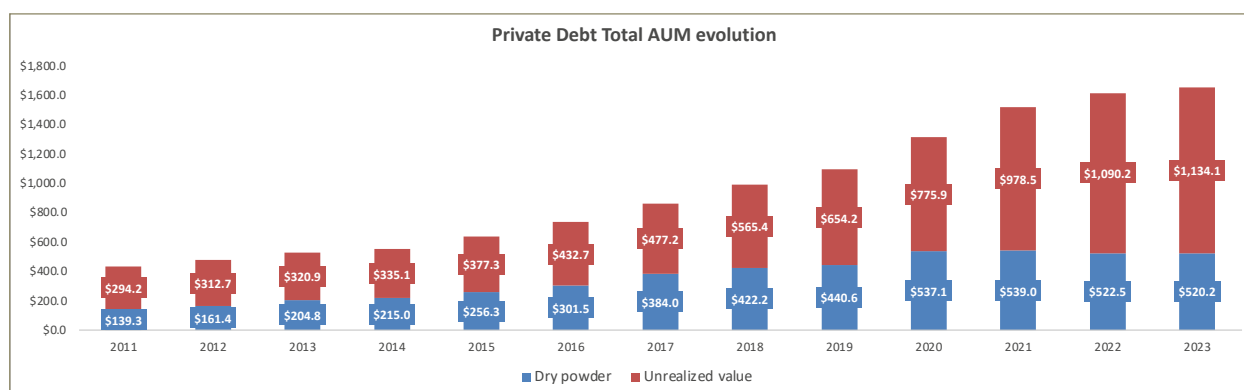


Figure 4: Evolution of Total AUM in Private Debt (US B\$). Data Source: Preqin. Historical (actual) data as of Aug. 2024

(Figure 3)

However, the rising rate environment and macro uncertainty of 2022–2023 caused a slowdown in new fundraising, even as AUM continued to grow due to accumulated capital. As of early 2024, “dry powder” in private debt has reached over \$500 billion, nearly one-third of total AUM (BlackRock, 2024) as seen in Figure 4. This signals both the sustained investor interest, and the expanding pressure on managers to deploy capital effectively amid heightened competition and fewer attractive credit opportunities. Industry analysts warn that excessive liquidity could erode underwriting discipline and lender protections, especially in the mid-market and sponsor-backed segments (Allianz Research, 2024).

(Figure 4)

As mentioned, it is not surprising that the US holds the highest proportion of PD fundraising

consistently every year, although its total dominance has slightly shifted, from holding 88% of total funds raised in 2008 to 69% in 2022. However, the US is still undeniably the leading market for Private Debt as expressed in Figure 4, followed by a growing European Market, and together the US and Eurpe hold 97.6% of the total Private Debt funds raised.

On top of absolute values, represented in Figure 3, Figure 5 provides a more nuanced perspective by evaluating private debt fundraising as a proportion of each region’s GDP. This approach enables a fairer comparison across economies of different sizes and highlights the actual integration of private credit markets in the broader financial ecosystem. This not only shows that the Private debt is growing at a higher pace than the economy, but also shows that the US market, even proportionally to GDP, is much bigger than the European market.

(Figure 5)

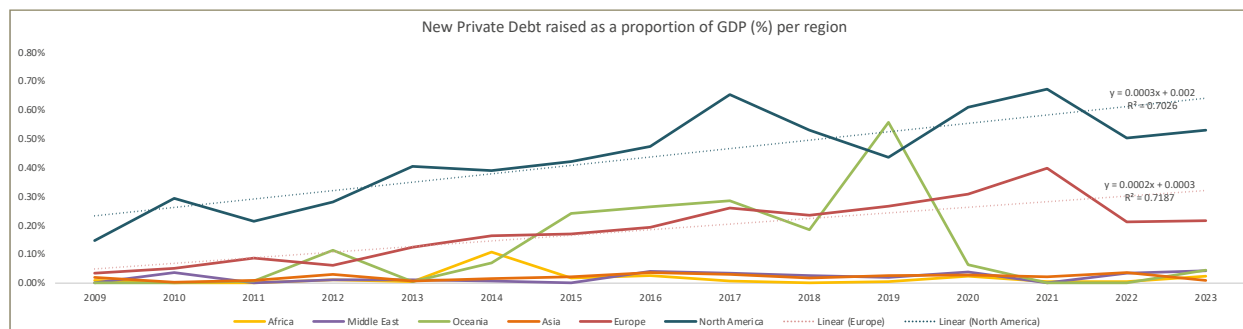


Figure 5: Analysis of the evolution of Private Debt fundraising per region as a proportion of the GDP in that region. Data Sources: PitchBook 2024 H1 Global Private Debt and the World Bank (2024), global GDP (Current US\$)

The data show that, by 2023, North America's private debt fundraising reached 0.53% of its GDP, while Europe lagged at just 0.22%. This disproves the notion that the size disparity between North American and European private credit markets is purely a function of economic scale. Instead, the figures illustrate that private debt in North America is more deeply embedded in the economy, reflecting a more mature and institutionally integrated market structure. Moreover, the upward-sloping trend lines in both regions indicate that private debt has grown faster than GDP, suggesting not just macroeconomic expansion but a fundamental shift in financing models toward non-bank credit solutions. This structural growth also counters the idea that PD expansion is merely cyclical or driven by temporary dislocations.

c. Literature review

Though its increasing importance, especially in the post-2008 regulatory climate, PD lacks the same depth of scholarly research as private equity (PE), venture capital (VC), or even public fixed income. Actually, most of the fundamental research on PD concentrates on stressing its origin as a reaction to banking disintermediation during the GFC and analyzes the regulatory constraints and their implications. Arguing that PD funds formed to close the consequent gap, Erel and Inozemtsev (2024) record the withdrawal of traditional banks from mid-market business lending due to capital restrictions imposed by Basel III and IV. Working outside the controlled banking system and mostly serving leveraged buyouts (LBOs), their work

alongside Chen, Hanson, and Stein (2017) identifies PD as a structurally different lending channel.

Recently, a growing number of empirical studies have examined PD's performance and return characteristics. Most notably, Erel, Flannery, and Weisbach (2024) apply advanced risk-adjustment methodologies to evaluate private debt fund returns, and test the claims of superior returns. Once both debt and equity risks are taken into consideration, their study shows that PD structures should not be evaluated strictly accounting for public debt risks as they sometimes have been; rather, PD funds generate no significant net alpha for investors, implying that any return premium mostly goes to fund managers as fees. More hopeful assessments of private debt, on the other hand, point to better performance than what the Erel (2024) academic results suggest. Cliffwater (2024), for example, applies a Sharpe-based style regression to the Cliffwater Direct Lending Index (CDLI) and finds that private debt delivered approximately 400 basis points of net, risk-adjusted excess return over the past two decades. This outperformance is often attributed to senior secured positioning, strong covenant structures, and relatively low equity market exposure. Additionally, Suhonen (2024) provides empirical evidence that private debt returns exhibit significantly lower dispersion across vintages compared to private equity or venture capital, suggesting greater consistency and predictability for institutional portfolios, which is a crucial measure for investors. While broader claims about illiquidity premiums in private markets have been made by sources such as the CAIA Association, their gen-

eral framing points to the idea that PD's returns reflect compensation for structural features, such as limited liquidity opportunities, which must be considered, rather than traditional market risks alone.

From a portfolio construction perspective, the literature is more fragmented. While Modern Portfolio Theory (Markowitz, 1952) has been applied to private capital, few peer-reviewed studies rigorously assess PD's contribution to diversified portfolios. CAIS (2023) provides simulation-based evidence showing that including PD in a traditional 60/40 stock-bond portfolio increases Sharpe ratios and lowers volatility. They estimated that a 10–15% allocation to PD improves risk-adjusted returns due to the asset class's low correlation with equities and with investment-grade bonds. This was particularly true when PD replaced a bigger portion of lower-yielding fixed income rather than public equities, but even when the PD participation replaced an equity investment portion, the portfolio did also marginally outperform by comparison and additionally lowered volatility.

Regarding market dynamics, various industry white papers have examined how macroeconomic events such as inflation or changes in interest rates might impact PD performance. Because of floating-rate structures, Morgan Stanley (2024) research highlights that PD portfolios gain from higher rates through more coupon revenue. However, the same environment has led to borrower stress and slower deal volumes, particularly in Europe (Muzinich & Co., 2023). With over \$1.6 trillion in AUM but \$500 billion in dry powder, Moody's (2024) even warns that the PD market may be approaching saturation with competition for deals lowering rates and covenant strength perhaps weakening the historical return premium of the asset class.

