CHAPTER

Buyouts: A primer

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Chapter outline

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1 Introduction

Thirty-two years ago, Jensen (1989) predicted that the public corporation would be "eclipsed" and largely replaced by other forms of organization. While that prediction looked a bit foolish when its publication was immediately followed by the 1990s IPO boom, after 2000 it proved to be remarkably prescient. Consistent with Jensen's prediction that the public corporation would decline in importance, there has been a

more than 50% decrease in the number of public US firms since its peak of 7509 in 1997: at the end of 2020, there were only 3530 investible stocks available for the Wilshire 5000.[a] At the same time, the size and importance of private capital markets have increased dramatically. Private capital markets now raise more than $1 trillion every year and invest not just in private firms, but also in publicly traded firms, real estate, and privatization of publicly owned institutions.

A new set of financial institutions has developed that has enabled private capital markets to thrive. In this paper, we will explain how these institutions function, present up-to-date evidence on them, and discuss the relevant academic literature. Our discussion focuses on the buyout component of private capital markets, which is sometimes referred to as the leveraged buyout (LBO) market because of the extensive use of debt in these transactions.

Most investing in the private capital markets occurs through funds, which, as we discuss in Section 2, are structured as limited partnerships. In a buyout fund, the limited partners (LPs) make capital commitments that can be drawn down at the discretion of the fund managers, known as the general partners (GPs). These "draw-downs" are used to acquire portfolio companies, which are managed and ultimately sold by the fund. The returns that the LPs receive come from the difference between the cost and the sale price, plus any dividends received.

To raise a fund, the GPs must offer potential LPs a sufficiently attractive return distribution to induce them to invest in the private market rather than in alternatives. Investments in buyout funds tend to be riskier, due to the extensive use of leverage, and less liquid than those in public markets. In addition, their fees and profit shares are substantially higher than vehicles that invest in public securities such as mutual funds. Private market returns, net of these high fees and profit shares, must deliver a premium over comparable public market returns to induce suppliers of capital to invest. Yet, despite this high hurdle, investors have chosen to make extremely large capital commitments to buyout funds because their expectations of returns are high enough to justify taking on the additional risk and illiquidity.

How do buyout funds manage to earn sufficiently high net returns to induce LPs to invest? Part of the answer is the real changes that the GP can make in its portfolio firms. Sometimes the GP does as Jensen (1989) argues and creates value by reducing wasteful expenditures of free cash flow. But not always—often the value increases come from other sources such as strategic expansions or consolidations, professionalization of management combined with pecuniary incentives for them, providing the firm with capital at times when it does not have other sources of finance, or privatization of an inefficient government operation. In addition, GPs can produce returns for their investors by transferring value from other parties, in particular tax authorities, via the greater use of debt, which is normally tax deductible (within limits).

[a]As reported by https://www.investors.com/news/publicly-traded-companies-fewer-winners-huge-despite-stock-market-trend/. See Doidge et al. (2018) for data and discussion about the decrease in public listings over recent years. We present numerous statistics on private capital markets in Section 4.

Recent literature has documented that it is not just the government which is targeted for wealth transfers; it appears that there are, in some circumstances, systematic wealth transfers from customers, workers and suppliers to buyout fund investors.

Intellectually, the buyout sector provides a plethora of questions to study. There are theoretical questions: How should funds be set up and managers compensated? To what extent does private contracting allow for more efficient resource allocations than a reliance on public markets? There are questions related to portfolio theory and capital markets: How much capital should be allocated to this asset class? How should capital be split between various subsectors (buyouts, VC, real estate, etc.)? How does one go about measuring the risk and return of a fund that makes only around 10 investments, many of which have only one cash outflow and one cash inflow over a 12–15 year period? To what extent do LPs and/or GPs have measurable skills? Corporate finance questions abound: How much value is created by the highly leveraged financial structure of most buyouts? What do GPs do to their portfolio firms to increase their values? Do they transfer wealth from other parties (workers, governments), or do they improve the efficiencies of operations? And perhaps the most important questions concern management and leadership, since at the end of the day, most of the increases in the value of the portfolio firms are likely to come from better managerial decisions: How do private equity funds decide on the managerial teams of their portfolio firms? What do they do to motivate and monitor these teams?[b]

The academic literature has just scratched the surface in its understanding of these and related questions. To make things more complicated (and more fun to study), buyout funds constantly innovate and come up with new types of investments and organizational structures. The private capital market has matured to the point that most major firms today have relied on said markets at some point, and this trend is likely to continue. A useful mantra for those of us who study the private equity industry is that: *Private capital markets are at least as important and far more interesting than public capital markets in the 21st Century economy.*

We begin our discussion of buyouts by explaining in Section 2 how buyout funds are structured and exactly how they work. We discuss the relationship between three broad questions in this section: (1) how is capital intermediated from investors to buyout funds, (2) how do buyout funds structure investments into portfolio companies, and (3) how are the management of portfolio companies incentivized by the buyout fund owners?

Starting with the first question, funds that manage assets for investors are an important form of organization that is not as well understood by most economists as it should be. Most buyout funds are set up as closed-end limited partnerships.

[b]It probably is not a coincidence that one of the most successful buyout general partners, David Rubenstein of Carlyle, has his own youtube series on successful leadership. See: https://www.youtube.com/channel/UCqsN9MYiu1mKSAsYoF6ppTg.

The "ultimate management company" is often a partnership itself, although some have become public companies. Under the ultimate management companies are the fund advisors, who are contracted by the fund to source, diligence, and negotiate deals, and manage them after they are acquired. We discuss a number of issues related to the structure of the fund and its relationship with its LPs, including fees, co-investment opportunities, and the use of lines of credit and other techniques that enable funds to leverage their entire funds. We particularly focus on the manner in which the interests of GPs and LPs in buyout funds are aligned.

The second question relates to the financing of buyouts. As their name suggests, a key feature of LBOs is an extensive use of leverage. Most buyouts secure the leverage against the assets of the portfolio companies. The structure of the debt has some distinct features. We present statistics on the use of leverage, and provide a detailed example illustrating the way in which the debt of a typical buyout is structured.

The third question relates to the relationship between buyout funds and the management teams of their portfolio companies. GPs seek alignment of interests with management, and achieve this by, in most cases, requiring management to acquire significant equity stakes in the portfolio companies. In addition, they structure the equity portion of the capital structure so that such management returns are amplified in the case of success. The details of such remuneration structures are closely guarded, although much progress has been made in liberating data on the private equity sector for academic scrutiny. However, some general trends are clear, and we finish Section 2 with a discussion of the way in which management incentives are structured.

While Section 2 discusses the nuts and bolts of the way in which buyouts are structured, Section 3 focuses on why they occur in the first place. Buyouts deliver returns to investors by improving the performance of the companies that they buy. It is the expectation of these performance improvements that drive the growth of the industry. The ability of a buyout fund to secure capital commitments depends on investors' expectations of its return relative to their relatively high hurdle because of the buyout sector's risk, fees, profit shares, and illiquidity.

How do buyout funds go about improving the performance of portfolio firms? Our discussion follows Kaplan and Strömberg (2009), who classify the changes brought on by buyout funds as *financial engineering*, *operational engineering*, and *governance engineering*. The most important element of financial engineering in a buyout is the dramatic increase in portfolio firms' leverage. This leverage induces the firms' managers to focus their energies on activities that generate the cash necessary to service the higher interest payments. In doing so, managers will decrease the capital available for wasteful investments, which will increase their firms' values. Operational engineering consists of the way in which buyout funds immerse themselves in the operations of their portfolio companies. Funds often will have operating partners who specialize in helping companies in the particular industries that the fund targets. Finally, governance engineering

refers to the improvements in corporate governance brought on by the funds. These improvements typically include smaller but more active boards (compared with similar public companies), and much stronger financial incentives for top management.

Buyout funds almost always link their provisions of financing with control rights. Normally these involve a majority of ownership, but sometimes funds will take minority positions with other rights, such as board seats or the ability to increase their ownership to a majority if pre-specified financial targets are not met. Theoretically, associating financing with control allows funds to make investments that more passive investors cannot. If an investment is positive NPV and a particular strategy not favored by current management is followed, a buyout fund can make the investment and force the management to adopt its favored strategy or change the management team if they will not. In addition, buyout funds are flexible in the types of investments they make. They operate without the mandates that limit other types of investors so that they have more potentially valuable investments available to them. For example, a fund whose stated strategy is to provide equity will often be able, if they think it likely to be profitable, to provide debt to a distressed firm with the hope of negotiating a swap into a controlling equity position.

Section 3 also details some of the particular strategies that buyout firms adopt. These strategies vary from "bust up" LBOs designed to sell off assets and reduce cash flow, to expansions in which the fund provides capital for "bolt on" acquisitions to a firm, to transition-oriented deals where the fund provides an exit for some of the firm's owners while allowing others to remain in control. By being flexible in their investing strategy, buyout funds are able to come up with many ways in which they can earn returns for their investors.

Section 4 provides facts about buyouts which starts with a brief history describing the evolution of the sector. Buyout markets tend to be correlated with the credit cycle. Purchase price multiples and debt contributions tend to go up (down) during economic booms (busts) but returns show a counter-cyclical pattern: years when relatively little capital is raised tend, ultimately, to produce the best returns. While in the past, trade sales to corporate acquirers were the dominant way of exiting, secondary transactions whereby one buyout fund sells to another have become increasingly common. Fund fees have deviated surprising little from the 2 and 20 model—a 2% annual management fee and 20% profit share, or "carried interest"—even as buyout funds have increased dramatically in size.

Section 5 surveys academic research on buyouts. Such research on buyouts and on private capital markets more generally faces two major hurdles. First, the firms that are acquired in buyouts are private after they are acquired, and the majority are private prior to being acquired as well. Consequently, the quantity of data that is available to researchers is far lower than for research on public firms. Furthermore, data on private equity funds themselves—in particular fund cash-flows, fees, details of limited partnership agreements, etc.—are difficult to obtain. Data availability is, in general, improving and there have been some important initiatives that

have made research-quality data more readily available for researchers.[c] Second, even if all private data were available publicly, much data that is commonly used for public firms and markets simply do not exist for private firms and markets. In particular, there are no market prices for firms or funds that are not publicly traded (a few are). And funds receive cash flows from their portfolio companies only at the time of acquisitions portfolio firms, exists, as well as the occasional dividend.

The limited availability of cash flow data combined with the lack of market data for firms and funds makes measuring funds' risk and return much more complicated than the comparable exercise for public firms. For this reason, much research addresses the issue of measuring the funds' returns and the extent to which these returns justify their risk and illiquidity. The most common metric for measuring private equity returns has become the Public Market Equivalent (PME) return. However, this measure has issues of concern to which answers are not obvious, such as how to adjust it for risk, and the appropriate public market benchmark against which to measure a fund's return. For example, should a European fund be benchmarked against European stock market indices, which have underperformed American stock market indices in recent years (making European funds look good relative to American funds that are measured relative to a higher benchmark)? Nonetheless, while studies vary depending on methodology, most find a PME for buyout funds >1, implying that these funds do beat the public markets against which they are compared.

Another topic of research concerns the investors in buyout funds. Investors must decide how much capital to allocate to the sector, and the particular funds to which to commit capital. Portfolio theory does not provide much guidance for these decisions since historical risk and return are so difficult to measure. In addition, given the changes in the industry, past performance is not likely to be a good predictor of future performance anyway. In addition, the choice of funds in which an institution allocates capital can dramatically influence its returns. There have been studies suggesting that these choices are not random. General Partners do appear to differ in their skill to earn returns, and Limited Partners differ in their skill at evaluating General Partners' skills.

An important strand of the literature on buyouts concerns the underlying source of their returns. A number of studies have documented that portfolio firms' cash flows usually increase. But the reason why they increase can vary substantially. Sometimes, funds create value through the approaches discussed in Section 3. However, funds can also transfer wealth from other parties, including workers, the government, suppliers, and customers. Clearly, the source of portfolio firms' increased

[c]In particular, we would highlight the role played by the Private Equity Research Consortium (PERC), which provides access to Burgiss data and programming support to analyze the data. PERC also runs conferences encouraging interaction between academics and practitioners working, or investing, in private equity. More information on PERC is available at https://uncipc.org/index.php/initiativecat/private-equity/

cash flows is an important issue for many reasons, especially public policy toward buyouts, and is likely to be a continuing area of research in the future.

Finally, there is interesting work studying contracting issues in buyouts. As discussed in Section 2, buyouts have a complicated contractual structure, which is likely to be an important driver of their performance. Important research has studied the nature of this contractual arrangement, the extent to which it is consistent with contracting theory, and whether it leads to agency problems between LPs and GPs, and between GPs and portfolio firms.

2 What are buyouts and how do they work?

In this section, we discuss three questions. First, how is equity finance intermediated between investors and the fund? In other words, what is the LP–GP arrangement? We characterize the way in which buyout funds are structured, finance is provided by investors, and fund managers are compensated and regulated. Second, how does a buyout fund finance the purchase of, and design the financial structure of, portfolio companies? Leveraged Buyouts, as their name implies, use significant amounts of debt in their capital structures. We discuss the way in which this debt is structured alongside the equity from the fund. Third, we complete the circle by discussing the financial arrangements that are negotiated between the portfolio companies and their management teams. In particular, we discuss the structure of the equity incentives that management face. One mantra of the private equity industry is to align the interest of all parties, and the extent to which such alignment is achieved is an overarching focus of this section.

2.1 Investors and funds

There are many possible structures that could conceivably be used to make investments in private companies. In the early days of private equity, publicly listed structures were used, such as business development corporations in the United States or investment trusts (such as Investors in Industry, which became 3i) in the United Kingdom. These are typically structured as closed-end funds, which raise capital on public markets via an IPO, and secondary offerings, and then invest in private companies. They can recycle realizations back into new portfolio companies (and are therefore referred to as "ever-green" funds), and must adhere to various rules relating to the distribution of profits to investors in order to retain favorable tax status.[d] Such structures are still used, and are one of the easiest ways in which individual investors can gain exposure to buyouts, but they are not the most common way in

[d]For instance, in the United States a requirement for Business Development Corporations to retain their status as regulated investment companies, they must distribute over 90% of their profits to shareholders. With Regulated Investment Company status, no corporate income tax on profits is paid by the Business Development Corporation.

which buyout funds are organized. However, there has been work studying these structures—which are typically traded on stock markets since they do not have a fixed life—as a way of measuring the returns associated with private equity.[e]

2.1.1 Funds as limited partnerships

The dominant form of LBO fund structure has become the Limited Partnership, which is also used for many other forms of what used to be called "alternative assets" but are by now mainstream—assets such as hedge funds, private credit funds, energy funds, etc. There are two main reasons why Limited Partnerships have become the standard fund structure: (1) tax efficiency for investors, (2) incentive structures and tax efficiency for fund managers.

First, we explain the structure of such funds. In most countries, and certainly those in which private equity is active, it is possible to form limited partnerships, which are a form of partnership in which some of the partners (typically institutional investors) contribute only finance and are not involved in investment decision-making. These investors are referred to as Limited Partners (confusingly, they are Limited Partners of the Limited Partnership). We will use the abbreviation LP to refer to the investors (as limited partners) rather than the partnership itself. The liability of such investors is limited to their invested capital. This limitation is critical for a large institutional investor, with the sort of deep pockets that could attract litigious claimants (for example, if an operating company acted in an anti-competitive way or was negligent). Such investors would not be as protected if they purchased a stake directly in a company and exercised some element of control, for instance, by having board representation. The Limited Partnership structure allows investors to hold significant stakes in private companies without exposing themselves to the risk of litigation.

A Limited Partnership requires a General Partner (GP) to manage the fund and make the investment decisions. In principle, the GP has unlimited liability for the debts and any claims against the partnership. Again, the language is confusing in this respect: often individuals are referred to as General Partners, but the formal General Partner of the fund is typically a separate legal entity, so that individuals do not bear the risks associated with unlimited liability.

Fig. 1 provides an overview of the various entities and the important financial flows. There can be differences in these structures across countries, but the diagram illustrates some key features. First, in any structure, there will be an ultimate management company that is established by the initial founders. This company is sometimes referred to as the "GP"; however, the terminology can be confusing because as each individual fund has a General Partner and the ultimate management company (UMC) does not have to be a partnership (it is common in the United States for this entity to be an LLC). This ultimate management company essentially controls the brand of the fund manager, decides on strategy, and can finance the launching of

[e]See Jegadeesh et al. (2015).

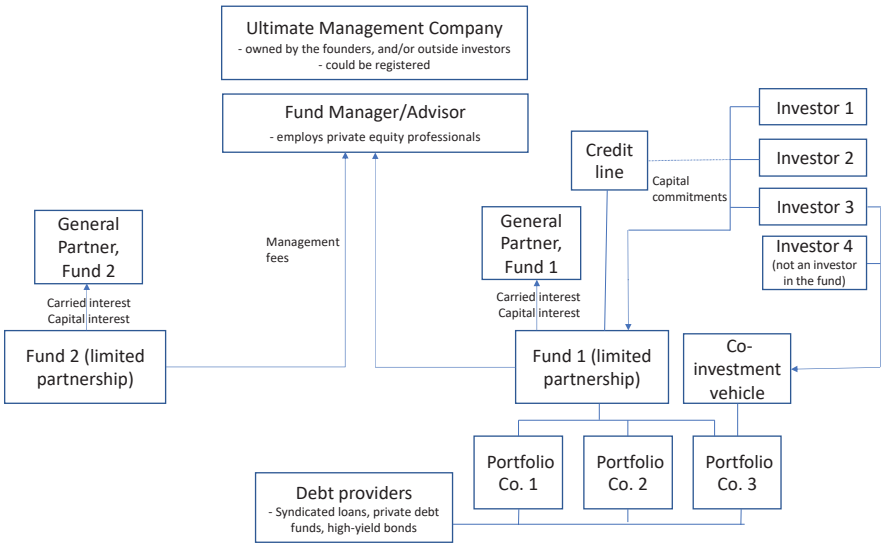


FIG. 1

The typical GP-LP structure.

new funds (for legal work, marketing, investor meetings, etc.). Outside investors can own a stake in the UMC, and a number of the most well-known UMC's have gone public in recent years. Such outside capital can be used to launch new fund strategies (such as private debt, or funds focused on new geographies) so that the founders do not have to provide all the required funds. It can also enable founders to take some money off the table, by selling part of their stake in the UMC. This strategy of investing in UMCs has become very popular, with large funds being managed by Blackstone, Goldman Sachs, and Neuberger Berman (through their Dyal Capital Partners subsidiary) that are dedicated to investing in such stakes. Some of these funds that invest in GP stakes have gone public in recent years.

The second important entity in a buyout structure is the Fund Manager, which is sometimes referred to as a Fund Advisor. This entity employs private equity professionals and provides services across the various funds that are raised. Certain individuals can be focused on particular funds, but often they will provide input into investment decisions across funds.

The third important entity is the Fund. The Fund will engage the Fund Manager to source, diligence, and select deals, in return for a management fee. The UMC will typically raise a number of funds (as they are of limited life and so naturally self-liquidate), and each fund will be established as a separate limited partnership. As noted above, the partnership consists of investors (LPs) who provide capital but do not participate in the investment decisions, and whose liability is limited to their invested capital, and a General Partner, who takes investment decisions and has unlimited liability. To address this potentially unlimited liability, GPs are typically set

up to be "thin" organizations with few assets or employees, and which (somewhat ironically) are usually themselves a limited liability entity (such as an LLC). Consequently, the investment decisions are made at the level of the Fund Manager/Advisor, where the investment professionals are employed.

The distinction between the three entities—the UMC, the Fund Manager/Advisor, and the General Partner—is often not made, and the short-hand of "GP" is used to cover the combination of roles. We will also generally adopt this shorthand, except where there are important distinctions that affect incentives or economics.

The fourth type of entity is the portfolio companies that are acquired by the Fund. LBO funds usually take controlling stakes in the portfolio companies in which they invest. In many cases, this control will involve purchasing all the equity and repaying its existing debts. The "Enterprise Value" of these portfolio companies (i.e., the debt and equity) is paid for partly by the Fund, and partly with external debt arranged by the GP. This debt is raised on the basis that it will be a liability of the portfolio company, rather than the Fund. For this reason, debt providers often refer to LBO GPs as "financial sponsors," because they sponsor the raising of debt on behalf of the portfolio companies. We examine the financing and structuring of portfolio company investments in detail in Section 2.2.

The final, increasingly important entity is co-investment vehicles. In LBOs, it is common for some part of the equity in portfolio firms to be made available to investors outside the fund structure. These investors are often also investors in the Fund—as depicted by investor 3 in Fig. 1—but they need not be (as in the case of investor 4). There has been limited academic research so far on the issues relating to co-investment. Braun et al. (2020) identify several potential motivations for GPs to offer co-investment opportunities. For deals that require a large amount of equity relative to the fund size, the simple motivation may be portfolio diversification. Funds put limits on the proportion of equity that can be invested in any single deal and arranging for some equity to be invested via a separate vehicle can provide the equity above the maximum that the fund can contribute. An alternative approach is to team up with a fund run by another GP in a "club deal," but these have become less common since SEC investigations into possible anti-competitive behavior relating to such deals.[f]

A key feature of co-investments is that they typically involve no, or much reduced, management fees and carried interest payments to the GP that organizes the deal.[g] For LPs in the fund, therefore, they are able to invest additional capital at a lower cost, although this practice will lead to more concentration in their portfolios. Consequently, co-investment opportunities are prized by LPs, who often seek information on the likely extent of such opportunities at the time they are making fund commitments.

The fact that some co-investment is offered to investors (as represented by investor 4 in Fig. 1) who are not LPs in the Fund is more controversial, since they will

[f]See Keyte and Schwartz (2016). Private Equity and Antitrust: A New Landscape. *Antitrust*, *31*, p.21. for details about private equity and antitrust.

[g]Co-investors will sometimes be charged a one-off transaction fee, and will also share in the costs of due diligence, debt arrangement, etc., since these will generally be passed onto the portfolio company.

avoid paying fees to the GP through the fund structure. When GPs do offer such opportunities to outside investors, it is often in the hope that they will become LPs in future funds. Also, some large investors are increasingly able to act quickly and at scale to participate in deals from the start (sometimes referred to as "primary co-invest") and so play a similar role to that of a GP in a club deal. This is particularly true of sovereign wealth funds, some public pension funds (Canadian public pension funds were pioneers as co-investors), and large fund of fund managers, who have large amounts of capital to deploy and use co-investments to boost the net return of their vehicles.

The academic literature on co-investments has tended to focus on whether there is adverse selection in the choice of deals, meaning that the GP is more likely to offer the LPs co-investment opportunities on their worse deals. The first paper to study this issue was Fang et al. (2015), who found evidence of adverse selection based on data from seven large LPs. However, this finding has been challenged by Braun et al. (2020), who built a large dataset of co-investments and found no evidence that the returns earned, gross of fees, on deals offered for co-investment are significantly different from the remaining deals in a given fund. The growth in the significance of co-investment in LBO deals suggests this is an area that will attract more analysis in the future.

2.1.2 Fund governance

The key document that governs the operation of the Fund is the Limited Partnership Agreement (LPA). This document proscribes the sorts of investments the Fund Manager may enter into, the specific individuals (known as "key persons") who will devote their time to managing the fund, the obligations of the LPs, how much capital will be invested by the GP, and the fees and profits shares to be paid to the GP, etc. We discuss fund economics separately in the next section, but there are several other significant features of LPAs.

First, funds usually have a defined life of 10 years (although some funds with longer and shorter lives have been raised). GPs normally have the option to extend the fund's life for 3 more years, and even further extensions (with the agreement of the LPs) are common. The average life of a buyout fund is, in practice, around 13 years from the initial closing until the sale of the last portfolio firm. LBO funds are self-liquidating vehicles in that when they realize investments in portfolio companies, the proceeds are returned to the investors rather than re-invested in other companies.[h] In addition to defining the fund life, the LPA will also specify the investment period—typically the first 5–6 years of the fund life—during which capital can be drawn down at the discretion of the GP without consulting the LP. After that point, investments are typically limited to those in process, those pursuant to existing commitments, and follow-on investments.

[h]Some recycling of capital into new investments may be possible, depending on the terms of the LPA.

Second, investors commit capital to the fund, but this capital is only "called" when it is required by the GP to complete a transaction or to pay fund expenses. In other words, investors who want to invest a certain amount of money into private equity funds have to "over-commit" more capital to funds than they actually would like to be invested, since <100% of their commitments will be drawn down at any particular point in time. Knowing how much to over-commit is complicated, as the GP controls both when they draw down capital contributions and when the portfolio companies are sold. For this reason, LPs typically use cash-flow modeling to estimate when capital will be drawn down and returned based on historical data from previous funds. Given that funds only call capital when it is required for a particular deal, the way performance is measured takes account of the timing of the actual cash flows. IRRs remain, despite the strong academic health warnings that have been issued (see, e.g., Phalippou (2009)), one of the main performance metrics used by LPs, and, as we explain in the next section, an important component of fund economics.

One recent development, which has a significant impact on the relevance of IRRs, is that GPs of LBO funds are increasingly asking LPs for permission to establish subscription lines of credit. These are short-term loans from financial institutions to the fund. Fig. 1 illustrates the way in which they enable the GPs to pay for transactions without initially calling capital from the LPs. These lines of credit are essentially short-term leverage at the fund level, in that the fund borrows the money to invest in portfolio companies. The commitment of the LPs to send money to the fund whenever it is demanded is the collateral for these loans. Given that most investors in LBO funds are large, reputable investors, and it is very rare for an LP to default on a capital call, such debt is low risk and cheap.

However, there are limits on the length of time that such debt can be used in respect of any investment, which is typically no more than 6–24 months. At one level, the use of subscription credit lines can be convenient for the LP: they should enable the GP to call capital less regularly and more predictably—for example, once a quarter, or annually. On the other hand, the impact of initially borrowing the money to invest in portfolio companies typically will increase IRRs—since the time that LP funds are invested will be shorter. This impacts the economics of the funds, as we shall explain later.

The alternative motivations for the growth of such credit facilities have been analyzed by two recent papers. Schillinger et al. (2020) find that subscription credit lines are mainly a cash-flow management tool and have only moderate effects on final fund performance. In contrast, Albertus and Denes (2020) find substantial distortions in reported IRRs and suggest that subscription credit lines are more common among poorly performing funds. This latter result is, on the face of it, surprising in that such facilities are established at the inception of the fund, and so a GP will not know how well the fund will subsequently perform.

The debate regarding subscription credit lines is yet to be concluded. However, we view this as part of a more general trend toward the increased use of debt in all parts of LBO structures. For example, GPs are often able to borrow the funds they

commit to the fund, using future management fees as collateral. Whether this reduces their effective "skin in the game"—as they do not necessarily need to dip in their own savings to pay for their capital contribution—is debatable, but the practice is not universally welcomed by LPs.

Furthermore, although subscription credit lines are, by construction, short-term in nature, there is a developing trend toward "NAV lines" of credit. These allow funds to potentially borrow money against the asset values of existing portfolio companies, for example, to accelerate distributions or to support portfolio companies late in a fund's life. Essentially, these NAV lines layer leverage at the fund level on top of the leverage that is used to buy the companies in the first place, as we discuss in Section 2.2. There is also an increasing use of "preferred equity" in fund structures, whereby the fund sells a preferred equity stake in the fund, which again can be used to facilitate distributions. These will also have the effect of leveraging the remaining investments, as the first call on returns is the preferred equity. Therefore, while until recently the leverage in LBOs was at the level of the portfolio company, the situation has become significantly more complicated in recent years, and leverage can now be seen at many different points in LBO structures, although the use of such credit facilities and borrowing is by no means universal. We see this as a potentially interesting topic for future research if the relevant data becomes available.

The third important feature of LBO funds is that they are "blind pools" of capital, meaning that once the LPs have made their capital commitments, they have no say on the choice of companies that are acquired. Therefore, during the 5–6 year investment period, the GP essentially controls the LP's checkbook, and also determines when the committed capital is drawn down, the investments are exited, and the proceeds are returned to investors. This structure gives little control to investors once they have made a commitment to the fund. This lack of control can be particularly important in periods of financial crisis or when asset values change dramatically. For example, during the global financial crisis in 2008, the value of most assets fell considerably, which resulted in a "denominator effect" whereby the undrawn commitments (which were fixed in dollar terms) increased the projected share of private equity beyond levels anticipated by some investors. In other words, the nature of private equity investing creates a "commitment risk" that could result in suboptimal asset allocations for investors. Furthermore, in periods of financial crisis, when the premium on liquidity can be high, private equity funds are still able to call capital from investors. This puts them in an unusual and privileged position, but at the expense of their investors who may be required to fund investments at a time when cash flow is scarce.

One response to the lack of control over commitments and distributions has been the development of secondary markets for investor stakes in funds. In such a secondary market, an LP will sell both their investments in the fund and the liability for future draw downs. Typically, the LPA will require LPs to ask for permission to sell their stakes (and future commitments) to the fund, but such permission is usually granted unless something is unattractive about a potential buyer, such as being required to reveal information about the fund (e.g., the returns) and its

portfolio companies to the public. This applies particularly to investors (such as public pension schemes) that are often subject to the various Freedom of Information Acts that apply in the United States, United Kingdom and other countries. Such trading of LP stakes has grown significantly in recent years (see Nadauld et al. (2019)).

Various other secondary markets have emerged, which have significantly increased the choices available to investors. In particular, there is now an active market for purchasing portfolios of companies from the fund. The latter type of transaction is often performed toward the end of the life of a fund, to facilitate a final distribution and winding-up of the fund. The purchaser is often a fund that is raised specifically to invest in secondary stakes. The returns on such secondary funds have been impressive, which has led to a dramatic increase in their capital under management; as of the summer of 2022, Blackstone alone has invested $66 billion in secondary funds.[i]

Another common secondary market transaction is known as a "continuation fund." These funds acquire one or more of the remaining portfolio companies from the existing fund and give LPs the choice of rolling over all, or a part of, their investment into the continuation vehicle. Clearly, such transactions are sensitive for at least three reasons. First, the GP is managing both the fund that is selling the asset, and the vehicle that is buying the asset. Being on both sides of a transaction is a recipe for conflicts of interest. Too low a price benefits the shareholders of the continuation fund at the expense of the shareholders of the original fund. And too high a price will lead to a higher IRR for the original fund, which can be advantageous to the GP since it will allow him to raise larger funds in the future (see Chung et al. (2012)). In addition, the fees on continuation fund vehicles are subject to considerable debate with LPs, as GPs are able to "write up" the value of the companies as the basis for charging management fees, and enable the GP to expand the assets they manage, since these vehicles are additional to their normal sequence of funds.

However, there is also a logic behind these deals: for some companies, where the GP anticipates that significant incremental growth can be achieved, the use of continuation vehicles can make sense for LPs, as they can share in the portfolio companies' upside for a longer period. In a sense, the popularity of continuation funds points out a weakness of existing 10-year fund structures. It seems likely that the alternative approach of lengthening the fund life and holding the assets within the fund for longer will also become more prevalent in the future.

Such innovations have significantly increased the liquidity of private equity investments in recent years, although many of the investors in such funds (such as pension funds and sovereign wealth funds) have little need for liquidity.[j]

[i]This value was taken from the Blackstone website in July 2022: https://www.blackstone.com/our-businesses/strategic-partners/

[j]See Nadauld et al. (2019) and Boyer et al. (2021) for more information about these secondary markets.

2.1.3 Fund economics

Buyout funds receive three potential sources of revenue: management fees, carried interest payments and, in some cases, fees from portfolio companies. As we explain, management fees and portfolio company fees are related, and so we discuss these first, before turning to carried interest.

Management fees for LBO funds have traditionally been around 2% per annum (initially of commitments, and eventually of invested capital)—and form part of the characterization of private equity as having a "2 and 20" cost to investors. A recent analysis by Lim (2022) of around 6000 LBO funds finds remarkably little variation in such fees: the median fee remains 2% with the mean only slightly lower at 1.9%, and a standard deviation of 0.2. Given the huge growth in the size of LBOs, and the economies of scale that exist, it is remarkable how little fees have fallen. For instance, Lim finds that the median fee for funds that are in the top quartile by size in each vintage year is still 1.8%. The sheer scale of such fees for multi-billion dollar funds has meant that the original mantra of private equity (management fees keep the lights on, but we only get rich on carried interest) simply does not hold anymore for large buyout managers. In Fig. 1, the management fee is illustrated as flowing directly from each Fund to the Fund Manager, but in practice this would often flow into the GP and then out to the Fund Manager, and, if profits remain, to the UMC.

It should be noted that this headline fee is normally charged for the investment period on committed capital, rather than invested capital. Therefore, for the first few years of the fund the management fees can be a considerable drag on returns—which almost inevitably go negative initially—and a very large proportion of the net asset value of the fund in the early years. Initial investments take time to be re-valued and management fees, charged based on the entire committed capital, have an immediate negative effect on returns. Indeed, this phenomenon has been given a name—the J-curve—and has been the subject of books written on the details of private equity investing (see, for example, *J-Curve Exposure* by Mathonet and Meyer (2007)).

However, it is important to realize that the management fee is typically reduced after the investment period. According to a recent survey (Hudson (2020)), such "management fee step-downs" after the investment period are observed in 95% of funds. Management fees can decrease after the investment period in a variety of ways. First, the management fee rate could be reduced, but still calculated based on the entire committed capital, including money that has already been drawn down, invested, exited and returned to investors by this point. Second, the management fee could remain the same in percentage terms, but the fee basis can be reduced to the capital that is still invested, usually calculated as the book value of the initial investment net of the cost of any realized investments. Finally, some LPAs specify both that percentage management fees are reduced and that the fee basis is changed to invested capital. However, such a dual approach is less commonly observed in practice, other than in some large buyout funds.

In the first study of the economics of private equity funds, Metrick and Yasuda (2010) found that, on an *ex-ante* basis, management fees comprised around two-thirds of GPs' expected revenues. Lim (2022) focuses on realized returns and finds a somewhat lower proportion—just over 50%—of actual revenues for buyout GPs comes from management fees. However, this is still a high proportion, and for large funds, such revenues will amount to much more than the costs of running the fund. The existence of significant, predictable profits from multiple funds is one of the driving forces of the sale of stakes in the ultimate management companies.

In addition to the management fees that are charged directly to the LPs, in some LBO funds, fees can also be charged by the GP to portfolio companies. Such fees are associated with services such as on-going monitoring, arranging transactions, etc. Some of these fees are questionable: surely on-going monitoring of investment is a service that should be covered by the management fee? However, other services provided by the GP substitute for those that might otherwise need to be provided by a third party. For example, a GP might provide corporate finance advice related to debt restructurings or acquisitions, for which the portfolio company would otherwise pay fees to an investment banker. An interesting discussion of such arrangements and the questions they raise about governance is provided by Phalippou et al. (2018).

However, where such fees are charged, they are often partially or fully offset against the management fees charged to LPs. In recent years, 100% offsets have become common, meaning that any revenues associated with a set of services, as specified in the LPA, are offset in a given year against management fees. The devil is in the detail, since some services are carved out from the 100% offset and can result in additional revenues flowing to the GP. One might ask why such portfolio company fees are charged at all, if they are subsequently netted off against management fees. Aside from the potential additional revenues for the GP from services not covered by the offset, the main reason for the arrangement is often tax related. For example, in the United Kingdom, GPs have to charge value-added taxes on management fees, which cannot normally be reclaimed by the LP. In contrast, the taxes on any services charged to the portfolio company can normally be offset. While it is clear from an economic perspective that management fees are no lower whether they are paid by the LP or the portfolio company, this can add complexity to tracking the cost of private equity investments. Furthermore, in the case of co-investment vehicles, there are often no fees to waive, and therefore investors in such vehicles will not be indifferent to the level of portfolio company fees charged.

The final component of GP remuneration is a "carried interest" in the fund, usually equal to 20% of a fund's net profits. In contrast to management fees, either charged to the LP or the portfolio company, which do not depend on the performance of the investments, carried interest is a direct function of a fund's performance. Unlike venture capital funds, carried interest for most LBO funds is only paid after a "preferred return" has been earned by the LPs. This is defined in terms of an IRR, which is referred to as the *hurdle rate*. The most commonly observed hurdle is 8%.

In the sample of LBO funds studied by Lim (2022) 85% had precisely an 8% hurdle, 2.4% had a hurdle between 8% and 10%, and 5% between 6% and 8%. The remainder had no hurdle rate. Once the preferred return has been achieved, GPs share the profits through their carried interest. This carried interest proportion is almost always 20%: in Lim's sample, 95.8% of GPs had precisely a 20% carried interest, with 1.5% having a lower share and only 2.8% having a higher share.

From an economic perspective, this clustering of carried interest, and preferred returns, is surprising: one would expect the successful GPs to appropriate a higher share of the profits over time. However, the gains to success seem to accrue largely through growing the fund size while keeping the management fee constant. A notable feature is that the hurdle must be cleared before carried interest is earned, but it is a "disappearing" rather than a "hard" hurdle. A hard hurdle would stipulate that the GP would only share in profits *in excess of* the preferred return. However, in the case of LBO funds, once the LPs have received their preferred return, the LPA will stipulate a catch-up rate whereby the GPs receive more, or often all, of the next available cash until the overall profits are shared 80/20. For this reason, the hurdle rate is only of significance for funds that perform relatively poorly, or in adverse market conditions: if a fund returns, say, a 15% IRR, the extent of carried interest payments will be the same whether or not the fund had a hurdle rate (as long as the hurdle rate was sufficiently below 15%, of course). Therefore, when some successful GPs have managed to negotiate away the preferred return in subsequent funds, this results in the strange outcome that future payments will only be higher if future fund performance is low. Removing hurdles hardly contributes to an alignment of interest, as GPs continue to earn performance fees even when profits are low.