Another important area of recent research, concerns the interdependence between PD and PE funds. Buchner, López-de-Silanes, and Schwienbacher (2022) provide one of the few analytical investigations into affiliated private debt funds,

whereby private equity firms create credit vehicles to lend directly to their own portfolio companies. They find that while these structures improve deal coordination, they often shift value toward the PE side, which leads to the affiliated debt funds underperforming in related deals. The study also highlights natural concerns around governance, transparency, and investor alignment, with worries of potential conflicts of interest during these negotiations. The IMF (2024) raises regulatory alarms about systemic risks, given the lowered monitoring of these funds, arguing that PD funds operate in a “shadow banking” space with limited oversight, low transparency, and potential exposure in times of distress. This is especially important because private credit already makes around 7% of credit extended to non-financial corporations in North America, enough to demand caution and careful review should development and interactions go unbridled (IMF, 2024).

So, from extensive research of the existing literature in this area, it can be concluded that despite the exponential growth of private debt as an asset class, academic research on the topic remains limited and fragmented. Moreover, while industry reports frequently cite diversification benefits and resilience, peer-reviewed research rarely evaluates private debt's actual impact on portfolio optimization or efficient frontier modeling. The interaction between PD and PE, especially in related transactions, has also raised concerns around opacity and potential conflicts of interest, yet remains quite underexplored in academic frameworks.

Therefore, this thesis seeks to address these gaps by empirically testing the performance and volatility profile of private debt, especially relative to PE and VC, assessing its impact on portfolio efficiency using MPT, and exploring its hybrid role as both a financing and structuring tool in Alternative Investment funds. In doing so, it contributes new evidence to a growing but still incomplete body of research on one of the most dynamic and prosperous segments of the capital market landscape.

3. Performance Analysis of Private Debt

The evolution of PD from a regulatory workaround, to a standalone asset class, has transformed its role in investment portfolios. This section analyzes the empirical performance of private debt in comparison to other alternative asset classes, primarily focusing on its return consistency and volatility, risk-adjusted metrics, interest rate resilience, and investor preferences. It aims to provide a statistically grounded and academically rigorous insight into the asset class's attractiveness in comparison to similar assets in the Private Capital markets, as well as the impact of macroeconomic change.

Survey data from Preqin (2024), cited in BlackRock's Private Debt Report, supports that investor interest in private debt is no longer driven solely by the withdrawal of traditional banks post-GFC, but rather by its demonstrated portfolio resilience and relatively high and stable returns. The results, displayed in Figure 6, identify diversification and reliable income as the leading reasons for institutional allocations to private debt. Notably, high risk-adjusted returns and low volatility ranked above traditional considerations like inflation hedging or absolute return maximization (BlackRock, 2024). This aligns with private debt's growing reputation as a hybrid product, combining some of the downside protection and predictability of fixed income with the customization and upside optionality of private equity.

(Figure 6)

Empirical return data over the past decade substantiates this perception. During periods of elevated interest rates, often assumed to be detrimental to credit instruments, direct lending returned an average of 11.6%, compared to just 6.8% for high-yield bonds and 5.0% for leveraged loans (Morgan Stanley, 2024). However, while this may place private debt favorably against traditional credit, its position within the broader private capital ecosystem remains more modest. Analysis of rolling one-year horizon IRRs for private capital strategies, showcased in Figure 7, indicates that while private debt delivers relatively stable returns, it typically lags in peak performance compared to private equity and venture capital, particularly in high-growth years such as 2021.

(Figure 7)

Moreover, within the broader category of debt assets, it becomes possible to evaluate which sub-strategies provide for the highest returns. At first glance of Figure 8, the most striking feature of the chart is the significant volatility in returns, particularly in Mezzanine & Bridge and Distressed & CSS strategies, which exhibit higher return potential but also greater risk exposure, as seen in sharp fluctuations. The graph also displays cyclical trends, with a particularly sharp downturn in 2020, followed by a rapid recovery in 2021. Real asset

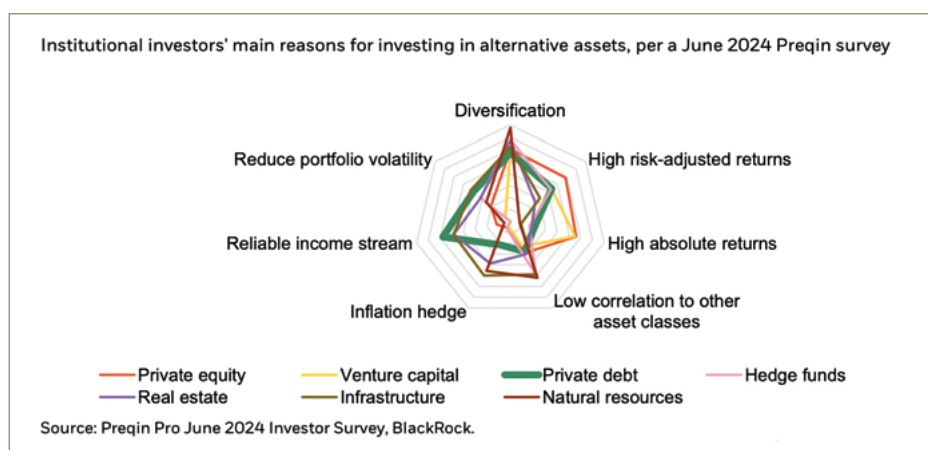


Figure 6: Reasons for Investing in alternative assets. Extracted from Private Debt Reports BlackRock (2024) which makes use of a June 2024 Preqin Survey.

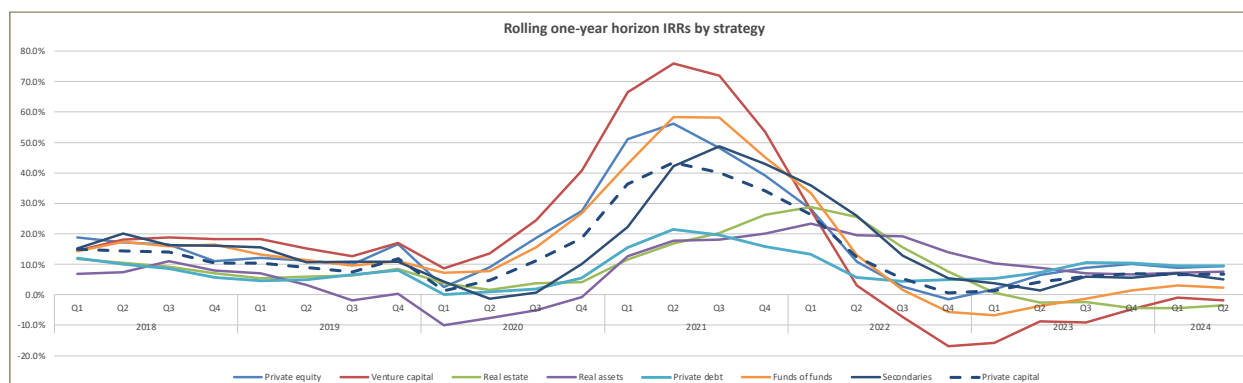


Figure 7: Rolling one-year Horizon IRR of the Private Market asset classes. Data Source: Pitchbook Q2 2024 global fund performance report

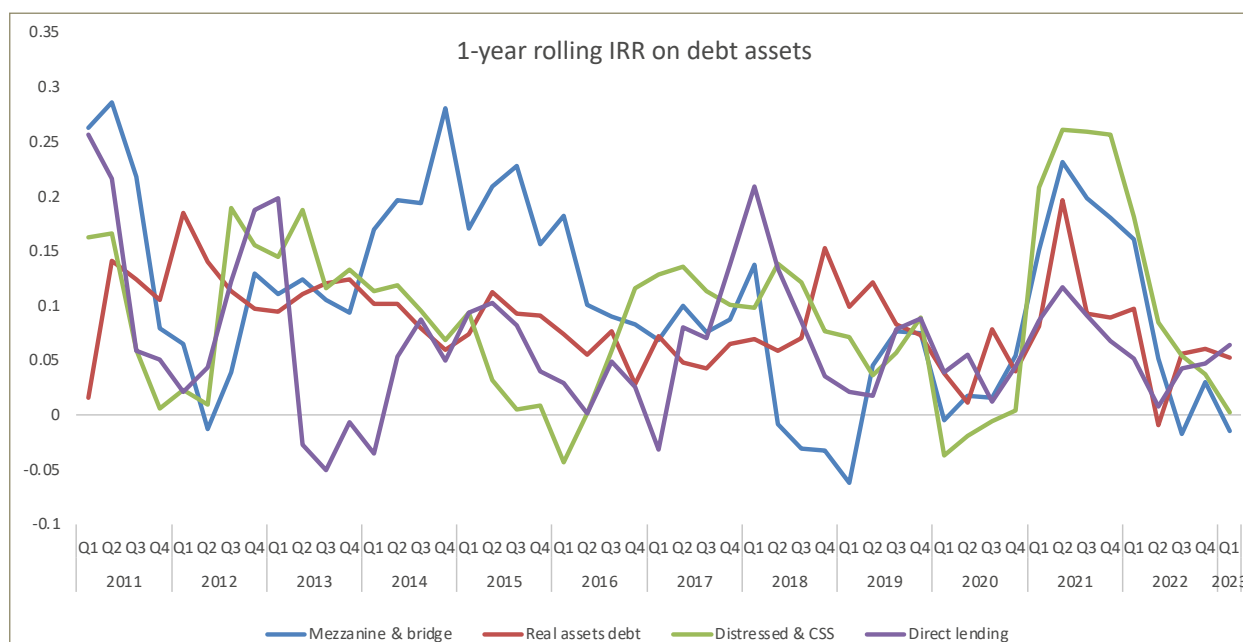


Figure 8: Rolling one-year Horizon IRR of the Private Debt Instruments. Data Source: PitchBook 2024 H1 Global Private Debt report

debt is the least volatile, possibly connected to the more stable value of the collateral assets involved.

(Figure 8)

One of the main reasons expressed by investors in Figure 6 to explain their investment into Private Debt was the reliable income stream and its reduced volatility, which is further supported by the data in Figure 9 showing a comparatively moderate dispersion of IRRs in private debt relative to the other asset classes displayed. While asset classes such as VC and PE exhibit significantly wider spreads in IRRs, indicating both higher

upside potential but also greater risk, private debt provides a more stable return profile, with fewer extreme outcomes. This is achieved while having higher median returns than Real Estate and Real assets and while maintaining one of the highest bottom deciles.

(Figure 9)

Profitability is often discussed in terms of IRR in absolute returns, as has been done throughout this report. What must also be analysed in order to make a fairer more accurate comparison, is what measure provides higher *risk adjusted* returns. In

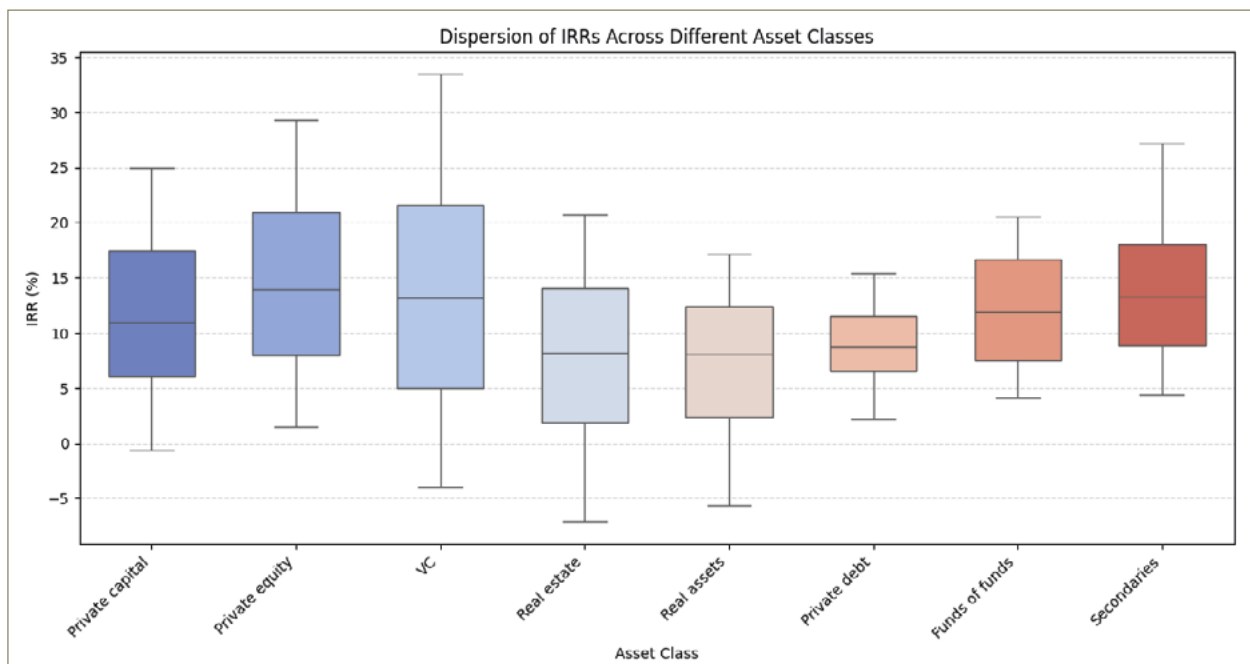


Figure 9: Dispersion of IRR Across different Asset Classes. Python generated (sns.boxplot) using data sourced from Evolution of Total AUM in Private Debt (US B\$). Data Source: Preqin. Historical (actual) data as of Aug. 2024

order to do this the Sharpe ratio of these instruments will be analysed where:

$$\text{Sharpe Ratio} = \frac{R_p - R_f}{\sigma_p}$$

R_p = is the expected portfolio return

R_f = is the risk-free rate

σ_p = is the standard deviation of the portfolio's excess return.

A higher Sharpe ratio indicates that an investment provides a better return per unit of risk taken, making it a critical measure in this analysis in order to create valid and accurate conclusions. For this purpose, the average risk premium since 2012 and the current expected 10 year Risk Premium from industry experts was collected, as well as the IRR of the different asset classes and their volatility during that period. Given the Risk Premium Equation:

Risk Premium = Estimated Return on Investment - Risk-free Rate.

So, the Risk Premium can be used directly in the Sharpe Ratio equation, yielding the results in Figure 10. The volatility inputs are derived from finding the standard deviations of data derived from PitchBook's 2024 H1 Global Private Debt Report. Future expected risk premiums as well as the risk premiums since 2012 are sourced from the PitchBook 2025 Q1 Quantitative Perspectives report, which aggregates forecasts from institutional investors and fund managers.

(Figure 10)

The historical Sharpe ratio demonstrates a relatively strong risk-adjusted return for private debt, outperforming private equity and real estate. However, the projected Sharpe ratio, which incorporates expected risk premiums, suggests a decline in risk-adjusted returns moving forward for all assets. This reflects the broader trend of declining risk premiums across alternative assets, likely influenced by the tightening monetary policy and changing credit market dynamics. This data, however, is based on expert-forecasted and backward-looking risk premium estimates since 2012 and over the next 10 years, and so, it may be subject to esti-

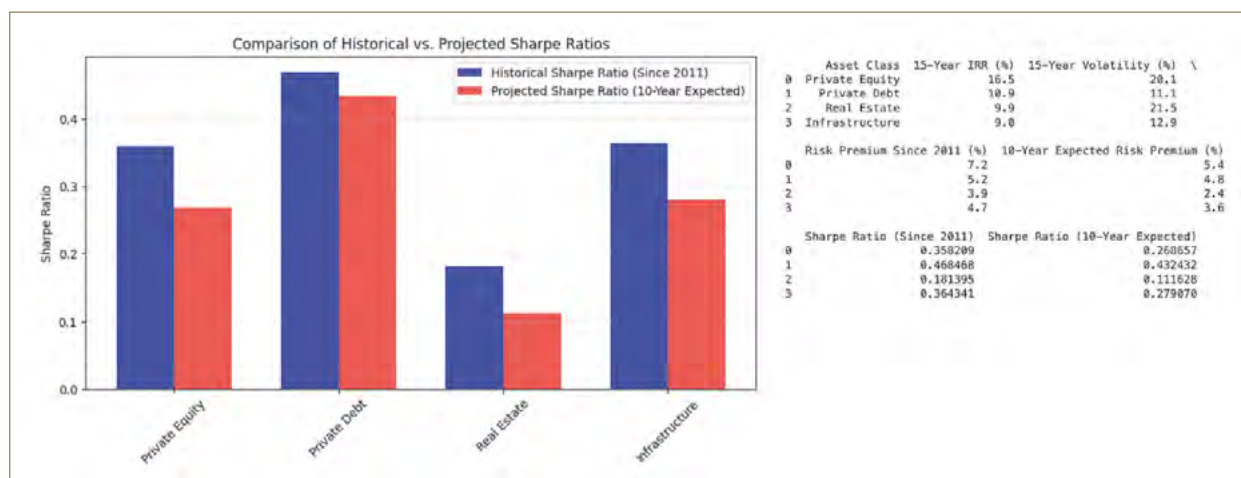


Figure 10: illustrates the comparison between historical and projected Sharpe ratios across key alternative asset classes, using 15-year volatility data from PitchBook (2024) and risk premiums derived from both historical performance and 10-year expert forecasts from PitchBook Q1 2025 Quantitative Perspectives.