There are some important details about the way carried interest is calculated, in particular relating to the cashflow "waterfall." While the overall size of carried interest payments is based upon the performance of the fund as a whole, there can be important differences in the timing of such payments. There are two main approaches, which are known as "American waterfalls" and "European waterfalls." An American waterfall tracks capital contributions (and an allocable portion of funded expenses) and distributions from realized investments. Furthermore, carried interest begins to be distributed as soon as the IRR on such investments exceeds the hurdle. For instance, if a $500 m fund has called $100 m, and quickly returns $300 m (and so comfortably exceeds any normal hurdle rate), the GP would receive 20% of the profit to date, i.e., $40 m (20% of the $200 m profit). Of course, the remaining $400 of capital has yet to be invested, and the fate of these remaining investments will determine the ultimate carried interest payment. For instance, if that $400 m was invested for a loss, and resulted in distributions of only $300 m, the overall fund would only yield a profit of $100 m. Providing the IRR still exceeded the hurdle rate—which is likely given the way IRRs are calculated given the impact of early distributions—a provision in almost all LPAs known as a "clawback" would require $20 m of the carried interest assigned to the GP to be returned to the LPs. However, if these sums had already been paid out to the GPs they would have paid taxes on the sums received, and LPAs normally stipulate that any clawback is capped at the net after-tax carried interest received.

Given the obvious issues relating to paying out profits on early investments before all the capital has been invested, many funds now use an approach commonly referred to as a European waterfall. Under a European waterfall, carried interest is not paid until the fund has returned all the capital contributions, including those for management fees paid by investors, and the preferred return. Therefore, carried interest payments under a European waterfall typically occur much later in the fund life. The LPs will receive cash earlier under a European waterfall than in an American waterfall, so this should result in higher IRRs to LPs, holding cash flows constant and ignoring tax considerations. One of the few academic papers to focus on these differences in the timing of cashflows is Hüther et al. (2020), using evidence from venture capital contracts, which use similar waterfalls. Intriguingly, they find that funds that use the more "GP-friendly" American waterfall tend to have higher returns. This result could occur because of selection—higher quality funds are able to negotiate with their LPs to use an American waterfall, which enable GPs to receive their carry sooner.

One important question remains about carried interest: which individuals in the GP receive it? From the investors' perspective, carried interest is an important way in which their interests are aligned with those of the fund managers, but this assumes that the people putting in the effort to find attractive targets for acquisition and making the decisions are personally receiving a reasonable share of any profit sharing. This issue has two important considerations.

First, the increasing tendency for the UMC to be listed publicly (for instance, KKR, Blackstone, Apollo, etc.) means that a proportion of the economics of each fund will flow to the shareholders of the listed entity, rather than to the current LBO fund managers. Furthermore, even if the UMC is not itself listed, it has become increasingly common, as noted earlier, for stakes to be sold to specialist funds or even to large LPs (such as US public pension schemes or sovereign wealth funds). In both cases, some incentive effects of the carried interest on those doing the deals will be reduced. Some investors have used this dilution of the alignment of interest as a screen to determine which funds to consider.

Second, even if none of the carried interest has been "sold" to outside investors, the distribution of the carry between those working for the fund and the UMC can vary widely. For instance, the founders of the UMC may no longer be involved on a day-to-day basis with the running of the latest funds but may still take a significant share of the carried interest. In many respects, this practice is reasonable: the founders took risks and invested capital and labor in establishing the initial funds, and later funds "stand on the shoulders" of the earlier funds' reputations. However, founders continuing to take a share of the carry after their active involvement in investments has ended has the same dilutive effect on incentives as selling a stake in the UMC.

In both cases, the underlying issue is the way in which funds manage succession. How founders cash out, if at all, is a common issue across professional service firm partnerships. This issue is likely to become an important topic of research as more LBO (and other) partnerships face such succession issues. However, information on the distribution of carried interest is particularly difficult to obtain, at least for

academic researchers. Since LPs increasingly ask questions about this as part of their fund due diligence, it will hopefully only be a matter of time before data on the distribution of fund economics becomes widely available. To date, the only paper that has looked in detail at this issue is Ivashina and Lerner (2019). These authors examine 717 private equity partnerships and find that the allocation of carried interest is divorced from past success as an investor. However, the allocation is heavily influenced by whether an individual is a founder, and that a lack of carried interest to the currently active partners results in departures and the spawning of new partnerships.

The overall effect of carried interest and management fees is to drive a considerable wedge between gross returns earned by the fund and net returns received by the LPs. Clearly, the magnitude of this wedge will depend on the performance of the fund, but, on average, the difference between gross and net LBO fund IRRs tends to be around six percentage points.

2.1.4 Taxation

As noted at the start of this section, one of the over-arching reasons why partnership structures are employed for LBO funds is taxation: both for the GP and LP. From the perspective of the LP, aside from ensuring limited liability for LPs, such fund structures are "tax transparent," meaning that no taxation is levied at the fund level. This is important, since many investors in private equity funds are tax exempt, and so will pay no taxes on the capital gains or income they receive. The limited partnership structure enables investors to benefit from the same tax treatment they would receive if they owned private companies directly, but with the additional advantage of limited liability.

From the perspective of the GP, there is in most countries a substantial benefit from the partnership structure: carried interest is typically taxed at capital gains tax rates rather than income tax rates. In most countries, the effective rate of taxation of capital gains is (often considerably) lower than that applying to income. This difference can occur simply from lower rates of taxation since any profits earned by the portfolio company will have been subject to corporate taxation. However, in the case of LBOs, the extensive use of debt can significantly reduce, or eliminate entirely, corporate taxes. The lower effective rate can also derive from any "tapering" of capital gains tax rates depending on how long assets are held for. In many countries, policymakers have attempted to reduce taxes on entrepreneurs and long-term investors by having a reducing rate of capital gains tax depending on the length of time an asset is held. Given that portfolio companies are often held for several years, those in receipt of carried interest payments may also be able to benefit from such "taper relief."

Maximizing capital gains tax treatment can take other forms as well, including various ways in which management fees can be turned into carried interest payments. The carried interest itself can be vested into offshore vehicles (or, in the United States, tax-sheltered accounts such as Roth IRAs) that can delay the payment of capital gains taxes, in some cases indefinitely. These arrangements are complex

and the extent to which they are available to GPs varies across jurisdictions, but the tax advantages are perhaps the main reason why partnership structures have emerged as the dominant way of organizing buyout, and other private capital, funds.

It is not surprising, therefore, that taxation of carried interest has been one of the most contentious issues facing the private equity industry, with newly elected political leaders around the world pledging to change the tax treatment. However, changing the tax treatment of carried interest is easier said than done, as witnessed by the inability of recent US presidents, like Obama or Trump, to follow through on their desired reforms. The difficulty of changing the tax treatment of private equity occurs because the individuals who benefit from carried interest do invest capital to receive their share of the proceeds of any investment. Therefore, in this fundamental sense, what investors receive as carried interest really is a capital gain. While, in economic terms, this gain comes from the partners' labor in their nurturing of the investments—and so is more akin to a bonus for good performance—most countries have found it difficult to write rules to tax carried interest as labor income.

2.1.5 Regulation

In this section, we have been discussing the relationship between the LP and GP, and the extent to which alignment of interest is achieved. Given that most LBO funds are only accessible (at least directly, rather than through fund-of-fund structures) by institutional investors, much of the regulation of the fund itself tends to be through private contracts, that is, the limited partnership agreement. However, fund managers are, in general, regulated by national regulators. This has not always been the case. For example, US fund managers were often able to avoid regulation under the Investment Advisors Act of 1940, on the basis that they had few, large clients. However, the Dodd-Frank (Wall Street Reform and Consumer Protection) Act that became law in 2010 swept away these exemptions, and any fund advisor managing more than $150m in assets became regulated by the Securities and Exchange Commission (SEC). The SEC started regular examinations of LBO fund managers, including whether the GP stuck to the terms of the limited partnership agreement, and concluded that around one-third of such agreements were being violated in practice, though the materiality of such violations seems to have varied greatly. This led to some high-profile settlements by the GPs, although often without admitting that violations had, in fact, occurred.

Regulation has also become more extensive in Europe. The most significant piece of recent legislation has been the adoption within the European Union of the Alternative Investment Fund Manager Directive (AIFMD), which became effective in July 2013. Under the AIFMD, any manager of an "alternative investment fund" (as opposed to entities such as mutual funds, which are subject to the separate Undertakings for Collective Investments in Transferable Securities, UCITS) must be registered with, and are subject to regulation by, their national regulators. As with the Dodd-Frank Act, the AIFMD was passed in the wake of the financial crisis of

2008, amid fears that alternative assets might lead to systemic risks. It covered not only LBO funds, where it is hard to see any potential for systemic risks, as well as hedge funds, where such risks clearly exist.

The trend toward increased regulation of LBO funds is inevitable as the proportion of assets—many of them in high-profile and, in some cases, politically sensitive companies—increases. This has, in general, resulted in even more complexity in the structure outlined in Fig. 1. For example, in order to obtain a European passport for marketing funds throughout the EU, it is necessary to have a regulated fund manager within the EU.

2.2 Funds and portfolio companies

Having discussed the relationship between funds and their investors, we now turn to the way in which LBO funds structure their acquisitions of portfolio companies. A key distinguishing feature of LBOs, in contrast to venture capital or expansion capital deals, is that they normally acquire relatively mature companies that have regular cash flows. This cash flow is critical to support the leverage that is a defining feature of LBOs. In this section, we first describe LBOs' capital structures and how the sources of debt have changed significantly over time.

2.2.1 LBO deal structures

In an LBO, the fund contributes the equity (alongside any co-investment vehicles) that is used to purchase portfolio companies, and this equity is supplemented with significant amounts of debt. Since most LBOs are "control deals" in which a majority of, if not all, the equity is purchased, the fund normally borrows against the assets it intends to acquire. This is clearly not possible in the case of minority investments—for instance in venture capital deals—since the majority owners (e.g., the entrepreneurs) would not accept debt, secured against their own venture, as a means of payment! The fund itself does not take on debt, although in the short-term the equity contributions from LPs may be debt-financed using subscription credit lines, as discussed in the previous section.

Since many transactions are competitive, with investment banks running an auction involving interested potential acquirers, it is necessary for all bidding buyout funds to obtain commitment letters from debt providers (who typically charge a fee for this service). The most relevant metric for the debt providers is the stability and predictability of the future cash-flows that will be generated by the portfolio company, which will be used to pay the interest on the debt. In particular, in LBO transactions, there is a focus on earnings before interest, tax, depreciation, and amortization (EBITDA), which gives a measure of the available cash that could (at least in the short-term) be used to pay interest. Since EBITDA makes no allowance for capital expenditures, an alternative variant that is frequently used is EBITDA minus "normalized" CapEx.

The capital structure used in U.S. LBO transactions can be seen in the chart below. There has been a noticeable upward trend in LBO valuations, in terms of

EBITDA multiples, although valuations fell in 2009 following the global financial crisis. The near-zero interest rates on government debt through the 2010s have reduced the cost of debt and are likely to have been a major cause of the increase in valuations in this period. The most recent data, for 2019 and 2020, suggests that valuation multiples have continued to increase slightly, reaching an average of 11.4 × for 2020.[k] European LBOs have followed a similar trend.

Total debt as a proportion of purchase prices (i.e., enterprise values) hit a peak before the financial crisis at around 60%. The majority of debt in LBOs is in the form of senior secured, or "first lien" debt—as shown in Fig. 2. Such debt was traditionally supplied by banks, and, given the unusually leveraged structure of the portfolio companies, is often referred to by the somewhat unusual term "leveraged loan." These loans are arranged by a lead bank and are then usually syndicated to other banks and lenders. Many of these "syndicated loans" ended up in collateralized loan obligation (CLO) funds and were one example of banks becoming focused on generating fees (commitment fees, arranging fees, etc.) using their balance sheet capacity, but not holding onto the loans themselves. This approach is known as the "originate and distribute" business model. Were such debt to be rated by credit rating agencies, which in general it is not, it would often be classified as sub-investment grade. However, by bundling together loans from many different companies and then slicing them into tranches of varying seniority, CLOs can create securities that have high investment grade ratings (along with junior tranches that are much riskier).

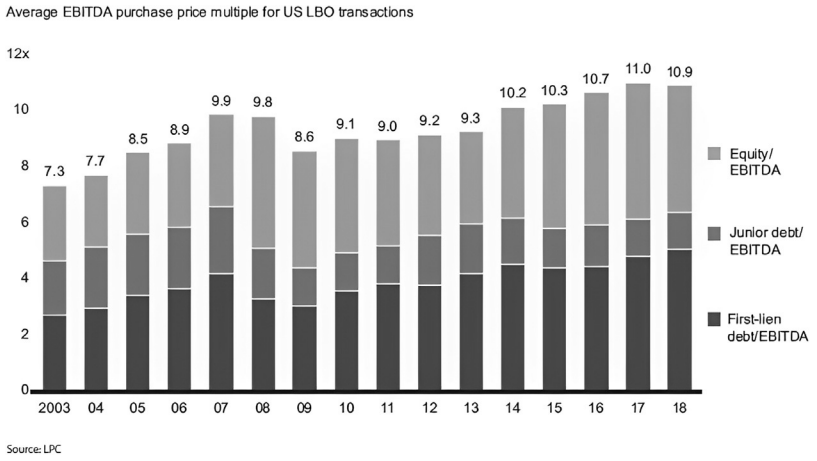


FIG. 2

Valuations and capital structure of LBOs.

[k]See fig. 8 in the 2021 Global Private Equity Report published by Bain, available at https://www.bain.com/globalassets/noindex/2021/bain_report_2021-global-private-equity-report.pdf

In addition to the senior secured debt, it is common for LBOs to raise additional, subordinated debt, sometimes referred to as "junior" or "second lien" debt. Traditionally, such debt was often provided by specialist investors, including hedge funds. As the name implies, such subordinated debt often has a longer maturity than the senior debt—so the latter is paid off first—and has lower priority than the senior debt in the event of bankruptcy or liquidation. There can be multiple tranches of subordinated debt, including mezzanine debt, which will often be the riskiest. Mezzanine debt sometimes includes equity-like features such as warrants—and hence is considered to be at the mezzanine level between debt and equity.

2.2.2 An example of an LBO deal structure

To give an example of the structure of lending used in a typical LBO, in Fig. 3, we illustrate the capital structure of the 2006 LBO of Kwik-Fit, which is a tire and exhaust system repairer based in the United Kingdom, by PAI Europe IV fund.[1] This deal had a typical pre-financial crisis structure. The purchase price of £773.5 m equals a multiple of 8.1× EBITDA. This enterprise value includes any existing debt, which would have to be repaid on such a change of control. The financing of the acquisition comprised 25% equity (from the fund, with some contributions from management) and 75% debt (from banks and other providers).

The debt was structured into five tranches, along with two credit facilities. Starting with the latter, such credit facilities are established to minimize cash

	Amount (£m)	Terms	Pricing (spread over LIBOR)	Multiple of EBITDA
Enterprise Value	**773.5**			**8.1 x**
Equity	**191.0 (25%)**			**2.0 x**
Debt				
Term Loan A	140	7 year amortizing	2.25%	
Term Loan B	135	8 year bullet	2.50%	
Term Loan C	135	9 year bullet	3.00%	
2nd Lien	75	9.5 year	5.00%	
Total senior secured debt	*485.0*			*5.1 x*
Mezzanine	97.5	10 year	4.5% + 5% PIK	
Total Debt	**582.5 (75%)**			**6.1 x**
Revolving credit facility	40	7 year	2.25%	
Capex facility	50	7 year	2.25%	

FIG. 3

A typical pre-GFC capital structure: Kwik Fit, 2006.

[1]This example is taken from Axelson et al. (2013).

holdings necessary for covering normal operational needs, and thereby maximizing net debt. In general, facilities are not normally included in the calculation of debt, as they are undrawn at the time of the transaction, and the banks that provide such facilities normally require that they are reduced to zero at regular intervals (to distinguish such facilities from term loans). The loans themselves were structured with three tranches of 1st lien debt, that is, the Term Loans A, B and C. These rank pari passu in seniority, but the A loan is less risky because it is repaid earlier, being amortizing, and has a shorter (7 year) maturity than the B and C loans. An important feature of LBOs is the length of such term loans: 7–9 years is quite typical, which is much longer than the maturity of most public company debt. Having long maturity debt reduces refinancing risk, which, in the case of Kwik Fit, would have been a major benefit when the financial crisis hit 2 years after the LBO.

Another important feature of LBO debt is that much of it is non-amortizing, with the principal being repaid at the end of the term in a "bullet" payment. This is the case in this example, with the B and C tranches being bullet loans and the C having a 1 year longer term than the B loan. Such bullet loans reduce the ongoing cash flows to the lender, which are limited to interest payments, and can thereby increase the quantity of debt that is used for the LBO. Given the higher risks—both associated with the structural (if not legal) subordination of the tranches, and the differing amortization schedules—the B and C loans have slightly higher margins than the A loans.

When no regular repayments of the principal are required, lenders may negotiate a "cash sweep" whereby some proportion of available cash flow each year is used to repay the principal amount. In effect, this makes the amortization schedule contingent on firm performance, and so reduces the risk of default, at least in the short-term.

In the Kwik Fit deal an additional tranche of 2nd Lien debt was raised. This 2nd Lien debt ranks below the A, B and C Term Loans in terms of seniority, but is still classified as part of "senior secured debt." Relative to the C term loan, the 2nd lien debt has a slightly longer maturity, and pays an interest margin that is noticeably higher at 5%. This reflects the market's perception of how the debt is becoming significantly riskier as leverage is being stacked up. However, the private equity sponsors chose to increase leverage even further using a mezzanine loan. This again had a slightly longer maturity than the 2nd lien debt and required the firm to pay a margin of 4.5% (over LIBOR) interest in cash, with additional interest—known as pay-in-kind, or PIK—being rolled up and added to the principal amount outstanding. The total cost of this riskiest tranche of debt is clearly significant—with a total margin over LIBOR of 9.5%—and such rates reflect risks that are arguably closer to equity. In a sense, the private equity sponsor is therefore deciding on the size of its exposure to the deal (as it could have contributed more equity in place of the mezzanine loan) and the riskiness of its investment.

2.2.3 The growth of private debt

Traditionally, the main providers of leverage for LBOs were banks and some specialist lenders such as mezzanine funds. However, in recent years the provision of debt to fund LBOs has changed significantly with the emergence of private debt funds.