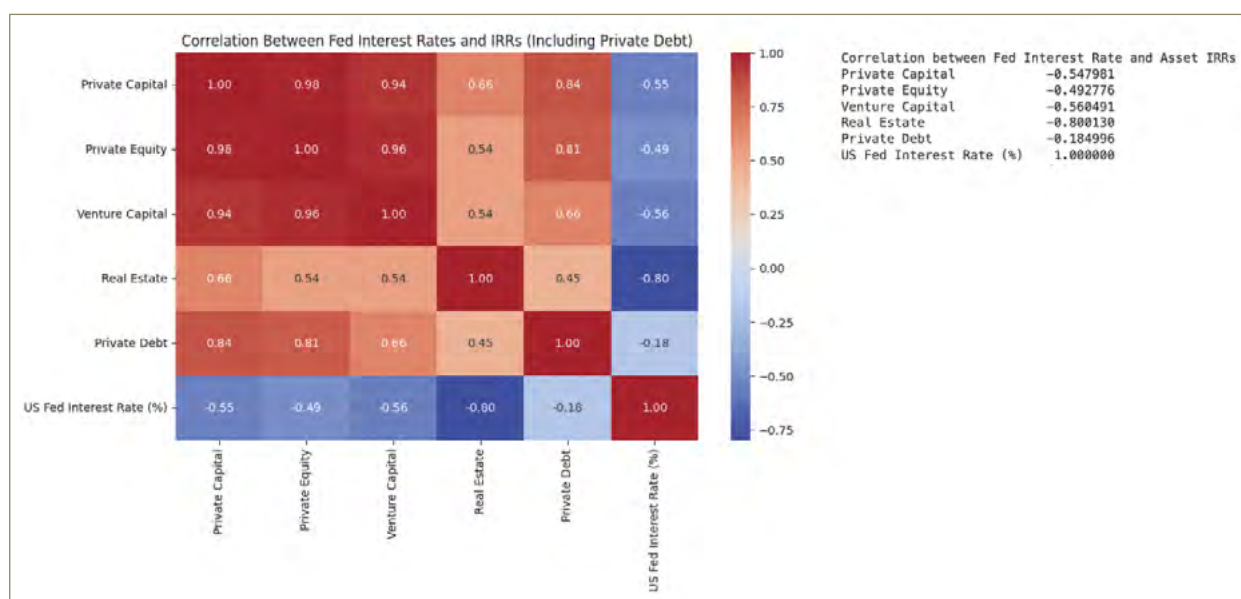


Figure 11: Correlation analysis between Fed Interest Rates and Various US Asset Classes IRRs. The Analysis is conducted with data from 2017-2024 extracted from the Pitchbook Q2 2024 global fund performance report and Extracting the U.S. Federal Interest Rates during this time. The heatmap was generated using the sns.heatmap() function from Seaborn

mation bias, over-reliance on consensus expectations, and smoothing effects that limit its empirical precision. A more robust, data-driven evaluation using real fund-level return data is conducted in Section 5, offering a less theoretical and more market-anchored analysis of portfolio efficiency.

Therefore, while Erel, Flanagan, and Weisbach (2024) argue that private debt funds' risk-adjusted returns are stable but not necessarily superior when accounting for fees and embedded risk

factors, as discussed in Section 2, this critique does not fully align with broader empirical and institutional evidence. As corroborated by research from Cliffwater (2024), CAIA (2024), and PitchBook (2025), and the historical Sharpe ratios seen in Figure 10, private debt does provide excess returns and may even outperform private equity, infrastructure, and real estate.

Crucially, private debt also demonstrates statistically lower correlation with macroeconomic volatil-

ity, specifically interest rate fluctuations. It is often maintained that due to the overall incorporation of floating-rate interest structures inherent to many private debt instruments, this has protected many investors from interest rate volatility, particularly in the recent high-inflationary environment of the early 2020s (Allianz Research, 2024). In order to evaluate this claim, a correlation analysis has been conducted between Federal Reserve interest rates from Q2 2017 to Q4 2023 and asset class IRRs from Q1 2018 to Q2 2024. The inclusion of this two-quarter lag allows for a more precise assessment of the impact of monetary policy changes, as investment performance typically reacts to macroeconomic shifts with a delay, so this is implemented in this study.

(Figure 11)

Figure 11 confirms that private debt exhibits the lowest negative correlation (-0.18) with Fed interest rates compared to other asset classes such as real estate (-0.80), venture capital (-0.56), and private equity (-0.49). This suggests that private debt returns are relatively less sensitive to changes in central bank policy, strengthening the notion that floating-rate structures often embedded in private credit deals act as a buffer against interest rate fluctuations. These findings reinforce the resilience of private debt as an asset class in high-interest environments, supporting its growing attractiveness among institutional investors seeking yield stability.

Overall, this section offers strong validation of private debt's performance advantage on a risk-adjusted basis. While private equity and venture capital may deliver higher raw IRRs, private debt can potentially outperform on Sharpe metrics, exhibit lower volatility, and remain less correlated to macroeconomic shocks. These findings strengthen the argument for greater private debt allocation in portfolios and diversified investment wallets, particularly under risk-constrained mandates. Moreover, its resilience in high-rate environments and stability across cycles solidify its emerging status as not just a substitute for fixed income, but

a foundational pillar of the alternative investment architecture, as will be analysed in the next section.

4. Impact and Use of Private Debt on Alternative Investment funds

Alternative Investment Funds (AIFs), particularly Private Equity (PE) firms, are increasingly engaging with PD not only as borrowers in traditional leveraged buyouts (LBOs) but also as lenders and utilizing these instruments as hybrid financiers in their own portfolio and deals. In addition to market data and reports, this section explores the multifaceted interaction between private equity and private debt using expert interviews.

a. Use of Private debt in LBOs and PE operations

Private equity firms have historically relied on syndicated bank loans to finance LBOs, however, the past five years have marked a dramatic shift toward private debt as a primary funding source. According to BlackRock (2024) using data from the Preqin Survey (June 2024), the share of PD-funded LBOs has now overtaken traditional bank syndicated loans, especially in the US market. Figure 12 illustrates this trend, showing private debt financing peaking in late 2021 to early 2022 before stabilizing at elevated levels.

(Figure 12)

So while funding may be more expensive through private debt resources, the efficiency at which funds are provided, flexibility in structure and terms, and lesser standards clearly make the additional interests a worthy sacrifice for these LBOs.

b. PD as a Complementary Asset Within PE Firms

Extrapolating from the findings in Block et al. and their analysis of 38 U.S. and 153 European private debt investors with combined assets under management (AuM) of at least \$136 billion and €180 bil-

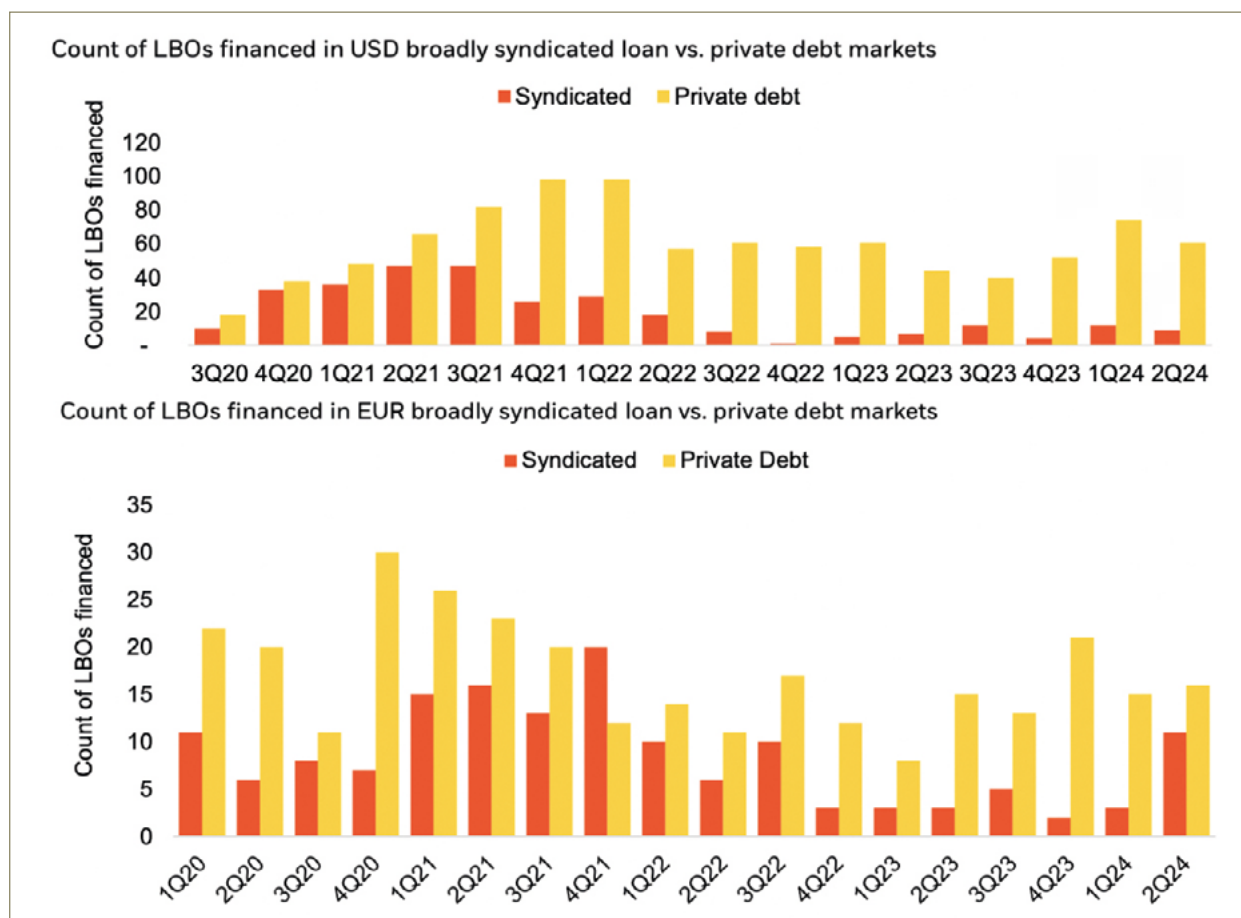


Figure 12: LBO count financed through Syndicated loans vs Private Debt in 1) the U.S. and 2) Europe. Extracted from Private Debt Reports BlackRock (2024). Captures data through June 30, 2024 with PD count based on transactions covered by Pitchbook LCD News.

lion, potentially 25% of the U.S. Private Debt Funds and 40% of the European PDFs could be affiliated with a PE firm, or both fall within the same fund or Asset manager (Block et al., 2023). This growing dual role is exemplified by major investment firms such as KKR, Blackstone, and Apollo Global Management, which have increasingly expanded their operations to include both private equity and private debt strategies (PitchBook, 2024).