Private debt funds are structured in a similar way to private equity funds, raising money from institutional investors as an LP–GP structure, with a finite life and charging a management fee (often around 1%, but charged on invested rather than committed capital) and a carried interest on the profits. Such funds grew quickly after the 2008 financial crisis as some of the banks that were major players in the leveraged loan market reduced the extent of such lending (for instance, RBS, which was the dominant lender to LBOs in Europe, effectively withdrew completely from the market). As banks faced increasing capital requirements, including for leveraged lending, private debt funds moved into the vacuum and grew rapidly. Institutional investors, facing near-zero yields on their fixed income investments, were attracted to these funds, which provided a diversified portfolio of loans that were actively managed over the life of the fund (unlike many of the bank-originated loans that were sold into CLOs).

Private debt funds lend to most types of companies, including publicly listed and private companies. However, a significant proportion of private debt has been used to fund LBOs. As private debt funds have moved into the space left by banks, there have been some innovations. In particular, private debt funds are often prepared to provide both the senior and junior debt—which has become known as uni-tranche lending—which can make it easier and quicker for buyout funds when arranging the debt for an LBO transaction, as they only have to deal with one potential lender. This is increasingly the case since private debt funds have grown significantly in scale, with market leaders such as Oaktree, Ares and GSO raising multi-billion dollar funds. Research on the lending practices and the risk and returns of private debt funds is currently limited, in part because the number of funds that have matured and where outcome returns for investors can be observed are still relatively few. One of the few studies to date is Munday et al. (2018) which provides early evidence of the performance of the various types of private credit strategies, with the best returns being associated with direct lending. Private debt funds are likely to be an important topic for research in future years.

2.3 Portfolio companies and management

Having explained the relationship and alignment of interest between investors and funds, and the financial structure used by funds to finance their acquisition of portfolio companies, we now turn to the way that LBO funds provide incentives to the management team of the portfolio companies. As with information about the distribution of carried interest within a fund, there is relatively little information in the public domain regarding the incentives given to management teams of portfolio companies. However, some general observations are possible.

First, the existing management team, prior to the LBO, often does not survive the acquisition. One of the ways in which private equity owners can add value is by improving management, and in many cases, this means replacing the existing CEO and/or other senior officers. However, the arrival of an LBO owner does not always lead to a management change. In many cases, the fast pace of decision-making

(driven by the buy-to-sell model and focus on metrics such as IRRs), an increased focus on data, driving out inefficiencies, and the other improvements brought by the LBO can be empowering and motivating for management. But for others who are used to less active owners and not excited by the strategic plans of the buyout fund, the arrival of private equity owners can lead to their exit.

Second, many LBO funds now retain a roster of industry experts with operational experience who are closely involved in the due diligence stage of a potential transaction and are involved in the on-going leadership and/or improvement projects of the portfolio company. Such executives are often called "operating partners" of the LBO fund, and they will tend to focus on particular sectors (such as retail, hospitality, or industrial) where experience can be particularly valuable. If the LBO fund wins the deal, such operating partners can be installed as Chair of the portfolio company to provide a direct link with the fund on a day-to-day basis. Such operating partners will usually be paid by the portfolio companies during their period of involvement, or fees for their services may be charged by the fund to the company. Equity incentives can be provided at the portfolio company level, which can reduce the share of the carried interest on the fund required for such operating partners. In a sense, their incentives become more "deal-by-deal."

Third, whether or not the management team remains the same, a defining feature of LBOs is the increased use of leverage, which reduces free cash flow and acts as a disciplining effect on management, as originally noted by Jensen (1986). Many LBO targets operate with very low leverage and enjoy the stability of owning assets (specifically property) rather than having to make contractual payments (such as rents). As noted in the previous section, LBOs are conducted by the fund arranging significant amounts of debt financing to acquire the company, and the debt is then pushed down into the portfolio company. Having gained control of the company, there will often be subsequent balance sheet transactions, such as selling off property. The proceeds of such sales can be used to reduce leverage or to make special dividend payments to the fund, which can have a substantial effect on IRRs. In virtually all LBO transactions, however, the management must operate with far less financial flexibility because of much higher leverage.

The final aspect of the management contract that is critical to the LBO model is equity incentives. The typical transaction involves significant equity stakes being bought by the executive team, so that the alignment of interest flows from the investors to the fund (via carried interest) to the portfolio company (via equity stakes). These equity stakes are leveraged by the debt taken on by the portfolio company. However, they are leveraged further by the structuring of the equity. An example of a typical structure is presented in Fig. 4.

In this example, a portfolio company is bought for $1000 m, with $300 m of equity and $700 m of debt. The debt is structured as $400 m of senior debt, which we assume amortizes over time, and $300 m of junior debt (with a bullet payment at maturity). To align interests, LBO funds almost always insist that management owns a significant stake in the firm's equity. However, since the equity in the deal comprises $300 m, a 10–20% stake in the deal would cost $30–60 m, which could be

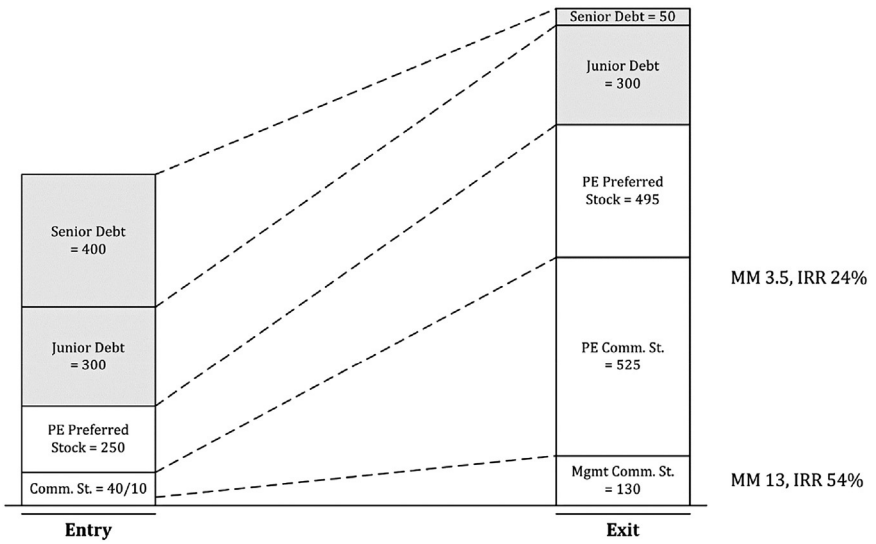


FIG. 4

The structuring of debt and equity in LBOs.

beyond the net worth of a typical management team. Consequently, at the time of the transaction, the equity may itself be split into tranches, with the majority being preferred stock, which earns a fixed rate of return, and the remaining being the common stock. In the example, we assume that $250 m of the equity is provided by the fund in the form of preferred stock, along with a $40 m investment in the common stock. The remaining $10 m is invested by the management team, who, in this example own 20% of the common stock (but none of the preferred stock). Given that the preferred stock has a fixed rate of return, in this example 12%, from the perspective of the management team the preferred stock adds additional leverage and risk to their equity in addition to the debt.

Evidence on the structuring of the equity in LBOs is sparse, particularly for US deals where private companies are not required to publish their accounts. The way in which deals are structured can differ, depending in part on the tax treatment of preferred shares, with a common alternative being the use of a shareholder loan (at a fixed rate of interest) being provided by the fund in place of the preferred shares. Either way, the intention is to give the management team significant "skin in the game" via very highly leveraged equity stakes.

The example in Fig. 4 demonstrates how significant the gains for management can be. We assume that exit occurs after 6 years, and that the total enterprise value has increased by 50% to $1500 m. Given the typical duration of amortizing senior debt, most of that would have been repaid after 6 years—we assume a balance of 50 remains. The junior bullet payment debt is still outstanding. The preferred stock, with a 12% interest rate, will have increased to $495 m, providing the LBO fund close

to a 2× return on that part of the original investment. The remaining value—in this case $655 m—accrues to the common stockholders. Assuming the fund invested $40 m in the common stock, this turns into $525 m. Combining their holdings of preferred stock and common stock, the LBO fund makes a 3.5× return on its investment. Recall that the increase in the enterprise value is only 50%, demonstrating the impact of debt on amplifying equity returns (and, of course, risk).

From the perspective of the management team the returns are spectacular: their original $10 m investment turns into $130 m over the 6-year period. Such "life-changing" potential returns are precisely what LBO funds seek to offer management teams, who have by far the sharpest incentives. This can be seen not only on the upside, their 13× return on investment, but also on the downside. Had the company not performed as planned, and the enterprise value had fallen, relative to the entry price, by 10% or more, then the management team's equity stake would be worthless, with all remaining value accruing to the PE fund via their preferred stock.

Therefore, the management team in a typical LBO structure is highly incentivized to produce financial returns and to exit the investments relatively quickly, since they will not realize the value of their equity until a purchaser is found. For those with the appropriate risk appetite, working as an executive in an LBO can be one of the most attractive roles in the corporate world. Extraordinary potential rewards are combined with highly engaged owners who are focused on rapid value creation, with much less of the scrutiny—from the press or analysts—that executives of public companies attract. If a large payout occurs, it is seldom a matter of public record, as the details of the capital structure are usually hidden from public scrutiny. There are no shareholder votes on remuneration, and no reporting of bonuses—these are all matters decided privately with the fund. Indeed, over time a cadre of serial LBO executives has emerged who move from one transaction to the next, often with a gap to draw breath between deals, and who develop close relationships with particular (or even multiple) LBO funds. Such trusted executives are an important, and richly rewarded, part of the LBO ecosystem.

It seems likely that a significant part of the success of LBO funds in creating value derives from being able to attract very talented management, who are highly incentivized to produce financial returns in collaboration with the fund. It is, of course, difficult to isolate the impact of management when the counterfactual is difficult to observe. This is another area that is ripe for future research, for instance, analyzing whether investment plans and execution were successfully achieved, or whether good (or bad) outcomes were more attributable to luck (or lack thereof). As individual executives undertake serial engagements over time, it may be possible to test for the existence of individual skill (e.g., by testing for individual fixed effects) in the same way as has been done for CEOs of public companies. However, as with many issues involving private equity, data is often the issue. At present, while deal-level returns data are becoming available (see, e.g., Braun et al. (2017)), details of management compensation contracts remain largely hidden.

In conclusion, this section has described the manner in which capital is provided to funds, how funds acquire companies, and how those companies attract and

incentivize management. The mantra of private equity has always been alignment of interest, and the arrangements we have documented explain how this is achieved. However, in the case of LBO funds, competition for capital and deals have resulted in significant increases in fund size and, as we shall show, a noticeable reduction in returns, certainly relative to public markets. For large LBO funds, alignment of interest has, in our view, declined over time. This is chiefly because management fees have not reduced as fund sizes have increased, despite the obvious economies of scale. The fund managers and owners of the management company "brand" can earn handsome returns even if investors are disappointed. Some LBO funds have responded to excess demand from investors by removing hurdle rates, the only impact of which is to pay carried interest to the fund even when returns are low. From an economic perspective, one might expect successful GPs to increase the carry percentage and for management fees to be more cost-based, but in practice carry percentages only rarely deviate from the standard 20%.

In this respect, LBO funds differ noticeably from VC funds. There are many VC GPs where they choose to limit fund size growth, charge fees that are broadly in line with costs, and, if successful, charge higher carried interest. Whether LPs eventually drive some change in their negotiations with LBO GPs remains to be seen; there were signs of change after the global financial crisis in 2008, such as the development of best practice limited partnership agreements by the Institutional Limited Partners Association (which have been revised regularly and are, at the time of this writing, in version 3.0). However, since then, investor allocations have been increasing significantly to private equity—both LBOs and VC—and consequently GPs have been able to defend the status quo. However, ultimately this status quo will only be sustainable if net returns to investors, on a risk-adjusted basis, remain attractive to investors.

3 How do buyouts create returns for their investors?

Understanding the way buyouts are structured, however, does not address the more fundamental issues of why they occur at all and why they have become so prevalent in recent years. Buyout sponsors earn returns for their investors by making profits on the purchase and sale of their portfolio companies, sometimes receiving dividends during the period in which they own the companies. A buyout fund will seek to acquire a company if the expected return its GPs anticipate from their period of ownership exceeds their cost of capital.

This cost of capital, however, is a relatively high target. To invest in a buyout fund, a potential investor must anticipate that the fund will earn high enough returns to compensate for the fund's fees, its risk, and its illiquidity. As noted in the previous section, the "2 and 20" fee structure drives a significant wedge between gross and net returns. Furthermore, the leverage of their portfolio firms results in buyout funds having relatively high equity betas, even though buyout funds often target relatively non-cyclical businesses with lower asset betas. Consequently, the systematic risk of

buyout funds and hence the required rate of return they demand for their investments is likely to be higher than that for publicly traded companies. We discuss the issues involved in estimating fund betas and returns in detail in Section 5.

The impact of illiquidity on required returns is harder to quantify but undoubtedly meaningful. Buyout funds require investors to make capital commitments for very long periods of time. Most funds have a 10-year life, and, with extensions, it is typically at least 12 years before a fund exits all its investments. Although opportunities to sell stakes in a fund before its investments are exited have increased over time, these remain limited and may incur significant costs.[m] Investors in a buyout fund have no say in the decisions about the timing of the fund's return of capital. Rational investors should only become limited partners in a buyout fund when they feel that the fund's returns, *net of the fees the fund charges*, are likely to exceed those of the public market by enough to offset the fund's risk and illiquidity.

For these reasons, the most natural investors into buyout funds are those for whom illiquidity is less important. Examples of such investors are those investing for the very long-term, such as sovereign wealth funds, endowments, pension funds (especially those which are growing, with contributions exceeding withdrawals), etc. that have relatively low liquidity demands. In such cases, the required liquidity premium may be very modest. However, for other investors, the unpredictable nature of capital calls and distributions means that access to adequate, as Swensen (2009) calls "non-disruptive sources of liquidity," such as credit lines, are critical to minimize liquidity risks.

3.1 Improving portfolio firms' values

How does a buyout fund go about earning these high returns? Part of the game is buying companies for less than their underlying value. Sometimes buyout funds can find proprietary deals and can purchase a target company without competition from other funds. These deals tend to be purchased at lower prices than comparable firms that are sold at auctions run by investment banks, so the purchase prices could be less than warranted by the firms' underlying value. However, despite what GPs often say, most relatively mature firms—that are the main target of buyout funds—are in fact bought at an auction, and the prices paid are likely to reflect the market's perception of the firms' fundamentals.[n]

Consequently, to earn returns sufficiently high to entice limited partners to invest, a buyout fund must have a strategy to improve the value of the firms that they purchase. A useful way of characterizing the alternative ways in which GPs can improve the value of their portfolio firms was proposed by Kaplan and Strömberg (2009): *financial engineering*, *governance engineering*, and *operational engineering*.

[m] See Nadauld et al. (2019) for estimates of the costs of trading in this market.

[n] Gompers et al. (2016) survey private equity GPs, and the median percentage of deals that are proprietary they report is 50%, which seems to be biased upwards given today's market (see table 20 of their paper).

Financial engineering refers to the way in which buyout firms optimize capital structures. As discussed in the previous section, LBOs are financed with substantial debt—far higher than observed in comparable publicly traded companies. Axelson et al. (2013) document that in their sample of over 1000 buyouts, the median deal has a 70% debt to total capital ratio, which is roughly the proportion of equity in a typical public company. Therefore, buyouts tend to invert the capital structure, with debt becoming the main source of finance in place of equity. Jensen (1986, 1989) proposes that in addition to creating tax shields, this leverage adds value by reducing the agency costs of free cash flow. Leverage creates pressure on managers to generate cash and inhibits growth that is counter to the interests of shareholders. By adding leverage to portfolio companies, their value increases because the need to use cash for interest payments reduces wasteful investments.

Buyout funds also substantially change the governance of their portfolio firms. Such governance engineering has at least two main components. First, the executives running the portfolio companies will, in general, have equity stakes that are much higher than prior to the buyout, especially when the firm was previously publicly traded. It is common for management (collectively) to hold stakes of around 10% or more in private equity-backed companies. Second, boards of directors in portfolio companies tend to be relatively small and more active, meeting fairly frequently. In public corporations, there is a natural tendency for boards to become less effective over time (see Hermalin and Weisbach (1998) and Acharya et al. (2008)). By substantially increasing pecuniary incentives and creating a more active board, GPs can increase the value of their portfolio firms through improved corporate governance.

Buyout funds are deeply involved with the operations of their portfolio companies. Such operational engineering is an important element of buyout funds' investment process. When a buyout fund acquires a firm, they normally have a plan for improving the firms' operations. There is no magic formula that characterizes the way that buyout funds change the operations of their portfolio firms. Sometimes they cut back on wasteful investments, sometimes they take advantage of scale economies or synergies by providing financing for "add on" acquisitions, and sometimes they professionalize a firm's management team. There has been an increasing trend toward funds having a roster of "operating partners" who come with deep industry expertise and take on the role of Chair of the company after it is acquired. Because competition makes funds pay full price and investments have a high required rate of return, private equity partnerships must be able to substantially increase the profitability of any firm they acquire if they are to be successful.

3.2 Flexibility and the importance of control rights

An advantage that private equity funds have over other investors is that they have the ability to base their choice of investments on the financial, governance and operational changes that they hope to make post-investment. Most investors purchase existing securities such as stocks or bonds whose returns are beyond their control, as they play little, or no, role in governance. While some investors, in particular

activist hedge funds, exert influence through "voice"—engaging with the board of directors—most investors are passive. If they are dissatisfied with the current management their only option is to "exit"—selling their stakes. In contrast, buyout funds are *active and controlling investors* and will, in general, not make investments unless they have the power to influence the firms in which they invest. In most buyouts, the fund acquires a majority voting stake in the portfolio company and consequently has voting control. However, even if a buyout fund takes a minority investment, it almost always obtains substantial control rights, often a board seat and always a significant shareholding that enables the fund to approve important firm-level decisions. Whenever the GPs feel they can increase the value of their investments, buyout funds will utilize these control rights to influence their portfolio firms' policies and, if necessary, to change the management team.

The returns of private equity funds come about in large part because the funds are able to undertake investment strategies that are simply unavailable to passive investors. For example, a fund might make an equity investment in a company that is contingent on the management cooperating with specific operational changes such as selling one business and expanding another. Or it might purchase a firm that has high-quality but underutilized assets, which is a positive NPV investment only if the acquirer has the ability to change the management team and improve the way that the assets are used. What makes each of these investments sufficiently profitable to meet the high cost of capital for buyout funds (as a result of their high fees, high risk, and low liquidity) is a fund's ability to combine the purchase of a portfolio firm's equity with the changes necessary to increase the value of the portfolio firm.

Many buyout funds have become more specialized over time. Buyouts in their modern form began in the 1980s. At that time, most funds were generalist and invested in many different industries. Since then, funds have become more specialized. Today it is common for funds to focus on a few industries. By doing so, funds' GPs become experts in these industries. They can hire full-time specialists who help them evaluate firms in these industries and manage the firms once they are acquired.

But while private equity funds do focus on particular sectors, they are not contractually limited to investing only in these sectors. They can and do take advantage of opportunities in other sectors when opportunities present themselves. Sometimes GPs raise funds explicitly to take advantage of short-term market opportunities as quickly as possible. For example, Blackstone has raised funds called "Tactical Opportunities" that are designed to invest in whatever sectors are attractive at the time, which as of 2022 had $35 billion in capital commitments.[o] Between December 2015 to March 2016, there was a sharp decline in oil prices, so the "Tac Ops" fund invested heavily in the energy sector. It did not have to approach investors when the opportunity occurred, because it had the capital already committed and was able to invest immediately. Starting in June 2016 the fund shifted its focus to the cybersecurity and cloud computing sectors which were taking off at that time.

[o]See https://www.blackstone.com/our-businesses/tactical-opportunities/.

Presumably, this fund will be able to shift into new sectors in future years as they become attractive to investors, and ultimately realize high returns for their investors.

Private equity funds have the flexibility not only to make financial, governance and operational changes to their portfolio firms, but some also can invest in whatever kinds of securities that it thinks will be most profitable. In a typical buyout, a fund purchases a controlling stake in the firm's equity while adding substantial leverage. But sometimes the fund can buy a minority stake of the equity that leaves the current management in control, perhaps with the right to take control if the management does not meet objectives. Or it can provide equity to a publicly traded corporation (known as private investment in public equity, or PIPE). Or it can invest in risky debt with the hope of exchanging it for equity (and control) in a restructuring. All these strategies, and others, are used by buyout funds as ways of earning returns for the limited partners in their funds. Since partners at private equity funds have strong pecuniary incentives and no restrictions on the type of investments they can make, GPs are always coming up with new ways to increase returns to their limited partners through creative investing strategies.

3.3 Alternative strategies to increase portfolio firms' values

Buyout funds have several common investment strategies. These strategies are the key to making buyouts profitable and generating the sorts of gross returns that will attract capital and pay for the significant management fees and carried interests to the GP. In Table 1, we provide a taxonomy of some of the most frequently observed strategies employed by GPs. Some of these relate to the pre-existing nature of the target company (e.g., family-owned or part of a conglomerate) whereas others relate to the general ways in which buyout funds transform businesses. Strategies are in no way mutually exclusive, and in practice the investment thesis of the GP will include elements of many different ways to create value.

3.3.1 Free cash flow

The early 1980s LBOs were mostly of large public firms. In many of these deals, the underlying source of value was that the firm had been wasting the firm's resources on value-decreasing investments. Jensen (1986), after observing a number of such deals, came up with one of the most important ideas in the finance literature, the "free cash flow" problem. He posited that when firms have assets that generate substantial cash flows and do not have any positive NPV projects available, they will tend to invest anyway, even if the projects that are available happen to be negative NPV. Jensen viewed leveraged buyouts as a market solution to the free cash flow problem. LBOs can increase the value of firms with assets that produce more cash than can be deployed in valuable investments by forcing the firms to use cash flow to pay interest on the debt and rather than invest it in wasteful projects. The value increase for such a buyout would come from the reduction in the quantity of value-destroying projects in which the firm invests.

Table 1 Common strategies used in buyouts to create value.

Strategy	Main features	Comments
Reduce free cash flow	Increasing leverage significantly, interest payments reduce free cash flow to focus management on generating profits and reduce wasteful expenditure	The "classic" strategy, as articulated by Jensen (1986), and still adopted in most buyouts. But since all GPs can raise leverage, such "financial engineering" is only now a competitive advantage relative to corporate acquirers. Working capital is managed by increased use of revolving credit facilities
Refocus operations	Identify and sell non-core assets, allowing increased focus on, and investment in, the highest margin/ growth parts of the business	Many companies become complex portfolios of different businesses providing few synergies, but reducing idiosyncratic risk for management. Buyout funds can reassess the importance of each asset—free from any legacy decisions or arguments—and sell or close down those that are not core, thereby simplifying operations and allowing management to focus on value creation in the core business
Enhancing executive management	Replacement of Chair, CEO or other senior executives	Not all buyouts involve widespread departures of executives, but it is common for the buyout fund to bring in one of its roster of "operating partners" to chair the board. The suitability of the C-suite will be a key focus of due diligence, and succession plans will be produced where required, with a focus on bringing in proven industry experts especially those familiar with the demands of working with buyout fund owners
Operational efficiencies	Common strategies involve improving IT systems to enhance management information, increased out-sourcing, re-negotiating supplier contracts, closing less efficient plants	Such "operational engineering" has become more important as financial engineering has become a more generic competency. Reductions in employment are often focused on less productive establishments, with more productive parts of the business growing

Continued

Table 1 Common strategies used in buyouts to create value.—cont'd

Strategy	Main features	Comments
Scale economies	Roll-ups of fragmented sectors and accelerated expansion	The roll-up strategy often involves a series of add-on acquisitions in fragmented sectors, which can often be achieved at low valuation multiples relative to the multiples associated with the market leaders. Scale can also be achieved by taking a business that has been focused domestically to other international markets, and by accelerating expansion within existing markets
Corporate orphans	Divesting business units from large conglomerates that have become focused on their core business	Many companies have become conglomerates over the years, with a range of different businesses that have only a loose economic logic tying them together. The more peripheral business units—the corporate orphans—can suffer from a lack of attention at the overall board level and may be starved of funds to invest in the business. Acquiring such business units from their parent company and giving them full attention and access to capital and expertise has been an important strategy for buyout funds
Privatization	Taking state-owned enterprises into the private sector	State-owned enterprises frequently lack autonomy, strong management and access to finance. Buyout funds can be an alternative to public listing of such businesses, and can add particular value in cases where the management needs to be improved and for assets that have not traditionally been owned privately
Transition in ownership	Enabling transition for companies which are owned by individuals or families	Businesses that grow and flourish without ever becoming public companies can often have ownership concentrated in a few individuals or a family and can face challenges in terms of succession and realization of wealth. Buyout funds can help on both fronts, bringing in management expertise and enabling the founders to exit over a period of time

Table 1 Common strategies used in buyouts to create value.—cont'd

Strategy	Main features	Comments
Distressed investments	Buying companies that are facing financial distress	This is a specialist strategy, as it requires a different set of skills related to, inter alia, acquiring and re-negotiating particular tranches of debt, restructuring existing fixed commitments, such as property leases or supplier contracts, dealing with legacy pension liabilities etc. Funds focusing on such situations are often referred to as distressed debt funds, but they often become the dominant equity owner in the same way as a buyout fund

A classic example of the free cash flow leading to a buyout was the 1988 purchase of RJR-Nabisco by KKR in 1988, which was vividly described in Burrough and Helyar's *Barbarians at the Gate*. This book colorfully describes the wasteful investments that RJR-Nabisco undertook before the buyout that RJR-Nabisco financed with cash from cigarette sales. KKR was willing to pay more than double the pre-buyout price for RJR-Nabisco largely because of the value created by cutting back on wasteful investments.

3.3.2 Refocus operations

Another characteristic of many of the 1980s LBOs is that much of the inefficient investments the firms made before they were bought out diversified the firms away from their main line of business. Consequently, many of these firms were split up after they were taken private. It often turned out that the sum of the parts were worth more separately than when combined in a single company. The presumption underlying these "de-conglomerate" buyouts is that such ill-fitting parts should not have been combined in the first place.

Both the funds' GPs and the portfolio firms' managers are strongly motivated to increase the value of their portfolio firms. Sometimes the way to increase value is to expand one particular product line while cutting back on another. A buyout fund will examine the operations of a firm it acquires, divest the portions that do not contribute to the core mission and invest in those that do. Often prior management has an emotional attachment to its historical investments or suffers from the sunk cost fallacy. A buyout fund can take a fresh look at the firm's operations without such biases, which can lead them to make value-improving changes.

3.3.3 Enhancing executive management

Sometimes a firm's problems stem not from its assets but its management. A potential source of value that can motivate a buyout is a potential management change. In a significant proportion of buyouts, the CEO, CFO or other senior executives are replaced, either immediately or after a few months (as the existing executives can be helpful in knowing where the "bodies are buried!"). Many buyout funds have "operating partners" who specialize in improving the performance of underperforming companies, either as the chair of the board, or the CEO. In addition, funds have connections with other top executives, some of whom they have worked with on prior deals, who can replace the managers of a portfolio firm if they are not performing sufficiently well.[P]

3.3.4 Operational efficiencies

Buyout funds often can increase production efficiency through several methods. Sometimes they lay off workers and sometimes they hire more. They modernize production methods, closing inefficient plants and investing in newer ones (Davis et al., 2014). Production can be moved to different locations that have lower labor costs, and contracts with suppliers can be renegotiated or new suppliers found. There are many ways in which buyout funds can make the operations of portfolio firms more efficient.

3.3.5 Scale economies: Roll ups and expansions

A common strategy of buyout firms is to take advantage of the scale economies inherent in businesses with fixed costs. For example, a doctor's or dentist's office usually has a manager for scheduling, negotiations with insurance companies, etc. Combining such offices can lead to more efficient utilization of such managers. A classic strategy of private equity firms is to "roll up" multiple such businesses in a region and combine them. These deals create efficiencies in part by better utilizing fixed assets, and by achieving other economies of scale (such as in purchasing). Ideally, when the newly formed company is sold, its cash flows are larger than the sum of the cash flows of the smaller companies would be. In addition, the sale is likely to be at a higher multiple since potential buyers prefer to acquire larger, more efficient firms. A recent example of a roll-up strategy has been seen in the cinema sector, where large numbers of smaller cinema operators have been rolled up into a few dominant chains.

Related to a roll-up is an expansion strategy. In an expansion, a buyout fund acquires a portfolio of firms, and at the time of the purchase, commits to financing "add on" acquisitions for the portfolio firms. These deals are usually in sectors where there are unexploited scale economies. The commitment to financing add-on acquisitions makes the original deal more attractive to the firm's managers, who can ultimately run a larger entity, assuming they are retained in their jobs.

[P]For discussion and evidence on the way in which CEO changes are an important element buyout of buyout firms' strategies, see Gompers et al. (2022).

Consequently, expansion strategies are a way of both facilitating the original purchase of portfolio firms and increasing their value after they are acquired.

3.3.6 Corporate orphans

Sometimes divisions in a firm get out of favor with top management and do not get sufficient resources to maximize their value.[q] These divisions are sometimes referred to as "corporate orphans," since they suffer from inattention from the parent firm. Corporate orphans can prove to be excellent targets for buyout funds. Given an incentivized management team and resources, buyout funds can often increase these firms' values substantially and earn high returns from these deals.

3.3.7 Privatization of state-owned enterprises

State-owned enterprises are often notoriously badly managed. Consequently, when they are privatized, there is much scope for improvement. Private equity funds can acquire these companies, help foster efficiencies, and increase returns through this process. The way in which state-owned enterprises are privatized varies by country. Much of the privatization in recent years has been in China, which is because it has many inefficient former state-owned enterprises. In many Chinese deals, the fund usually does not take a controlling position, since having the government with a meaningful equity stake is very helpful in doing business in that country (see Lerner and Jin (2012)).

3.3.8 Transitions in ownership

Often in privately held companies, transitions can be problematic. Founders can retire with no clear successors. And family firms can have some family members (or other investors) who wish to liquidate their stake while others want to continue managing the company. In such a situation, an investment by a buyout fund can add value by easing the transition. The fund can purchase the equity from the investors who want to exit but not the equity of those who want to remain. In such deals, control can be negotiable; a common solution is for the buyout fund to start off with a minority stake that becomes a controlling stake if objectives negotiated at the time of the deal are not met. Such an approach not only provides incentives to meet the objectives after the deal is consummated, but also motivates the management team not to overstate their forecasts to ensure that the objectives are set realistically (see Hardymon et al. (2007) for an example of such a deal).

3.3.9 Mitigating distress

When firms enter financial distress, they usually try to arrange a restructuring in which firms deliver by swapping some of their debt for equity. However, most holders of debt are passive and do not actively engage with corporate governance.

[q]See Scharfstein and Stein (2000) for a formal model of such behavior.

In addition, when debt is diffusely held, coordination problems can inhibit distressed firms from being able to complete value-increasing restructurings (see Gertner and Scharfstein (1991)). These inefficiencies present an opportunity for private equity firms to create value by facilitating restructurings in distressed firms. Typically, they purchase a large stake in the "fulcrum" debt, which is the most senior debt that would not get paid in full in a liquidation. By doing so, the fund hopes to negotiate a restructuring in which they can convert the debt to equity, gain control of the company, and enact changes to the firm's operations.

3.3.10 Other private equity strategies

This list of strategies covers the main ways in which buyouts add value to portfolio firms. However, there are many other related private equity strategies that are not technically buyouts but share some characteristics. Two in particular are worthy of mention. First, a recent trend has been for private equity funds, instead of buying firms, to take long-term leases to operate infrastructure, such as airports, toll roads, or electric utilities instead of acquiring ownership of those assets. Funds designed for these investments have raised enormous amounts of capital in recent years. Between 2015 and 2019, these funds invested $388 billion and have $217 billion of dry powder available as of 2019.[r] Infrastructure assets offer relatively safe cash flows and can earn much higher returns than those available from the fixed income market. The reason why private equity funds can offer these higher yields is that they typically can improve the operating performance of the assets.[s]

Second, although not a buyout, but an interesting type of private equity deal worth mentioning is the Private Investment in Public Equity. In a PIPE, a private equity or hedge fund negotiates a private placement with a public company. Since private equity funds charge higher fees and have higher net-of-fee required returns than other intermediaries investing in public equities such as mutual funds, they cannot satisfy their investors by simply purchasing public equities on the exchange. Usually, the firms raising capital from a PIPE do not have access to other sources of finance and for this reason, are willing to structure the transaction to provide the private equity fund a high enough expected return to induce them to invest. Specifically, funds almost always purchase the equity at a discount to the public market price, and often receive warrants in addition to the equity at this discounted price (see Lim et al. (2021) for details and statistics on PIPE transactions).

3.4 Wealth transfers

While buyout funds purport to increase the value of their portfolio firms by creating efficiencies using the strategies just described, they also can increase value by transferring wealth from other parties to themselves. This idea was originated by

[r]See https://www.ey.com/en_us/private-equity/how-pe-infrastructure-funds-are-getting-new-options.
[s]See Andonov et al. (2021) and Howell et al. (2022) for recent research about infrastructure funds.

Shleifer and Summers (1988), and the extent to which possible wealth transfers motivate buyouts, as well as mergers and acquisitions more broadly, has been an important topic of research.

Perhaps the most important source of wealth transfers is from the government from reduced corporate taxes (see Kaplan, 1989b). The evidence that buyout funds pay lower corporate taxes is indisputable, since they employ much higher leverage. However, there is uncertainty about the amount of value that is transferred through tax reductions, and whether the benefits of such financial engineering accrue to the investors in the fund rather than the vendors of the companies that are acquired.

In addition, there are studies that evaluate whether buyout funds achieve their returns in part by cutting corners on quality, safety, working conditions, investment, R&D, etc. In general, the evidence is mixed and varies across sectors. However, it should be emphasized that the main constraint facing any buyout fund is the need to sell their portfolio companies to willing buyers. Cutting corners, reducing costs in an unsustainable way, reducing product quality and similar actions that transfer wealth from a firm's customers or employees are tempting to boost short-run financial results, but are unlikely to maximize the price an acquirer will pay for a portfolio firm.

4 Facts about buyouts

4.1 A brief history of the industry

Since the first leveraged buyout in the 1960s, the buyout sector has grown tremendously. Total buyout assets under management have grown to about $2.5 trillion as of 2020. The sector has experienced several booms and busts that have been highly correlated to the business cycle. This section discusses facts related to the buyout market, across time and geography, to help understand the dynamics of the market as a whole and to provide intuition as to how the market will develop in the future.

The leveraged buyout market began in the 1960s when public companies made acquisitions funded mainly by debt, which were then called "bootstrap transactions."[t] A well-known early deal was the acquisition of Pan-Atlantic Steamship Company in 1955 by a financier named Malcom McLean. To finance the deal, McLean borrowed $42 million and raised $7 million through preferred stock. After the acquisition, McLean invested in containerized shipping, which increased efficiency in the shipping business.[u]

The idea of using a highly leveraged transaction to take companies private was adopted by investors such as Victor Posner, who created the term "leveraged buyout."[v] Leveraged buyouts gained popularity when investment companies were

[t]See Vadapalli, 2007. *Mergers, Acquisitions and Business Valuation*. Excel Books India for a detailed history of the LBO market.
[u]See https://www.pbs.org/wgbh/theymadeamerica/whomade/mclean_hi.html.
[v]See Trehan (2006). The History of Leveraged Buyouts. *4Hoteliers*.

established with relatively small amounts of equity, with the intention of buying much larger companies by raising debt secured on the assets of the target. Early investors were Jerome Kohlberg, Henry Kravis, and George Roberts who established KKR and raised $30 million in 1978, and companies like Thomas H. Lee Partners, Cinven, Forstmann Little & Company, Welsh, Carson, Anderson & Stowe, Candover, and GTCR. Most of these firms remain large private equity investors today. Among these, Cinven and Candover, both based in London, were among the earliest European buyout firms when private equity spread outside the US market in the 1980s.

The 1980s saw a proliferation of LBOs, a number of which were "hostile." As the market developed there were some iconic deals that shaped the future of the industry. One of the first was Wesray Capital's investments in Gibson Greetings in 1984, which was exited in a $290 million IPO 16 months after acquisition and generated a profit of $66 million for Wesray. The rising stock market in the 1980s helped enable profitable exits for many buyouts, and investment bankers were increasingly prepared to provide significant leverage to finance LBOs. Michael Milken at Drexel Burnham Lambert become famous for developing the market for high-yield debt financing for buyouts, which were commonly referred to as "junk bonds." Supported by the ready availability of high-yield debt, the size of buyout deals quickly snowballed with the most famous deal ever executed occurring in 1989: the acquisition of RJR Nabisco by KKR for around $25 billion.[w]

However, by the end of the 1980s, the market started to overheat and several large buyouts like Federated Department Stores, Revco, Walter Industries, FEB Trucking, and Eaton Leonard went into bankruptcy under the burden of their high-yield debt, and rising interest rates. RJR Nabisco itself was financially constrained under the huge interest burden, despite significant asset sales that were used to repay debt. It eventually had to be recapitalized, with KKR putting in additional $1.7 billion in 1990. Not only did high-yield debt begin to default but large buyouts in the late 1980s had to cut expenses aggressively, often through layoffs, as free cash flow became constrained. The boom cycle came to an end in the early 1990s, which also witnessed public companies adopting anti-takeover defenses like poison pills, which protected themselves from hostile bids.