In fact, this has led to the rise of “related deals,” in which a private equity (PE) firm finances both the equity and debt portions of a transaction through its affiliated funds. According to Buchner, Lopez-de-Silanes, and Schwienbacher (2023), while there is clear evidence of value being transferred from the debt to the equity fund in related deals, the overall effect on total value creation may still be positive. The study finds that PE-affiliated equity

funds significantly outperform in related transactions, while the affiliated Private Debt funds tend to underperform relative to their standalone peers. Importantly, the combined gains still benefit the PE firm and do not leave limited partners of the debt funds worse off on a fund-wide basis, primarily because these funds compensate for weaker related deal performance through stronger returns in their unrelated transactions, which may not satisfy investors who may feel ‘cheated’ by the lower return related deals. Furthermore, the authors also highlight enduring concerns around conflicts of interest, as the PE firm may prioritize equity-side outcomes when managing internal lending structures.

I. The Expert Interviews

To obtain a more comprehensive view of Private Debt, as well as its integration into the overall

financial environment, five expert interviews with top practitioners in the private debt (PD), venture debt, and alternative investment spaces were conducted. These interviews offer more nuanced, real-world perspectives on the role PD plays in filling structural financing gaps and responding to the limitations of traditional bank lending, particularly in the Spanish market (in which all interviewees were based).

A central theme found across all interviews was the flexibility and adaptability of PD instruments, particularly compared to the rigid structures offered by banks, which all experts identified as crucial to its success. Emphasizing that PD is not just a substitute funding source but also a strategic enabler able to be built to fit the different dynamics, growth cycles, and cash flows of a company. High collateral interest loans, mezzanine financing, and revenue-linked structures were repeatedly cited as tools that allow investors to optimize return profiles while maintaining control over downside risk. Understandably, IRR targets varied by strategy and by interviewee: generally, 10–14% in direct lending and 14–25% in venture and hybrid structures. Most transactions mentioned by the participants included collateral or performance-based triggers to manage risk, and deal sizes ranged from €750K to €15M, with loan-to-value ratios typically between 20% and 70% when applicable.

Several interviewees underlined that especially in Spain, bank retrenchment following Basel III and IV reforms has resulted in a continuous disparity in credit availability for SMEs especially affecting asset-light businesses. Due to industry classification or collateral constraints, even companies with strong cash flows are often judged unfit for bank financing. One participant, formerly a banker and now a PD fund manager, confirmed that companies were frequently denied loans for reasons unrelated to their actual repayment capacity; he had personally had to do this many times, and recalls the struggle of being forced to let good opportunities go. This inefficiency, he

argued, “is exactly where PD finds its role, not as an emergency solution, but as an intelligent one”, exploiting the opportunities that typically “don’t fit in the algorithm” used by traditional banks.

In this regard, PD is seen more and more as a distinct asset class with strategic advantages rather than as a compromise between equity and debt. Venture loan experts underlined the non-dilutive benefit of solutions such as convertible debt and equity kickers. These tools let early-stage companies raise money without giving out ownership prematurely. As one interviewee put it, when you’re growing fast, “there’s nothing more expensive...than equity.”

Another insight consistently mentioned was the mismatch between Spanish regulatory frameworks and the needs of modern PD strategies. Interviewees confirmed that structures such as the Sociedad de Capital Riesgo (SCR) and Sociedad de Inversión de Capital Cerrado (SICC) have certain limitations to the use of debt in many PE and AIFs, particularly involving senior lending. This was identified as the biggest reason why PD and Equity strategies are not used together in funds and intertwined more often, the regulatory limitations faced and the strict traditional fund mandates¹ found in Spain. As a result, it was found by various interviewees that funds sometimes will establish their operative vehicles in Luxembourg or other jurisdictions with more flexible and tax efficient regimes, while using the Spanish entities for “consulting” functions only. These structural hurdles were cited as a major constraint on local fund formation and innovation.

Importantly, experts were divided on whether debt and equity should be managed within the same fund or kept completely separate. While some highlighted the operational synergies and cash reinvestment potential of combining the two (noting the recurring distributions PD offers versus the longer exit cycles of PE), others emphasized the need for differentiated governance and risk frameworks. Nevertheless, there was consensus that hybrid firms, those capa-

¹ Fund mandates here makes reference to the “folleto informativo” which are required, regulated, and binding documents for certain Alternative Investment vehicles in Spain regulated by the CNMV under Law 22/2014

ble of deploying both capital types, do have a significant competitive edge, particularly when tailoring capital stacks in complex deals.

Participants also addressed risk pricing and market saturation, and while they all agreed on the continued integration of PD in Spain, several warned of potential yield reduction as the market matures, and special opportunities become increasingly hard to find. Looking forward, the Spanish PD market was broadly seen as a high-potential but underdeveloped space, and key sectors identified for growth included technology, renewable energy, and healthcare segments, where bank lending is structurally constrained. However, the continued growth of PD will depend not only on demand, but also on improvements in regulatory alignment, investor education, and market infrastructure without which interviewees agreed full growth and adoption of PD would not be possible

Overall, the expert interviews reinforce the central argument of this thesis: that private debt is no longer merely an adjunct to traditional finance but a critical component of modern capital markets. The findings also validate the findings of the next section relating to MPT modeling, providing a real-world anchor to the theoretical and empirical components of this work. In short, these practitioner perspectives help situate private debt not only as an opportunistic strategy, but as a maturing and strategically central part of the private capital landscape.

5. Enhancing Portfolio Efficiency through Private Debt Allocation

The purpose of this section is to empirically test one key question of this paper, that private debt, when used alongside other private market instruments, can materially enhance the efficiency of investment portfolios. By constructing and analyzing optimal portfolios composed of proxies for private equity (PE), private debt (PD), and venture capital (VC), this evaluates whether and how PD contributes to more favorable risk-return trade-offs. This analysis applies Modern Portfolio Theory (MPT)

expanded through the use of Merton's envelope portfolio framework, offering complementary insights into constrained and unconstrained asset allocations under realistic market assumptions. The findings provide quantitative support for the thesis that private debt improves portfolio efficiency, particularly when constraints reflective of institutional investment mandates are respected.

a. Data Extraction, Cleaning, and Selection Process

All fund price data was extracted from Bloomberg Terminal using the Bloomberg Excel Add-In. Specifically, the total return (TOT_RETURN) series rather than the price (PX_LAST) series for these funds was downloaded, because total return accounts for both capital appreciation and reinvested dividends or distributions, making it a better representation of an investor's realized performance over time. This choice is especially accurate in strategies like private debt, where repayments and payout structures are significant. In the following analysis they were thus used as price levels in order to construct the returns.

The study focused on funds that are publicly traded proxies for private investment strategies. The dataset spans from 2015 to April 2025, making sure to capture a wide enough time frame, over ten years of historical performance, to be able to perform accurate simulations. The Bloomberg exports were formatted such that the first row identified each fund, and the first column indicated the date, allowing easy computation of daily returns. After this, the data was cleaned to remove any textual rows, using Python (pandas, numpy) and Excel, dates were converted into proper formats, and rows with missing values were eliminated. Several candidate funds were ultimately discarded due to insufficient data, significant missing values, or anomalous behavior inconsistent with their category's typical volatility or return profile; the final five were filtered from over 45 choices originally:

- KKR & Co. (KKR) and Blackstone (BX): Publicly traded private equity firms that closely represent the risk-return dynamics of traditional buyout

funds. Both exhibit high volatility and high historical returns, aligning well with the behavior of PE funds.

- **ARCC** (Ares Capital Corporation) and **MAIN** (Main Street Capital): Business development companies (BDCs) that reflect private debt strategies. These entities engage in middle-market lending and generate stable income, with moderate returns and relatively lower volatility compared to PE.
- **ARKK** (ARK Innovation ETF): Used as a proxy for venture capital, ARKK captures the essence of high-growth, high-volatility investments in early-stage tech-oriented innovation.