After the recession of the early 1990s, and in response to the failures and criticisms of the earlier deals, buyouts returned in the mid-1990s with an increased focus on generating long-term value for their portfolio companies. Transactions had much lower leverage, with debt to value ratios of 20–40% compared with the 85–95% in the 1980s. Thomas H. Lee Partners' success with Snapple Beverages in 1992 was a watershed deal that led to entry into the sector. Only 2 years after the takeover, Lee took Snapple Beverage public and sold it to Quaker Oats for $1.7 billion, resulting in a $900 million profit. The credit market started to open up again with investors willing to lend capital to finance LBOs, and the mid-1990s saw a second bloom in the

[w]See Burrough and Helyar, 1990. Barbarians at the Gate. *Harper and Row*.

industry with a number of important deals like Duane Reade, Sealy, KinderCare Learning, J. Crew, Domino's, Regal Entertainment, Oxford Health Plans, and Petco.

The sharp stock market decline in 2000 hit the buyout market hard, especially deals in the telecommunication sector. The credit market started to tighten up again and the number of deals decreased sharply. Two partnerships that were hit particularly hard were Hicks Muse Tate & Furst and Forstmann Little & Company, both of which had invested in technology companies right before the internet bubble burst.[x]

Valuation multiples were much lower in the early 2000s, which was commonly attributed to tighter lending conditions. In addition, most of the deals that were done were relatively small. However, those deals that were made during this time turned out, on average, to be very profitable.

The mid-2000s saw a third boom in the buyout market. Decreased interest rates and loose credit conditions led to a number of very large deals. At the same time, regulation changes relating to public equity markets, such as the Sarbanes-Oxley Act, made private ownership more attractive. Fundraising and deal volume increased substantially, with buyout funds investing a record $280 billion in 2006 and $290 billion in 2007. The largest buyout deals that were made in this period included the acquisition of Georgia-Pacific Corp (2005), Albertson's (2005), EQ Office (2007), Freescale Semiconductor (2006), Ally Financial GMAC (2006), Chrysler (2007), First Data (2007) and TXU (2007).

The buyout boom came to an abrupt halt with the Financial Crisis in 2008. The credit market dried up completely when investment banks were struck by defaults in the mortgage market. Debt financing became highly constrained, the market for collateralized loan obligation (CLO) funds (into which much LBO debt was sold) froze, and the number of buyout transactions dropped significantly.

However, both the equity market and the buyout market rebounded relatively quickly, and deal volume has steadily been increasing since 2009. The continued economic recovery over the next decade resulted in a huge growth in the buyout sector, which today manages around $2.5 trillion in assets. The growth and entry of GPs has resulted in significantly more competition for deals in both the US and Europe, both of which are now relatively mature markets. One implication of this increased maturity of the buyout market is that there is increased competition for deals, which could potentially lower returns for buyout investors.

As we are writing this chapter, we are in the middle of the Covid-19 pandemic. What was remarkable in this crisis was the fast rebound of buyout deals—and, indeed, valuations—after the initial impact of the pandemic at the start of 2020. The window of opportunity for investing at depressed values was only open for a few months before markets recovered and prices increased. Furthermore, at the start of the pandemic buyout funds were sitting on record amounts of undrawn capital commitments (dry powder) and this resulted in a very active buyout market from mid-2020 onwards.

[x]See Forbes. (2001). Forbes Faces: Thomas O. Hicks. *Forbes*.

Having given this brief historical overview of the development of the buyout sector, the sections below will present detailed evidence on how buyouts have evolved over time and across different regions.

4.2 The evolution of the buyout market

Fig. 5 illustrates the evolution of the buyout market. Fig. 5A presents the amount of capital and the number of funds raised in the buyout market each year, across different geographic regions since the mid-1990s. Fig. 5B presents the number and the total value of buyout deals across time and region and the total value of deals made each year. Fig. 5C presents buyout deals in comparison to the total M&A market in the United States. Fig. 5A and B are generated from data provided by Preqin and Fig. 5C is generated by data from Thomson via OneBanker.

From Fig. 5A and B, we see that the number of funds, deals, the total value of deals as well as the amount of capital raised strongly co-move with the credit cycle. Prior to the 2000 stock market decline, the amount of capital raised had more than tripled over the prior 5-year period. The number of deals increased substantially in 2000 as well but fell dramatically the following year. During the 2001–2003 recession, there were not many deals. The market heated up when the credit market boomed—with loosened credit conditions—in the mid-2000s. Capital raised during 2007 was around $250 billion, about 2.5 times the amount raised in 2004. The number of deals also hit a peak at about 4600 deals in a single year in 2007 and buyout deals comprised about a quarter of total M&A activity.

After the 2008 Financial Crisis, US capital-raising was cut in half in 2009. Given its dependence on the availability of debt financing, the buyout market was hit harder than the overall M&A market. Buyout deals comprised only 7% of the total M&A deal value in 2009, in comparison to 24% in 2007. The buyout market recovered relatively quickly after the Financial Crisis and has stayed buoyant, even through the 2020–21 pandemic.

Recent years have seen a large increase in the number of funds and capital raised. The number of deals remains below the level of 2007, but the deal value exceeds the 2007 level, which suggests that there is more capital being raised relative to the number of deals, and that funds are paying higher price per deal. Not surprisingly, there have been concerns from the media that there is now too much money chasing too few deals.[y] And the US market seems to be at the core of the problem compared to other regions; the increase in the amount of capital raised is mainly driven by the US market, while the number of deals made in the United States has not changed much since 2007.

Table 2 presents the distribution of the number of deals within a fund for each year and across different geographical regions. The table was generated from deal-level data provided by Preqin.

[y]As reported by https://www.wsj.com/articles/buyout-funds-have-money-to-burn-and-thats-a-problem-1503680385.

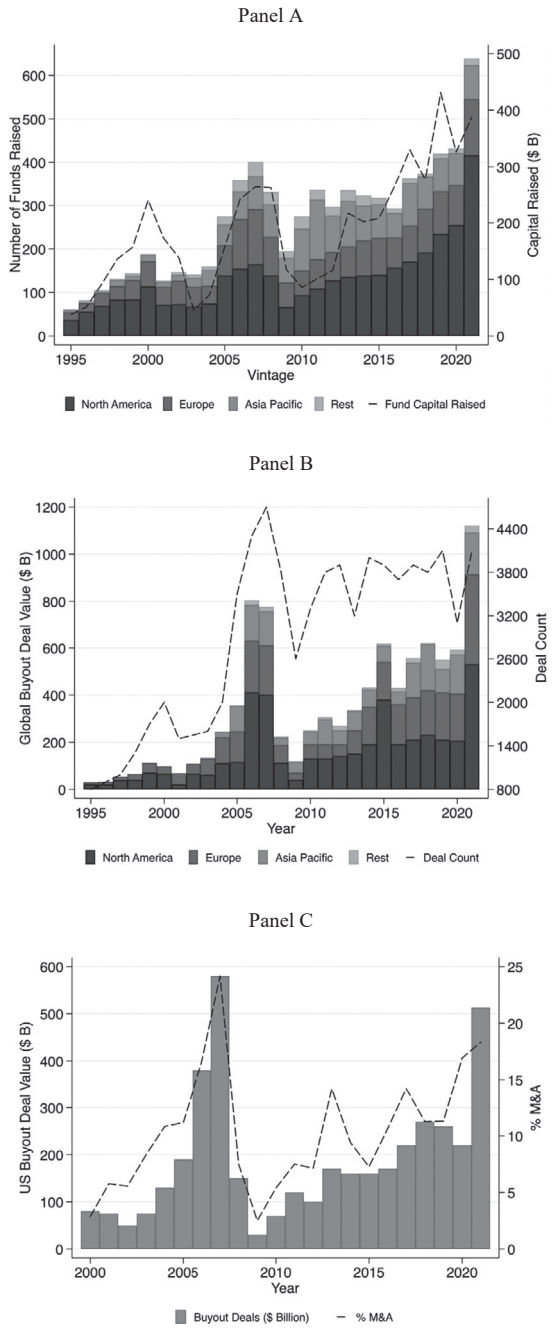


FIG. 5

The overall evolution of the buyout market. This figure shows the overall evolution of the buyout market. (A) The number of funds (bar, left Y-axis) and the capital raised by these funds (dashed line, right Y-axis). The sample includes periods from 1995 to 2021 in regions such as North America, Europe, Asia Pacific, and the Rest of the World. The data is provided by *Preqin*. (B) The total value of buyout deals (bar, left Y-axis) and the total deal count (dashed line, right Y-axis). The samples include periods from 1995 to 2021 in regions such as North America, Europe, Asia Pacific, and the Rest of the World. The data is provided by *Preqin*. (C) The capital invested in buyout deals (bar, left Y-axis) and the percentage of buyout deals out of the total M&A activities (dashed line, right Y-axis). The sample includes periods from 2000 to 2021 in the US market only and the data is provided by *Refinitiv*.

Table 2 The number of deals in a fund.

Number of deals in a fund								
	Obs.	**Mean**	**Std**	**Min**	**p25**	**p50**	**p75**	**Max**
North America								
1995–2000	297	9.36	9.06	1	3	7	12	51
2001–2007	653	15.85	18.76	1	4	10	19	174
2008–2009	169	18.14	18.98	1	5	13	23	107
2010–2016	715	12.89	15.32	1	4	8	16	147
Mean	458.5	14.06	15.53	1	4	9.5	17.5	119.75
Europe								
1995–2000	146	9.04	9.81	1	3	6	12	85
2001–2007	425	13.13	14.32	1	5	9	16	117
2008–2009	120	12.07	11.36	1	5	9	15	59
2010–2016	416	10.33	10.66	1	3	7	13	74
Mean	276.75	11.1425	11.5375	1	4	7.75	14	83.75
Asia Pacific								
1995–2000	32	3.69	2.55	1	1.5	3	5.5	9
2001–2007	161	6.87	5.9	1	2	5	10	31
2008–2009	74	5.57	5.24	1	2	4	8	33
2010–2016	304	5.27	5.31	1	1.5	3	7	29
Mean	142.75	5.35	4.75	1	1.75	3.75	7.625	25.5
Rest								
1995–2000	8	4.25	3.28	1	1.5	3.5	6.5	10
2001–2007	66	7.11	5.82	1	3	6	8	27
2008–2009	31	4.87	4.93	1	1	4	6	24
2010–2016	98	4.16	3.85	1	2	3	5	27
Mean	50.75	5.0975	4.47	1	1.875	4.125	6.375	22

This table shows the number of deals in a fund broken down by time and region. The sample includes funds with vintage years from 1995 to 2016 in regions such as North America, Europe, Asia Pacific, and the Rest of the World. The first column presents the vintage year groups. We report the number of funds, mean, standard deviation, the minimum, the bottom 25%, 50%, and 75%. The data was provided by Preqin.

The average number of deals per fund varies by region. On average, North American funds have 13 deals in a fund, with European funds having slightly fewer at 11. However, Asian funds and funds from the rest of world are smaller and more concentrated, having only on 5 deals per fund on average. The distribution is highly right skewed for all years and geographical regions. While the median number of deals are around 9 and 8 for North American and European funds, some funds have well over a hundred investments, many of which are small investments in deals that are syndicated by other GPs.

In the non-US market, European funds follow a similar pattern as the North American funds. The largest number of deals in a fund appeared during the 2000s before the Financial Crisis and dropped significantly during the crisis, due to the decline in the number of mega funds raised during the period. Meanwhile, the number of deals made in funds from Asia-Pacific grew substantially during the 2000s and is currently between 5 and 6.

4.3 Assets under management and dry powder

Fig. 6A presents statistics on assets under management over time and across regions. The data are provided by Burgiss. We observe two buyout booms in Fig. 6A, during the 2005–2007 and 2016–2021 periods. The North American and Asian markets grew particularly rapidly during these two periods. Other than during the Financial Crisis, the buyout market grew continuously over the past 20 years, setting a record-level of asset under management in recent years. As of 2021, the assets under management by the buyout funds have reached almost $2.7 trillion combining the three regions: $1.7 trillion in North America, $700 billion in Europe, and $270 billion in Asia.

Fig. 6B presents the amount of uncalled committed capital (dry powder) across time and location. Despite the strong pace of investments being made since the mid-2010s, fundraising has been sufficiently high so that the quantity of dry powder available for future investments has increased as well. The total quantity of worldwide dry powder reached a peak of about $800 billion in 2020. Because there is so much dry powder available, there has been increased competition for deals which is likely a reason for the high valuation multiples for deals occurring in recent years.

Although the amount of assets under management has reached the peak in 2021, we observe a decline in the amount of dry powder in 2021, mostly coming from North America. Analyst reports have attributed the decline to the sharp increase in the public-to-private (P2P) transactions in North America and in Asia. Especially, during 2021, there has been a surge of software P2P deals that are large in value which naturally absorbed a lot of dry powder from the buyout funds that were waiting to be spent.[z]

[z]See https://www.bain.com/globalassets/noindex/2022/bain_report_global-private-equity-report-2022.pdf

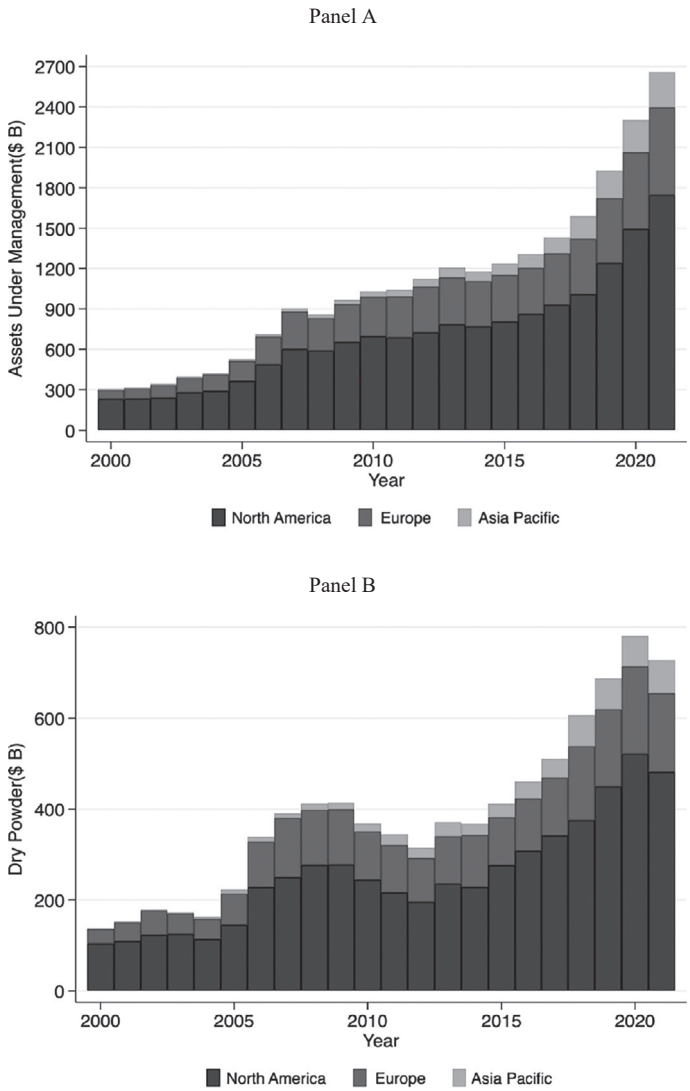


FIG. 6

AUM and Dry powder. This figure shows the asset under management (A) and the amount of dry powder (B) in the buyout market across time and region. The sample includes periods from 2000 to 2021 in North America, Europe, and Asia Pacific. The data is provided by *Preqin*.

4.4 Fund performance over time by location

Table 3 presents the distribution in fund performance by vintage year and geographical region. Panel A presents performance measured using the TVPI (Total Value to Paid In Capital) and Panel B presents PME (Public Market Equivalent) returns.

Table 3 Buyout fund performance by vintage year and region.

	North America				Europe				Asia Pacific			
Vintage	**Mean**	**95th**	**50th**	**5th**	**Mean**	**95th**	**50th**	**5th**	**Mean**	**95th**	**50th**	**5th**
Panel A. TVPI												
1995	1.59	2.71	1.53	0.61	0.59	0.60	0.60	0.60	0.88	0.90	0.84	0.78
1996	1.71	2.68	1.39	0.36	1.93	2.42	1.80	1.47	1.08	1.08	1.08	1.08
1997	1.51	2.17	1.21	0.58	1.96	2.23	1.83	0.91	1.46	1.51	1.50	1.48
1998	1.31	2.44	1.44	0.35	2.09	2.85	1.53	1.15	1.14	1.62	1.38	0.73
1999	1.46	2.63	1.57	0.29	1.85	2.11	1.65	0.30	1.08	1.12	1.04	0.96
2000	1.85	2.92	1.74	0.49	2.17	2.61	1.72	0.95	1.87	1.97	1.58	1.49
2001	1.97	3.01	1.93	0.91	2.15	2.91	1.94	1.12	3.59	3.57	3.11	2.65
2002	1.93	2.54	1.81	1.06	2.15	3.29	1.91	1.36	2.84	2.36	2.36	2.36
2003	2.06	3.31	1.77	1.08	2.09	2.92	1.78	0.58				
2004	1.79	3.00	1.61	0.94	1.68	2.71	1.80	0.85	1.73	2.17	1.67	0.86
2005	1.61	3.03	1.54	0.73	1.57	2.09	1.45	0.81	1.51	2.32	1.48	0.79
2006	1.56	2.77	1.63	0.71	1.29	2.47	1.58	0.53	1.35	1.94	1.31	0.37
2007	1.71	2.88	1.73	0.77	1.41	2.35	1.50	0.69	1.73	2.84	1.54	0.62
2008	1.70	2.98	1.68	0.62	1.62	2.31	1.56	0.58	1.37	3.07	1.50	0.64
2009	2.09	4.27	2.04	0.72	1.53	2.31	1.74	1.09	1.20	1.77	1.47	1.10
2010	1.84	3.05	1.84	0.88	1.47	2.75	1.73	0.50	1.52	3.40	1.48	1.07
2011	2.06	3.28	1.90	0.94	1.67	2.91	1.78	0.94	1.38	2.35	1.81	0.91
2012	1.87	2.90	1.81	0.84	1.73	2.34	1.63	1.15	1.77	2.44	1.62	1.35
2013	1.85	2.83	1.76	1.17	1.61	2.82	1.58	1.29	1.53	3.30	1.48	1.13
2014	1.92	3.21	1.67	0.84	1.85	2.97	1.53	1.11	1.48	1.76	1.50	1.29
2015	1.76	2.80	1.50	1.11	1.60	2.03	1.52	1.13	1.38	1.62	1.40	0.90