The selected funds were chosen not only based on data availability but also due to their fundamental alignment with the investment characteristics of the asset classes they represent. The returns were computed from the daily TOT_RETURN, daily log returns were computed using the natural logarithm of the ratio of successive total return values. These daily log returns were annualized by multiplying the mean by 252.

$$r_t = \ln \left(\frac{P_t}{P_{t-1}} \right)$$

The following table (*Table 1*) presents the key descriptive statistics for each fund, including:

- **Annualized Return (%)**: based on traditional arithmetic returns

- **Annualized Log Return (%)**: calculated from log returns and scaled by 252 trading days

- **Annualized Volatility (%)**: the standard deviation of daily log returns, multiplied by $\sqrt{252}$ to annualize.

(*Table 1*)

These statistics highlight key characteristics of each asset class. As expected, private equity proxies (KKR and BX) show the highest returns but also the highest volatility. Private debt proxies (ARCC and MAIN) on the other hand, demonstrate lower returns but also substantially lower volatility, supporting their role as stabilizers in diversified portfolios. Meanwhile, ARKK, the proxy for VC investing, shows high arithmetic returns but also the highest volatility among the sample. This is consistent with the speculative nature of early-stage innovation exposure; the gap between its arithmetic and log returns, much larger than that of other funds, also highlights the impact of extreme volatility on long-term performance.

Finally, in order to assign the risk-free rate before completing the analysis, an average yield on the 10-Year U.S. Treasury Bond from 2015–2025 was used, consistent with the study’s historical range. According to the Federal Reserve Bank of St. Louis (FRED, 2024), this yield averaged approximately 2.3%, which avoids the forward-looking bias of using solely 2023–2024 levels that spiked due to inflationary tightening. Together all this data forms the foundational inputs for all the following portfolio calculations

	Fund	Annualized Return (%)	Annualized Log Return (%)	Annualized Volatility (%)
KKR	KKR	24.28	19.12	35.13
ARCC	ARCC	16.10	12.61	25.40
ARKK	ARKK	17.10	9.59	38.33
BX	BX	25.16	19.34	34.98
MAIN	MAIN	17.82	14.50	26.71

Table 1: Annualized performance metrics for selected funds. Comparison of arithmetic return, log return, and annualized volatility for each fund based on total return data from Bloomberg (2015–2025).

b. Theoretical Framework: Sharpe Ratio, GMVP, MPT, and Merton Theory

Modern Portfolio Theory (MPT), pioneered by Harry Markowitz (1952), provides the theoretical foundation for portfolio optimization. In his seminal work “Portfolio Selection”, Markowitz argued that investors should consider expected return as a “desirable” thing and variance (or standard deviation) of returns as an “undesirable” thing. In other words, rational investors seek to maximize return for a given level of risk or equivalently minimize risk for a given level of return. This trade-off gives rise to an efficient frontier, the set of all portfolios offering the highest expected return for each level of risk (volatility) (Elton, Gruber, Brown, & Goetzmann, 2014). Any portfolio lying below this frontier is suboptimal (it has inferior returns for the risk), while portfolios on the frontier are mean-variance efficient.

Under MPT, each asset is characterized by its expected return, and correlations with other assets. Because returns are not perfectly correlated, diversification can reduce portfolio volatility: combining assets that do not move in lockstep produces a portfolio variance lower than the weighted average of individual variances. This research rests on several assumptions, firstly, it implicitly assumes asset prices follow lognormal distributions, a common assumption in both discrete and continuous-time finance frameworks; here, log returns are preferred for their additive properties. This aligns with empirical evidence suggesting that total return series (including reinvested dividends) more closely follow lognormal paths over long horizons (Campbell et al., 1997). Second, the application of MPT and the Merton framework assumes rational, risk-averse investors operating in frictionless and informationally efficient markets, with the ability to diversify away from unsystematic risk (Mangram, 2013). Moreover the analysis assumes that the five selected publicly traded proxies (KKR, BX, ARKK, ARCC, and MAIN) adequately reflect the broader asset classes of private equity, venture capital, and private debt. And lastly, that the risk-free rate is fixed at 2.3% throughout the portfolio simulations to reflect an average long-term baseline for institutional investors over the time period evaluated (2015–2025).

Prior to the main calculations, the *Covariance Matrix* was calculated, which is a foundational element in Modern Portfolio Theory, capturing the pairwise co-movements of asset returns. This structure is essential for calculating portfolio variance, as it incorporates not only individual asset volatilities but also their interdependencies, which allows the quantification of diversification benefits. Here, Python’s built-in `returns.cov()` function was used to compute the sample covariance matrix of the daily log returns. Multiplying the result by 252 converts it to an annualized scale, which is required for consistency with annualized return estimates in the portfolio models. This matrix was visualized using a heatmap, as seen in *Figure 13*, and it revealed that private debt proxies (ARCC, MAIN) had consistently lower covariance with equity-focused funds (KKR, BX, ARKK), reinforcing their diversifying role in the portfolio.

(Figure 13)

From this data, the principles of Modern Portfolio Theory (MPT) (Markowitz, 1952) were used. However, his original work relied on numerical and graphical analysis for a small number of assets and did not include closed-form solutions. The matrix-based closed-form expressions used today to calculate the Global Minimum Variance Portfolio (GMVP) and the Maximum Sharpe Ratio (MSR) portfolio were first formally derived by Robert Merton (1972) in “An Analytic Derivation of the Efficient Portfolio Frontier.” Merton used linear algebra and constrained optimization to solve for portfolio weights explicitly, thereby extending Markowitz’s conceptual framework into a fully analytical one:

GMVP:

Where Σ is the covariance matrix, $\mathbf{1}$ is a vector of ones, and w^* is the optimal weight vector:

$$w^* = \frac{\Sigma^{-1}\mathbf{1}}{\mathbf{1}^T \Sigma^{-1} \mathbf{1}}$$

Maximum Sharpe Ratio

$$w^* = \frac{\Sigma^{-1}(\mu - R_f)}{\mathbf{1}^T \Sigma^{-1}(\mu - R_f)}$$

matrix of returns, $\mathbf{1}$ is a vector of ones, μ is the vector of expected asset returns and R_f is the risk-free rate.

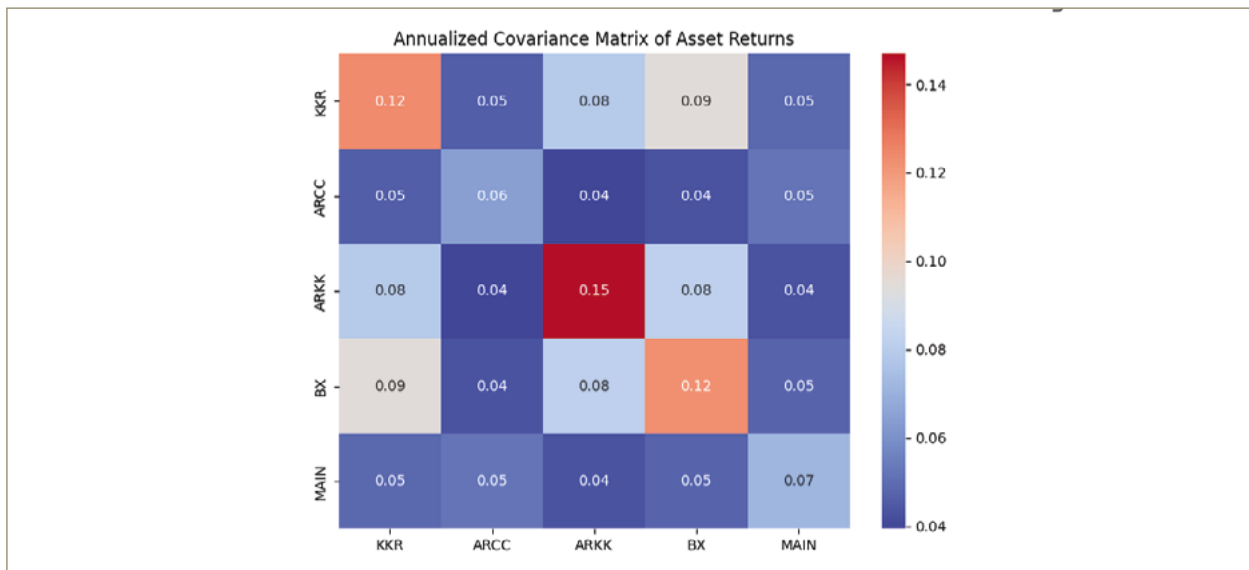


Figure 13: Annualized Covariance Matrix of Asset Returns computed using Python with the expression `returns.cov() * 252`, where `returns` refers to daily log returns. The heatmap was generated using the `sns.heatmap()` function from Seaborn.