Continued

Table 3 Buyout fund performance by vintage year and region.—cont'd

	North America				Europe				Asia Pacific			
Vintage	**Mean**	**95th**	**50th**	**5th**	**Mean**	**95th**	**50th**	**5th**	**Mean**	**95th**	**50th**	**5th**
2016	1.62	2.61	1.53	1.01	1.51	1.81	1.39	1.06	1.49	2.00	1.43	1.00
2017	1.64	2.31	1.54	1.12	1.48	1.83	1.21	0.74	1.58	1.84	1.59	1.39
2018	1.35	1.77	1.26	1.01	1.31	1.76	1.15	0.75	1.24	1.49	1.00	0.84
2019	1.28	2.02	1.13	0.74	1.13	1.40	0.94	0.52	1.26	1.74	1.13	0.94
2020	1.09	1.43	1.00	0.16	1.28	3.00	0.87	0.20	1.01	1.36	0.99	0.29
2021	1.19	1.24	1.00	0.63	0.98	0.83	0.58	0.33	0.97	0.99	0.93	0.86
(All)	1.69	3.05	1.56	0.71	1.60	2.68	1.51	0.65	1.48	2.50	1.43	0.74
Panel B. PME												
1995	1.11	1.7	1.03	0.4	0.43	0.43	0.43	0.43	0.71	0.72	0.68	0.64
1996	1.27	1.87	1.11	0.29	1.27	1.58	1.47	0.95	0.94	0.94	0.94	0.94
1997	1.24	1.85	1.03	0.59	1.69	2.10	1.52	0.80	1.28	1.32	1.26	1.19
1998	1.2	2.27	1.44	0.35	1.91	2.90	1.47	1.10	1.02	1.47	1.14	0.74
1999	1.27	2.09	1.39	0.28	1.51	1.64	1.37	0.32	1.08	1.09	1.06	1.02
2000	1.4	2.6	1.34	0.47	1.77	1.97	1.39	0.88	1.63	1.69	1.34	1.31
2001	1.47	2.38	1.52	0.66	1.53	2.01	1.44	0.75	2.97	2.92	2.68	2.43
2002	1.42	1.85	1.32	0.8	1.48	2.43	1.43	1.10	2.39	1.99	1.99	1.99
2003	1.55	3.01	1.33	0.73	1.60	2.06	1.43	0.41	1.52	1.78	1.51	0.75
2004	1.35	2.31	1.25	0.66	1.36	2.10	1.39	0.73	1.32	2.25	1.30	0.71
2005	1.15	2.09	1.05	0.45	1.32	2.01	1.21	0.64	1.04	1.40	0.93	0.32
2006	1.01	1.69	1.08	0.51	1.03	1.83	1.21	0.43	1.12	1.78	1.04	0.42
2007	1.02	1.71	1.08	0.47	1.05	1.64	1.19	0.46	0.92	1.91	0.93	0.42
2008	1.02	1.6	0.93	0.37	1.12	1.58	1.07	0.37	0.74	1.04	0.88	0.73
2009	1.17	1.84	1.19	0.51	1.06	1.62	1.19	0.82	0.88	2.24	0.80	0.65

2010	1.01	1.7	1.01	0.52	0.98	1.87	1.24	0.34	0.88	1.43	1.07	0.47
2011	1.13	1.82	1.14	0.53	1.17	2.15	1.29	0.61	1.15	1.58	1.04	0.82
2012	1.13	1.8	1.12	0.57	1.26	1.63	1.30	0.79	1.03	1.82	1.09	0.73
2013	1.13	1.81	1.1	0.68	1.24	1.92	1.28	0.99	1.06	1.37	1.11	0.86
2014	1.2	2.01	1.05	0.5	1.47	2.32	1.32	0.87	0.96	1.19	1.01	0.64
2015	1.13	1.6	1.03	0.71	1.32	1.71	1.26	0.95	1.05	1.31	1.02	0.72
2016	1.05	1.68	1.06	0.7	1.25	1.49	1.23	0.91	1.21	1.41	1.25	1.00
2017	1.16	1.68	1.12	0.8	1.27	1.54	1.06	0.70	0.97	1.18	0.83	0.65
2018	1.02	1.32	0.98	0.76	1.13	1.52	1.04	0.70	1.03	1.45	0.93	0.80
2019	1.02	1.59	0.92	0.59	0.97	1.29	0.87	0.55	0.89	1.24	0.77	0.26
2020	0.93	1.25	0.87	0.14	1.08	1.88	0.76	0.24	0.97	0.99	0.91	0.83
2021	1.12	1.16	0.95	0.63	0.94	0.81	0.56	0.31	0.71	0.72	0.68	0.64
(All)	1.17	1.97	1.06	0.49	1.26	2.00	1.20	0.56	1.07	1.79	1.01	0.53

The table shows the performance distribution of buyout funds. The sample includes funds with vintage years from 1995 to 2021 in North America, Europe, and the Asia Pacific. Panel A presents the total value paid-in (TVPI) as the performance measure, and panel B presents the public market equivalent (PME) as the performance measure. The benchmark public equity index for North America is S&P 500, MSCI Europe for Europe, and MSCI World for Asia. Both tables present the mean, the bottom 95%, 50%, and 5% performance across vintage years and regions. The data is from Burgiss.

All these returns are net of management fees and carried interest; in other words, they are the returns that the LPs actually receive. However, for funds that have not yet distributed all their capital, reported returns value not yet exited deals at NAV, which likely understates the performance they will ultimately achieve.

Overall, it is evident that the buyout market has almost always outperformed public markets in each region. An exception are funds investing in the Asia-Pacific region, where we see many vintage years in which buyouts have underperformed public markets.

There is a counter-cyclical pattern to returns, with higher returns for funds with vintage years during recessions. However, calls and distributions tend to be higher when economic conditions are strong. If we compare 1995–1999 to 2000–2002 and 2005–2007 to 2008–2009, we observe that funds raised during the 2000–2002 recession and the 2008–2009 Financial Crisis had higher returns than before these crises when the market was at near a peak. Interestingly, PMEs are also higher during the down cycles indicating that buyout funds can take advantage of depressed markets, when competition from corporate acquirers is likely to be lower.

4.5 Purchase prices and leverage multiples

Fig. 7 presents the average EBITDA-to-purchase-price (enterprise value) multiples by year for US and European markets. The data come from the LCD global.

FIG. 7

The average EBITDA purchase price multiples. The figure presents the average EBITDA purchase price multiples. The sample includes deals invested from 1999 to 2020 in the United States and in Europe. The data is from the *LCD global.*

Purchase price multiples have increased over time, with the average multiple being around 11–12 times EBITDA in 2020. To some extent, these high multiples reflect movements in interest rates: as interest rates fell after the Financial Crisis, the cost of capital was reduced and asset values rose. In addition, the increased competition for deals resulting from the high quantities of dry powder also probably explains some of the increase.

Multiples appear to be pro-cyclical. During the downturns in the early 2000s and during 2007–2008, we see a clear downward movement in price multiples. On the other hand, during the boom cycles, such as 2005–2007 and 2014–2020, we see a noticeable increase in multiples. Yet, the median PME and TVPI during 2005–2007 and 2014–2020 in Table 3 suggest the buyout market being over-heated during the periods, as the buyout fund performance is lower.

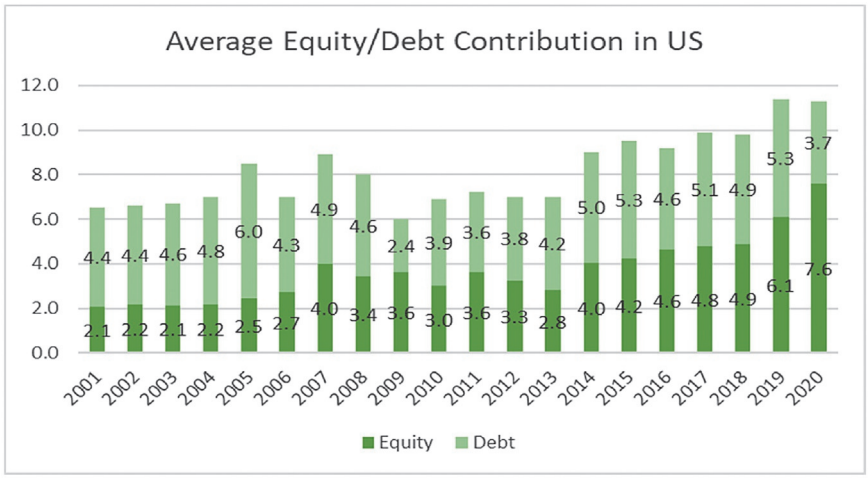
Fig. 8 presents the average contributions of equity and debt over time for US and European deals. On average, 55% and 60% of the contribution comes from debt financing for the US and European markets, respectively. To examine the numbers by splitting the samples based on time, pre-crisis, the debt contribution used to be around 68% for both markets while the debt multiples remained around 4.7 and 5.4 for the US and European markets, respectively. During the Financial Crisis, the debt contribution went down to about 50% of the total with debt multiples around 2.4 and 3.9 for the US and European markets, respectively. Post-crisis, the debt contribution remained to be about a half, but the debt multiples recovered to the points where they used to be in the pre-crisis period. This pattern occurs because the deals have become more expensive, and the purchase price multiples have increased post-crisis. The recent 5–6 years have especially seen a huge increase in the purchase price multiples with tech buyouts being particularly expensive ($\approx$16–22$\times$ EBITDA).

In the United States, credit conditions started to slowly recover from the financial crisis in 2009, while in Europe, tight credit supply remained until 2012. In recent years, there have been more generous equity financings in the United States and the debt contribution to buyouts has been decreasing trend.

4.6 Exits

Table 4 presents information on the different routes by which the LBO fund exits their deals, broken down by time and region. The table is generated from the deal-level data provided by Preqin from 1990 to 2019. Most buyout deals in the 1990s were in North America and Europe. The largest number of deals in both North America and Europe at the time were exited through trade sales, which are sales to corporate acquirers, followed by IPO which was the second most popular exit type. The two types combined were responsible for 66% and 60% of all exits for North America and Europe, respectively. Buyout markets in Asia and the rest of the world were not very popular during the 1990s, with only a few exit deals, mostly by trade sales and IPO. In particular, the most popular exit route in Asia during the time was through an IPO.

Panel A



Panel B

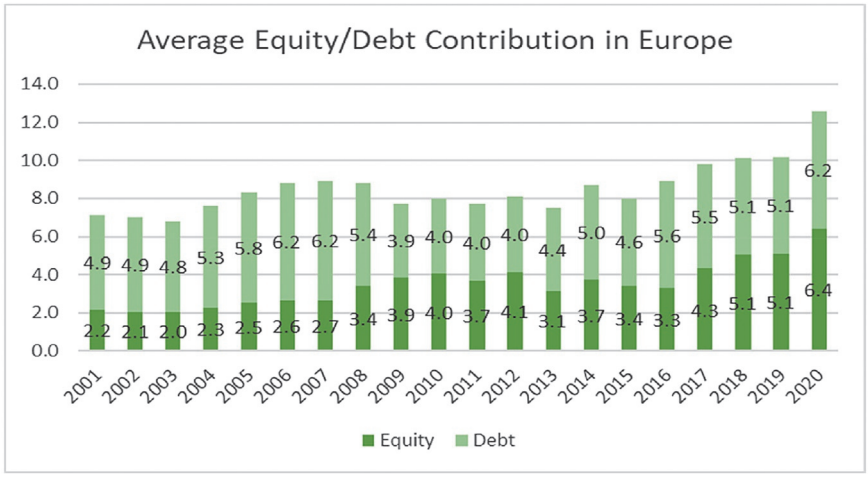


FIG. 8

Average equity and debt contribution. The figures show the average equity to debt contribution of buyout deals in the United States and Europe. The sample includes deals invested from 2001 to the first quarter of 2020. The data is from *LCD global.*

In the 2000s, trade sales were the most popular form of exit for all regions. About 37% of all exits were through trade sales during this period. The IPO market cooled for North America and Europe, and the share of IPO exits shrank to below 10% for both regions. Instead, as the number of buyout funds increased, buyout funds became active buyers of deals, and sales to other GPs, which is known as a secondary buyout,

Table 4 Exit types.

Exit Type	Geography	1990s	2000s	2010s
IPO	North America	199	389	472
Merger		44	302	1339
Private Placement		25	207	805
Recapitalization		9	165	526
Restructuring		5	208	342
Sale to GP		73	885	3083
Sale to Management		8	60	118
Trade Sale		302	1571	4765
Unspecified Exit		92	349	550
Write Off		4	227	358
IPO	Europe	125	241	401
Merger		6	148	706
Private Placement		9	90	556
Recapitalization		2	54	176
Restructuring		1	76	259
Sale to GP		28	966	2828
Sale to Management		7	159	347
Trade Sale		145	1409	3724
Unspecified Exit		143	519	576
Write Off		0	60	224
IPO	Asia	12	184	649
Merger		2	22	126
Private Placement		1	92	783
Recapitalization		0	2	39
Restructuring		0	10	48
Sale to GP		1	68	458
Sale to Management		0	12	95
Trade Sale		7	210	1054
Unspecified Exit		5	66	312
Write Off		0	9	43
IPO	Rest	2	43	117
Merger		0	10	68
Private Placement		0	17	93
Recapitalization		0	0	7
Restructuring		0	1	8
Sale to GP		1	27	159
Sale to Management		0	6	29
Trade Sale		3	104	396
Unspecified Exit		0	38	143
Write Off		0	2	13

The table presents the buyout deal distribution by exit types, geography, and time horizons (decades). The sample includes deals that are from 1990 to 2019 in North America, Europe, Asia Pacific, and the rest of the World. The data is from Preqin.

became the second most popular form of exit. Asia and the rest of the world followed similar trend—the share of IPO exits went down, and the share of sales to other GPs increased, but IPO exits were still the second most popular exit route.

In the 2010s, there was an increasing trend in the share of sales to other GPs exits, and a decreasing trend in the share of IPO exits persist in both North America and Europe. More than a quarter of deals in North America and Europe was exited through sale to other GPs, while trade sales were still the most popular exit route. Asia and the rest of the world followed a similar pattern, but these two regions have experienced an immense increase in the share of exits through private placements. For Asia, private placements are now the second most popular exit type.

Across all regions and time, sales to manager exits are rare; on average, 2% of all exits are by selling to the portfolio company managers. The write-off is also very rare, comprising only 1% of all exits. However, in North America, the fraction was as high as 5% during the Financial Crisis.

4.7 Fund fee distribution

Table 5 presents the fund fee structure distribution over time and geographical region. The table is generated from Stepstone fund fee data.[aa] Table 5 confirms the fact that 2–20 (i.e., 2% of annual management fee and 20% of carried interest) is the most widely used fee structure in private equity. There is a remarkable consistency in carried interest, with about 95% of GPs charging exactly 20%. Management fees do vary more widely. The median management fee has remained around 2%, except in Europe where it has gone down slightly to 1.8 in recent years (2016–2020). The median GP stake in the fund is around 4.5% in North America but slightly lower in Europe or Asia.

One thing to note is that the data is from 1970 to 2020 and since 2020, the management fee for most buyout funds have gone down to 1.5%.

5 The academic literature on buyouts

Given the large increase in the volume of buyouts in recent years, it is not surprising that there has been a corresponding increase in academic research on buyouts. This research has yielded several insights about buyouts' performance, their investors, and the role that governance plays, both in terms of the buyout funds themselves and also about the portfolio firms in which they invest.[ab]

An important consideration in all empirical research about buyouts is the availability of data. Data on almost all aspects of private equity is of far worse quality than

[aa]We thank Wayne Lim for providing this Table. A more in-depth analysis of private equity fund economics can be found in Lim et al. (2021).

[ab]An earlier survey that discusses a number of studies we are not able to cover here is Eckbo and Thorburn (2013).

Table 5 Fund fee structure

	Fund Size ($M)				Management Fee (%)					Carry (%)					GP Share of Fund (%)			
Vintage	**N**	**Mean**	**Median**	**SD**	**N**	**Mean**	**Median**	**SD**	**Fraction =2%**	**N**	**Mean**	**Median**	**SD**	**Fraction =20%**	**N**	**Mean**	**Median**	**SD**
Panel A: North America																		
1970–2000	906	307	150	528	112	1.9	2	0.4	75.00%	109	20.1	20	1.6	95.40%	107	4.5	3	5.25
2001–2005	609	472	252	685	119	2	2	0.2	85.70%	122	20.1	20	0.9	96.70%	121	4.6	2.7	4.54
2006–2010	411	753	364	1307	119	2	2	0.2	75.60%	118	20	20	0.8	96.60%	116	4.2	3	3.51
2011–2015	266	1048	550	1409	102	2	2	0.2	78.40%	102	20	20	1.2	97.10%	100	4.6	2.7	4.94
2016–2020	173	1643	750	2832	63	2	2	0.2	74.60%	64	19.9	20	0.6	98.40%	63	4.3	2.5	6.62
Panel B: Europe																		
1970–2000	478	290	150	490	18	1.9	2	0.3	72.20%	19	19.4	20	2	89.50%	16	3.9	2.5	4.66
2001–2005	351	433	223	664	30	1.9	2	0.3	63.30%	31	20.1	20	1	90.30%	30	3.8	2	4.32
2006–2010	229	683	314	1080	33	2	2	0.2	66.70%	35	20.1	20	0.9	97.10%	30	3.3	2	3.12
2011–2015	137	973	380	1602	30	1.9	2	0.2	63.30%	31	19.8	20	1.4	96.80%	30	2.8	2	2.32
2016–2020	86	1483	515	1957	25	1.8	1.8	0.2	40.00%	25	20.2	20	1	96.00%	23	5	3	8.12
Panel C: Asia																		
1970–2000	178	342	126	603	13	2	2	0.3	69.20%	12	20.8	20	2.9	91.70%	11	4.9	2	5.78
2001–2005	115	407	200	736	14	2	2	0.4	64.30%	13	20.8	20	2.8	92.30%	10	3	2	2.84
2006–2010	77	692	332	1102	20	1.9	2	0.1	75.00%	20	20	20	–	100.00%	18	5	2.3	6.41
2011–2015	51	1114	500	1600	21	1.9	2	0.2	76.20%	21	20	20	–	100.00%	21	2.8	2	2.61
2016–2020	20	1845	920	1937	13	1.9	2	0.2	76.90%	13	20	20	–	100.00%	13	2	2	0.74

This table presents statistics of the fee contract between GPs and LPs in buyout funds. The buyout fund sample includes vintage years from 1970 to 2020 in North America, Europe, and Asia. Panels A, B, and C presents buyout fund fee contracts in North America, Europe, and Asia, respectively. The sample includes only GP's main buyout funds (side vehicles, non-main strategies, etc. excluded) that are bigger than 5m in 1990 dollar terms. The 4 columns after vintage represent the number of funds, mean, median, and standard deviation of fund size (in $ million), columns 6–10 present the number of funds with management fee data available, mean, median, standard deviation of management fee, and the fraction of funds with 2% management fee, columns 11–15 present the number of funds with carried interest data available, mean, median, standard deviation of carry, and the fraction of funds with 20% of carry, and columns 16–19 present the number of funds that disclose GP's share of fund, mean median, and standard deviation of GP's share of fund.

comparable data on public firms. Since buyout funds and their portfolio firms are private, there does not exist price data from trades at regular frequencies for either funds or their portfolio companies. In addition, much of whatever data that does exist is usually private and not accessible to researchers. Finally, the data that is available publicly, especially relating to performance, can be selectively revealed, which can give scholars a misleading picture of the private equity industry. Addressing these issues is a major consideration in many of the papers discussed below.