However, real-world investment scenarios typically involve constraints such as the prohibition of short-selling, particularly difficult in the case of some funds because of their illiquid nature. These constraints make the problem analytically intractable, necessitating numerical optimization. As such, the GMVP and MSR portfolios were computed using the Sequential Least Squares Programming (SLSQP) algorithm via Python's `scipy.optimize.minimize()` function which enables constrained nonlinear optimization. A third portfolio in this analysis follows the Envelope Portfolio methodology from Merton (1974), Proposition 1, where the tangency portfolio is generalized in a continuous-time, unconstrained framework. While this thesis applies it in a static, discrete-time setting, it retains the core logic of that envelope formulation, serving as a theoretical upper bound on efficiency, unconstrained by short-selling or leverage limits.

Together, these three models allow us to examine how private debt contributes to portfolio efficiency under both real-world and idealized conditions.

Global Minimum Variance Portfolio (GMVP):

The Global Minimum Variance Portfolio (GMVP) is the portfolio on the efficient frontier with the lowest possible risk (the leftmost point of the frontier).

Intuitively, the GMVP is achieved by a weight combination that minimizes portfolio variance, often heavily weighting lower-volatility assets and those with diversifying correlations. In this case, realistic constraints of no short sales are imposed on this portfolio, and the sum of the weights must equal to one.

$$\min_{\mathbf{w}} \quad \mathbf{w}^T \Sigma \mathbf{w} \quad \text{s.t.} \quad \sum w_i = 1, \quad 0 \leq w_i \leq 1$$

Maximum Sharpe Ratio Portfolio (Tangency Portfolio, Constrained):

This portfolio maximizes the Sharpe Ratio, so it is equivalent to finding the point of tangency between the efficient frontier and the Capital Allocation Line (CAL), a straight line from the risk-free rate that represents all possible combinations of the risk-free asset and a portfolio of risky assets. The optimal tangency point maximizes this slope under the same realistic no-short-selling constrained to:

$$\max_{\mathbf{w}} \quad \frac{\mathbf{w}^T \boldsymbol{\mu} - R_f}{\sqrt{\mathbf{w}^T \Sigma \mathbf{w}}} \quad \text{s.t.} \quad \sum w_i = 1, \quad 0 \leq w_i \leq 1$$

Merton Envelope Portfolio (Unconstrained):

Merton (1974) extended portfolio theory through his envelope portfolio framework, deriving a

closed-form solution for the unconstrained optimal risky portfolio under continuous-time, frictionless conditions:

$$\mathbf{w}^* = \frac{\Sigma^{-1}(\mu - R_f)}{\mathbf{1}^\top \Sigma^{-1}(\mu - R_f)}$$

The numerator represents the vector of excess-return-adjusted risk contributions, and the denominator scales the portfolio weights to sum to one. This formulation mirrors the envelope portfolio presented in Merton (1974), where the portfolio weights are derived from excess-return-adjusted contributions normalized to sum to one. While this thesis does not implement Merton's full intertemporal consumption-investment model, the envelope solution serves as a useful static benchmark.

Each of these portfolios illuminates a different facet of optimal investing. The GMVP reflects a risk-averse, fully invested portfolio with practical constraints. The MSR portfolio targets efficient risk-adjusted performance under realistic conditions and the Merton solution highlights the theoretical maximum Sharpe ratio possible with less theoretical constraints. Together, they provide a robust lens through which to evaluate the role of private debt in a diversified portfolio.

c. Portfolio Optimization Results and Interpretation

Building on the theoretical foundations and methodologies discussed in Part B, this section presents and interprets the results of the portfolio optimization process using the five selected funds: KKR, BX, ARKK, ARCC, and MAIN. The optimized portfolio weights for the three portfolios construct-

ed and corresponding performance metrics are presented in Table 2.

(Table 2)

The GMVP, designed to minimize total portfolio variance under realistic constraints, assigns over 78% of its allocation to private debt vehicles (ARCC and MAIN), highlighting their role as low-volatility diversifiers. The MSR portfolio, optimized to maximize risk-adjusted return under the same constraints, shifts some weight toward private equity (BX and KKR) while still allocating over 40% to MAIN, indicating that private debt continues to play a stabilizing role even when return maximization is prioritized. Finally, the Merton portfolio, unconstrained by real-world limits, demonstrates a highly leveraged position, including a short allocation to ARKK (-34.35%) and heavily overweighting BX and MAIN. While this theoretical solution achieves the highest Sharpe Ratio (0.592), it comes at the cost of practical investability due to extreme leverage and short exposure.

Importantly, when evaluated individually, none of the funds analyzed outperform the optimized portfolios in terms of Sharpe Ratio. The best-performing single fund, BX, yields a Sharpe Ratio of 0.487, while both the Max Sharpe portfolio (0.556) and the Merton tangency portfolio (0.592) achieve superior risk-adjusted returns. Even the GMVP, which is purely focused on minimizing risk, achieves a Sharpe Ratio of 0.476 while maintaining a much lower volatility than any standalone fund. This illustrates the empirical value of diversification and optimization: through systematic portfolio construction, it is possible to exceed the efficiency of any standalone asset, even those with strong

	Portfolio	KKR	ARCC	ARKK	BX	MAIN	Expected Return (%)	Volatility (%)	Sharpe Ratio
0	GMVP (Constrained)	2.16%	50.22%	10.32%	8.67%	28.63%	13.56	23.67	0.476
1	Max Sharpe (Constrained)	23.13%	6.67%	0.00%	29.78%	40.42%	16.88	26.23	0.556
2	Merton Tangency (Unconstrained)	33.92%	9.55%	-34.35%	44.70%	46.17%	19.73	29.46	0.592

Table 2: Final Portfolio Allocations and Risk-Return Metrics for GMVP, Max Sharpe (Constrained), and Merton Tangency Portfolio (Unconstrained). Computed using daily log returns, annualized, under a risk-free rate of 2.3%.

absolute performance, because the imperfect correlations between assets reduce total portfolio variance (Hight, 2010).

The simulation of the efficient frontier further contextualizes these results. To generate the frontier, 5,000 portfolios were simulated using randomly assigned weights, constrained to sum to one and disallowing short sales. Each portfolio's expected return and volatility were calculated from the annualized mean vector and covariance matrix of the daily log returns. The Python implementation relied primarily on `np.random.dirichlet()` to generate random weight vectors, and matrix operations to derive the return and risk of each configuration. These were plotted using `matplotlib.pyplot.scatter`, with color gradients representing Sharpe Ratios. Figure 14 displays the resulting efficient frontier, where the GMVP (orange), MSR (red), and Merton (green) portfolios are plotted onto the same graph for comparison.

(Figure 14)

The GMVP lies at the lower-left boundary of the frontier, as expected. The constrained MSR portfolio lies at the upper edge of the feasible region, marking the highest achievable Sharpe ratio under no-short-selling constraints. The Merton tangency portfolio appears above the constrained efficient frontier because it is based on a different theoretical framework, the 5,000 simulated portfolios reflect real-world constraints like no short-selling, the Merton model assumes a frictionless market where borrowing, lending, and short-selling are fully allowed. This leads to a higher expected return for the same level of risk, leading to an upward shift of the efficient frontier. Although it technically lies on a separate, unconstrained efficient frontier, it is shown here for comparison to illustrate how relaxing investment constraints expands the opportunity set and improves theoretical efficiency. While these results create clear support for the overall

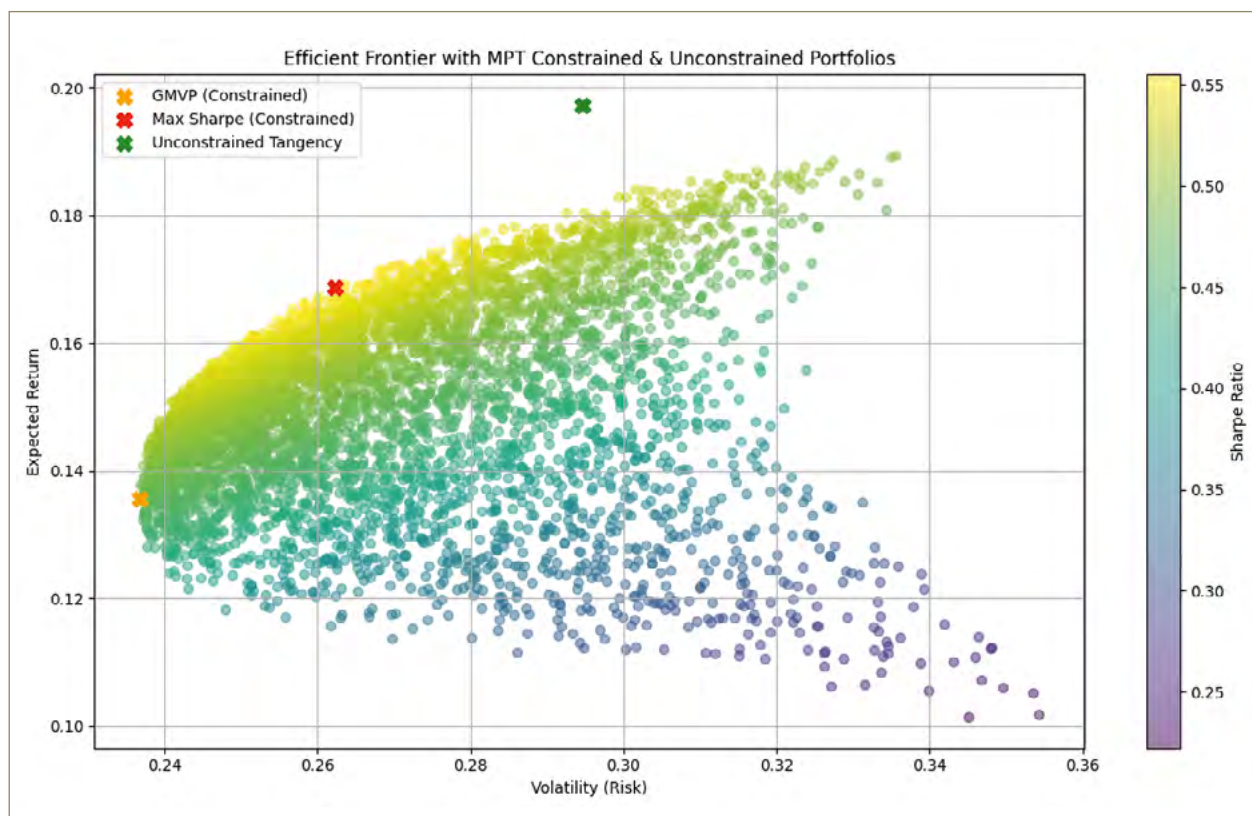


Figure 14: Efficient Frontier of 5,000 Simulated Portfolios. The plot shows expected return against volatility, with color gradients representing the Sharpe Ratio and the three optimized portfolios, GMVP, MSR (constrained), and Merton (unconstrained), are marked and compared.

topic of this thesis, the results will be evaluated more thoroughly in the conclusions.

6. Conclusions

This thesis has explored private debt (PD) as a quantitatively grounded, structurally relevant asset class, evaluating its real-world performance characteristics, strategic implications, and integration within private capital ecosystems. The combination of macroeconomic analysis, portfolio optimization simulations, and expert interviews, has allowed to demonstrate that private debt not only helps in diversifying, and improving risk-adjusted returns, but also plays a strategic role in the structuring, and adapting the liquidity of current private market portfolios.

The MPT simulated portfolios constructed using Bloomberg total return data from 2015-2025, showed that PD proxies received the highest weights in volatility-minimizing configurations. In the Global Minimum Variance Portfolio (GMVP), MAIN and ARCC, representing PD, collectively received nearly 79% of the total allocation as seen in *Table 2*. This concentration contributed to reducing overall portfolio volatility to just 23.67%, a level lower than that of any individual fund in the dataset (*Table 1*). This reinforces private debt's role as a volatility anchor, especially in risk-sensitive situations. Meanwhile, the constrained Maximum Sharpe Ratio (MSR) portfolio assigned over 47% of its weight to PD, with MAIN alone surpassing 40%, again validating the asset class's relevance in enhancing risk-adjusted performance under realistic allocation limits. Both the MSR and Merton portfolios produced sharpe ratios that exceeded those of any single fund in the sample, including high-performing PE proxies like BX and KKR. Even in the unconstrained Merton framework, PD remained central: MAIN received the highest long exposure, and ARCC also received a positive (long) allocation in the portfolio, further underscoring PD's efficiency relative to higher-volatility growth strategies. These results show that for institutional investors facing uncertain macro conditions, PD

offers a unique blend of defensiveness and excess return potential that is rarely matched elsewhere in the private capital spectrum.

These simulation results align with broader market data; the correlation analysis conducted in Section 3 showed that PD has the lowest negative correlation with interest rate movements among all asset classes tested, with a value of -0.18. By contrast, PE showed a -0.49 correlation and VC a more pronounced -0.56. These results are mirrored in current market research (PitchBook, 2024) emphasizing PD's ability to resist monetary tightening cycles, particularly in direct lending structures. Furthermore, the return dispersion of these assets displayed on *Figure 9* exhibits that PD has one of the narrowest interquartile ranges among private asset classes, reaching a lower downside volatility while still having competitive returns, as is supported by the Sharpe ratio analysis displayed in *Figure 10*.

Section 4 provides additional insight into how PD performs in the real market, and its growing integration into broader alternative investment vehicles and other strategies in a complementary manner. Most importantly, these expert insights confirmed the expanding role of private debt (PD) not only within credit markets but across the broader investment landscape. Increasingly, businesses and equity deals rely on PD to scale and operate, while funds themselves are more frequently incorporating PD as a core instrument within their portfolios. The interviews highlighted PD's ability to engineer creativity in structuring deals across different businesses, and crucially offers a realistic view of how PD embeds risk mitigation mechanisms directly into deal structures. This qualitative lens added a behavioral dimension and a practical world view and confirmation of many of the trends that are quantitatively evaluated and found throughout this paper.

Taken together, the thesis supports several theoretical and practical contributions, mainly it supports that PD enhances portfolio efficiency, and does provide excess returns, not only in theory but also under realistic institutional constraints. Reports

by CAIS (2023), Preqin (2022) and Cliffwater (2024) identify private credit as an efficient diversifier with high risk adjusted returns and low correlations to both equities and traditional fixed income. In line with these and counter to literature that question the persistence of alpha in private debt (Erel et al, 2024), the findings confirm that within portfolio optimization, the risk return is positive and a high allocation of PD is set.

Despite these strengths, the study is not without its limitations. Firstly, the use of risk premium inputs in Section 3, which were derived from expert opinions (PitchBook, 2025), therefore may reflect optimistic or backward-looking biases inherent in their estimation. Moreover, the interviews in Section 4 are centered strongly on the Spanish Market and the sample of interviewees is small, thus making it less reflective of the broader fund market.

In Section 5, the simulation model draws from five public proxies that, while carefully selected, do not fully replicate the characteristics of actual private funds. ARCC and MAIN approximate PD behavior, while KKR and BX stand in for PE, and ARKK represents high-volatility VC. While they were chosen for their fit to the asset class they represent, they are not a comprehensive or flawless reflection of the entire asset class, they serve more as indicative representations than definitive ones. Additionally, the simulation methodology rests on key assumptions that may not hold in practice, most notably, it assumes return distributions are approximately normal and that assets are continuously tradable and liquid. These proxies, being publicly traded, exhibit liquidity profiles and pricing dynamics that differ significantly from closed-end LP-GP fund structures, who in reality, are inherently illiquid. As such, the resulting Sharpe ratios and correlation coefficients provide directional insights, but not fully generalizable conclusions.

Future research should address these methodological constraints with more granular, cross-fund datasets and longer time horizons. One di-

rect next step would involve replicating this study using fund-level data from Preqin, Burgiss, similar or broader access to closed fund data and surveys. This would allow for better benchmarking, more accurate dispersion analysis, and a breakdown of returns by fund strategy and geography. A particularly relevant extension would be to model PD performance under different macroeconomic regimes using stress-test simulations. This would quantify how PD behaves relative to public credit and private equity in scenarios of macroeconomic change, liquidity crunches, or prolonged rate cuts. Finally, a novel and practical suggestion would be to examine how, on the other hand, PD shapes the borrower company's outcomes post-investment. This includes comparing growth and survival rates across firms with different PD structures, such as mezzanine, convertible, or senior secured, and analyzing how often equity-like features (e.g. warrants, conversion rights) are exercised in practice and are successful. This analysis is necessary, in order to review the actual impact of PD on society as a whole, and borrowing companies long-term, to evaluate its real benefits.

In summary, this thesis supports that private debt plays a far more central role in modern investment design than traditional classifications imply. In both simulated portfolios and real transactions, PD delivered strong performance while mitigating exposure to interest rate volatility and equity market swings. Its low correlation, consistent Sharpe ratios, and flexible structuring tools position it as a stabilizer in complex allocation environments. The research affirms key arguments from leading institutional sources and theoretical frameworks, while also pointing to underexplored dimensions, such as the broader PD integration into portfolio investments. As private capital markets evolve, the insights from this thesis suggest that PD will not only persist but expand in strategic importance, functioning as a foundational tool for capital efficiency, portfolio stability, and hybrid fund innovation.

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1 El conjunto de normas y principios que se señalan a continuación se inspiran y toman como referencia las International standards for authors publicadas por el Committee on Publication Ethics (COPE). Ver, Wager E & Kleinert S (2011) Responsible research publication: international standards for authors. A position statement developed at the 2nd World Conference on Research Integrity, Singapore, July 22-24, 2010. Chapter 50 in: Mayer T & Steneck N (eds) Promoting Research Integrity in a Global Environment. Imperial College Press / World Scientific Publishing, Singapore (pp 309-16). (ISBN 978-981-4340-97-7).

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