5.1 Fund performance

Much research about private equity funds, and buyout funds in particular, concerns their performance. Measuring funds' risk and return, and the extent to which it is "abnormal," is much more challenging than for other types of securities. To understand why, recall that any fund makes a relatively small number of investments (averaging around 10 per fund). If a fund makes 10 investments, then the fund's cash flows for its entire existence, usually lasting between 12 and 15 years, will consist of only 10 draw-downs from the LPs (as well as regular demands for management fees) and various distributions of cash flows back to the LPs when the portfolio firms are exited (depending on whether the exit is via a sale to another purchaser, or via a series of share sales following an IPO). In addition, there will sometimes be intermediate cash flows if portfolio firms pay dividends, which could be substantial if the portfolio firm is recapitalized. The key point, however, is that a private equity fund has a relatively small number of cash flows, which are spread over a long period of time. These cash flows tend to be skewed, with some deals losing capital but others being "home runs" and returning high multiples of invested capital.

These infrequent cash flows make an understanding of buyout fund returns much more difficult than the returns of more frequently traded assets. Several research questions follow from this issue. How does one assess whether the return of one fund, which consists of a small number of cash flows over a long time period, is sufficiently high to justify its risk? Moreover, can we tell whether the performance of the industry as a whole has been high enough to justify the enormous amount of capital that it has been committed to it? Finally, to what extent is past performance, either at the level of the GP or across GPs, relevant for predicting future performance, given that the environment is very different today than it has been historically, with many of the obvious buyout targets no longer available?

5.1.1 Measuring fund performance

Despite the drawbacks that are emphasized in introductory finance classes, the two most common measures of private equity performance are the internal rate of return (IRR), and the cash multiple of invested capital (multiple). Gompers et al. (2016) survey general partners, and find that over 90% rely primarily on these two measures. In addition, this survey suggests that GPs focus on absolute performance rather than risk-adjusted performance measures.

Although these measures are what practitioners most frequently use, they have several weaknesses. The multiples approach ignores many factors that investors should care about, such as the time an asset is held, interest rates, and the opportunity cost during the holding period—for instance reflected in the returns earned in public markets. IRR is a noisy measure of performance and its use can lead GPs to act against the best interest of their LPs. The IRR measure is usually distorted in a way where high IRRs are usually higher than the effective rate of returns and low IRRs are usually lower than the effective rate of returns (Phalippou, 2008). Focusing on IRR can lead to an exaggeration in measured performance and volatility, which could lead the managers to act in a way that conflicts with the LPs. Specifically, to boost the IRR, managers may terminate good investments too early when it is more favorable for the LPs to hold the investment longer at a lower rate. Or managers may engage in regular dividend recapitalizations, which result in short-term cash flows to investors—thereby boosting IRRs—but which have little impact on investment multiples (since debt is simply substituted for equity, leaving enterprise values unchanged).

A natural way to improve over IRR would be to adjust for market-wide movements and measure abnormal performance relative to a benchmark. Recently, the Direct Alpha approach developed by Gredil et al. (2014), which produces an annualized excess return, has gradually been adopted by some GPs and LPs, although conventions change very slowly in private equity. While IRR data is publicly available for most (but not all) funds, data on the magnitude and timing of cash flow distributions have historically been only available to the fund's investors. In recent years, however, cash flow data has become available through some data sources, in particular Burgiss (who also provide Direct Alpha measures of performance).

Using early cash flow data from Thomson VentureXpert (TVE), Kaplan and Schoar (2005) argued that investors should rely on a performance measure that values a fund's cash flow distributions relative to the returns on the public equity market (called the "Public Market Equivalent" or PME).[ac] A fund's PME is calculated as the discounted sum of cash flow distributions, where the discount factor is the return that an investor would have received over the same period in the public market, most commonly measured by the return on the S&P 500 over the same period. A PME equal to 1 represents the breakeven point where the fund's performance is equivalent to the performance of the public market, and PME higher or lower than 1 indicates the fund's outperformance or underperformance relative to the public equity market. This calculation implicitly assumes that the funds have betas equal to 1, which, as we discuss below, is probably lower than the funds' true betas.

Relying on this PME measure, studies have shown that there is a variation in performance of PE across different times and data sources. Kaplan and Schoar (2005) themselves, using TVE fund cash flow data from 1980 to 2001, found that

[ac]This measure was originally developed by Long and Nickels (1996).

the average PME for buyout is 0.97, which suggests a slight underperformance of PE relative to the public equity market. Using the same TVE data but a different approach to dealing with valuations of funds that had not been updated for several quarters, Phalippou and Gottschalg (2009) concluded that the performance of buyout funds was, net of estimated costs, around 3% lower than that of public markets. However, it was subsequently found by Stucke (2011) that the TVE data was biased downwards. The lack of updating of fund valuations in that dataset reflected the fact that the LPs and GPs had stopped responding to requests for data, rather than (as assumed by Phalippou and Gottschalg) that the valuations of the remaining companies were zero if they had not been updated for some while. As time went on, the IRRs on this stale data went down whereas on average the valuations employed by buyout funds of their remaining portfolio companies are, on average, conservative. Therefore, in reality, valuations tend to rise over the later years of a fund.

Academic research on private equity returns took a significant step forward with the formation of the Private Equity Research Consortium, which reached an agreement with Burgiss, a private markets data analytics firm, to make their data available, free of charge, to academics. The first authors to take advantage of this data are Harris et al. (2014) who analyzed the merits of the Burgiss data, which is derived entirely from LPs, relative to the other main data sources. Consistent with the finding of Stucke (2011), Harris et al. found the TVE data to be an outlier compared with the other data sources, and to be downward biased. Using the high-quality cash flow data from Burgiss et al. found that U.S. buyout funds had actually consistently outperformed public markets. The average PME of 1.22 implied that U.S. buyouts significantly outperformed the S&P500 over their sample period.

A number of other studies, using different samples, have come to similar conclusions. Higson and Stucke (2012) use a sample of 1169 buyout funds from Cambridge Associates between 1980 and 2008 and find that the median PME for these funds is 1.13. Axelson et al. (2013) estimate PME from publicly available databases and find a relatively high estimate (1.36). With a proprietary database from a single large LP for buyouts from 1984 to 2010, Robinson and Sensoy (2016) find a PME of 1.18. More recently, Harris et al. (2018) using the Burgiss fund-of-funds database from 1987 to 2007 report a PME of 1.14, reflecting the additional layer of fees associated with fund-of-funds. Although there are some variations in estimates, the above mentioned papers all conclude that the buyout funds outperform the public market during the 1990s and early 2000s. One exception is Phalippou (2014) who finds contrary evidence using small-cap indices as a public market benchmark, arguing that this benchmark is the appropriate one to use since the average buyout fund mainly invests in small and value companies. However, in recent years, small cap indices have significantly underperformed large cap ones, suggesting that this finding would no longer hold.

5.1.2 Adjusting for risk

While most studies found a PME for buyout funds >1, it is nonetheless unclear whether their returns can be considered abnormally high. Investing in a buyout fund involves taking on the additional risk coming from the high leverage that general

partners use to finance purchases of the portfolio companies, as well as the illiquidity associated with a long-term commitment of capital. It is difficult to know how much this risk and illiquidity should add to the required cost of capital. The methods for measuring risk commonly used for securities that trade continuously are not usable for private equity funds that have such few cash flow realizations, and which trade themselves infrequently—if at all—on the secondary market.

How does one adjust buyout returns for risk? How valid is the implicit assumption underlying the PME analysis that the buyout funds' betas equal 1? What about liquidity—do investors demand an illiquidity premium? How should one even think of estimating the risk of a fund for which the only data are the prices at which it buys and sells 10 companies over a 12- to 15-year period?

One possibility is to start with the notion, emphasized by Axelson et al. (2014), that the return on a buyout fund is simply the return on the portfolio firms, adjusted for the change in leverage brought on by the LBO. To use this approach to estimate a fund's risk, one would start with an estimate of the beta of the portfolio firm before it is acquired and apply the standard formula from Modigliani-Miller Proposition 2 to adjust for leverage.[ad]

Unfortunately, this calculation ignores several important considerations. First, the firms that tend to be targeted by buyout firms tend to be less risky than average, so their pre-buyout equity betas are probably lower than 1. Second, while 50% is lower than the typical buyout leverage ratio at the time of the deal, portfolio firms usually pay down some of their debt and increase their value while owned by the buyout funds. Therefore, the average leverage ratio over the entire period the portfolio firm is owned by the fund can be substantially less than the leverage at the time of purchase. Finally, the standard MM calculation assumes that the beta of the firm's debt equals zero. However, buyout debt is sufficiently risky that the beta of buyout debt is likely to be positive (see Kaplan and Stein (1990)). All of these factors will lead buyout betas to be less than the MM calculation would suggest.

There have been a number of studies that have used a variety of methods to estimate fund betas, as well as the alphas that are implied from these betas and the fund returns. Driessen et al. (2012) use the generalized method of moments to measure the alphas and betas by allowing dynamic discount rates. They find that buyout funds have betas of about 1.3 but no evidence of outperformance. In contrast, Ewens et al. (2013) use fund cash flow and NAV data from *Venture Expert* (VE), LP sources, and *Preqin* covering years from 1980 to 2007, and report the beta loadings to be 0.7 with a positive alpha of 1.2%. Using the three factor model, they report the alpha to be 0.9% which is still positive. Ang et al. (2018) construct a quarterly time series return indices using fund-level cash flow data from 1996 to 2015 and find that the market beta of buyouts is around 1.2 and the alpha is 4%. However, they report

[ad]According to the standard formula from Modigliani-Miller Proposition 2, beta of a levered firm is the weighted average of security betas (i.e., $\beta_L = \beta_E \frac{E}{E+D} + \beta_D \frac{D}{E+D}$). If the firm has a beta of 1 (as is definitionally true for an average firm) and one applies a 50% leverage ratio, then the implied beta should be about 2 under the assumption that the debt beta is 0.

that the alpha drops to 1% when they control for the Fama and French 3 factor model and −3% when they control for the Pástor and Stambaugh four factor model.

These studies estimate betas and alphas for the net of fee fund-level returns, which is what is relevant for LPs who invest in buyout funds. An alternative approach is to use deal level information to estimate the betas of each portfolio firm. Using the deal-level, gross-of-fee cash flow information for 2075 buyout deals that are managed by 250 funds from 1994 to 2007, Axelson et al. (2014) report a market beta of 2.4 and an alpha of 8.6%. The authors argue that using deal level rather than fund level data is a superior way to estimate funds' risk. They provide a simulation suggesting the source of discrepancy in beta loadings between previous studies and their study comes from the types of data being used. Moreover, Axelson et al. argue that using fund-level IRRs brings downward bias in beta estimation, whereas estimates using deal-level data are unbiased. Buchner and Stucke (2014) also report buyout performance gross of fees and show that the beta lies between 2.7 and 3.15 and alphas are around 5%. Similarly, Franzoni et al. (2012) use deal-level monthly cash flow data provided by the Center for Private Equity Research (CEPRES) and report positive alphas gross of fees after only controlling for the market risk.

Theoretically, gross of fee estimates of beta should be higher than net of fee estimates. Since carried interest tends to be higher when times are good, the fees themselves will have positive betas. Therefore, netting the fees from a fund's return will lower its beta. Axelson et al. (2014) argue that the difference between gross of fee betas and net of fee ones could be as high as 0.5, which could explain some of the difference between studies.

There have been other approaches to estimate alphas and betas for buyout funds. Jegadeesh et al. (2015) gather a sample of publicly traded private equity funds and estimate alphas and betas for these funds using methods that have become standard for the estimation of risk and return of public securities. These authors report betas of 0.7 and alphas close to zero. Boyer et al. (2021) use data on private equity secondary market transactions, and estimate alpha and beta based on this index. They find that the widely used NAV-based indices tend to significantly understate the volatility of PE and show that the transaction-based buyout index has a beta of around 1.75. Moreover, the transaction based hedonic indices show that buyouts do not outperform the public equity market on a risk-adjusted basis.

Another approach to evaluating risk in private equity funds has been proposed by Korteweg and Nagel (2016), who propose a generalized PME (GPME) that adjusts for firm risk. This approach is promising as it has the advantages of the PME approach while accounting for firm-level risk at the same time. Boyer et al. (2021) extend the Korteweg and Nagel method and show that, in the context of their index, it can be used to estimate time-varying risk-premia as well.

Overall, there is no consensus on the risk of private equity investments, and the extent to which they earn an excess return after adjusting for risk. As Axelson et al. (2014) point out, the disparity in the magnitude of beta and alpha across the literature can be affected by the types of data used in the analysis. For example, studies that use

NAV-based fund-level returns tend to report betas that are closer to the market and studies that use transaction-based or a deal-level cash flow data tend to report relatively high betas.

If transaction-based or deal-level data is more reflective of market values than NAV-based data and the PE performance does not outperform the public equity market when adjusting their risk, an interesting question concerns why PE investment is so popular even though their performance has not been great. Investors certainly need to consider the illiquid nature of the asset class, which even amplifies the question of why PE is becoming so popular. One of the possible explanations could be that leverage in buyouts is not as risky as in public firms so that the Modigliani and Miller calculation when estimating beta may not apply to buyouts. Moskowitz and Vissing-Jørgensen (2002) briefly discuss possible reasons why investors would invest in private equity despite high risk and low return characteristics. They argue that there could potentially be more tolerance in entrepreneurial risk, large non-pecuniary benefits, skewed preferences, and misperceptions of risk. It seems clear that more research needs to be done to resolve this puzzle.

5.1.3 Performance persistence

A fundamental issue in our understanding of delegated portfolio management is the extent to which good performance comes from luck, or if the managers of the portfolios have skill that enables them to perform persistently well. Investors' views about this issue guide their portfolio decisions, since it does not make sense to spend effort finding the best managers if fund performance does not vary with managers' abilities.

One way to address this issue is to measure the extent to which any measured performance persists over time. For mutual funds, the approach dates back to classic work by Jensen (1968), and after many papers, the answer is still somewhat inconclusive. Since there is no strong evidence that selecting mutual funds based on the perceived skill of fund managers leads to abnormal returns, many finance professionals advise their clients to invest in index funds and avoid trying to pay to select the best managers. However, the answer is much different for buyout funds—there does appear to be some evidence of performance persistence in private equity funds. The evidence suggests that GPs' skill varies, and consequently LPs are correct to spend effort selecting those they believe to be the best.

The first study to measure performance persistence in private equity is Kaplan and Schoar (2005), who find that high (and low) returns tend to persist over the subsequent funds raised by a particular PE family. Robinson and Sensoy (2016) confirm the Kaplan and Schoar (2005) finding, providing evidence for performance persistence using a larger sample of buyout funds. These papers suggest that GPs' skills do differ, so choosing GPs based on their past track record is likely to increase an LP's performance.

Recently, there have been several papers revisiting the issue of performance persistence in more detail using better data. These papers have been able to replicate the earlier findings; however, they find that the evidence became weaker after 2000.

Braun et al. (2017) employ deal-level cash flow data and find that although persistence still exists, it has become substantially weaker in recent years (2001–2012). The interesting innovation in this paper is the use of deal-level data. Clearly, as we have discussed, the performance of buyout funds takes a long time to realize, and so comparing the performance of two funds can span a period of two decades or more. Braun, Jenkinson and Stoff strip off the fund wrapper and look at persistence at the GP level across deals.

More recently, Harris et al. (2020) use cash flow data from Burgiss and look at fund-level persistence using traditional performance metrics and also the performance at the time that GPs were raising their next fund. This is an interesting lens through which to analyze persistence, as it represents the information that is available to LPs at the time at which they have to make commitments to future funds. While they find some persistence in buyout performance—when measured by the final, or most recent, fund valuations—the paper finds little evidence of investable persistence in buyouts. The relationship between the return at the time of fundraising, which is what investors observe, and the final performance of the next fund, is essentially random. Therefore, using this more accurate representation of the information available to investors, these authors find little evidence of return persistence for buyouts. They do find, however, much stronger evidence of persistence for VC funds, across all measures and time periods.

Particularly, when measuring performance persistence, separating skill from luck is a fundamental issue. For example, even though estimates from regressions tell us that top quartile funds tend to perform well in the next fund on average, this does not necessarily mean that an investor can choose any fund in the top quartile and can earn high returns. Past performance can be a noisy measure as it contains the luck element. Such noisy measures have less investable persistence as it is hard for LPs to identify whose past performance is due to luck or skill.

Several papers have examined performance persistence by focusing on the source of its variance. Using a variance decomposition model, Korteweg and Sorensen (2017) isolate fund variance into three components: long-term persistence, overlapping economic conditions, and idiosyncratic variance (i.e., luck). They find that luck explains a lower portion of buyout fund returns than venture capital returns, and that buyouts have higher long-term persistence. Rossi (2019) confirms the results of Korteweg and Sorensen (2017) and finds that persistence explains 5–15% of the performance variation. However, Rossi also finds evidence that PE fund returns are expected to mean revert in the future and that high-growth PE firms were on average lucky in the past. By this logic, high-growth follow-on funds should underperform their preceding funds even absent decreasing returns to scale.

Overall, the academic evidence suggests that the extent to which buyout funds have a persistent component in their performance is rather limited. Therefore, it is likely to be difficult for investors to identify the best funds using just statistical measures of performance. An LP's skill in determining the quality of GPs using other sources of information than just prior performance is a potentially important factor affecting the returns they achieve from their portfolio.

5.2 Limited partners

Investors in private equity funds (i.e., LPs) are usually institutional investors such as public or corporate pension funds, endowments, advisors (including fund-of-funds), insurance companies, banks, and finance companies. Consequently, LPs are also delegated managers for their own investors. In addition, LPs sometimes play a significant role in PE investments when they participate in co-investments or make direct investments themselves. There have been several recent papers that have studied the role of LPs, which we discuss in this section.

5.2.1 LP performance

LPs vary in terms of their organizational structure, investment objectives, and sophistication. Practitioners claim that there is substantial heterogeneity in LPs. Much of this heterogeneity occurs across different types of LPs, but there are also substantial differences in the resources and experience within LPs serving similar constituencies. For example, Swensen (2009) argues that endowments' higher flexibility enabled them to invest heavily into alternative assets like private equity well before most institutional investors. And within a class of investors such as endowments, the largest and most active investors tend to have the most resources available to identify and evaluate alternative funds.

One of the first papers that studied heterogeneity in performance across different types of LPs is Lerner et al. (2007). This paper examines 838 funds with vintage years between 1991 and 1998, in which 352 LPs invested. It finds that endowments earn an annual return of 21%, which is substantially larger than the returns earned by all other types of LPs. Sensoy et al. (2014) reexamine this idea using a larger sample covering more funds over a longer time period, with 14,830 investments by 1852 LPs during 1991–2006. They replicate Lerner et al. (2007)'s finding that for funds raised between 1991and 1998 endowments did indeed outperform other investors. However, as the industry matured and became more well understood and "commoditized," the difference across classes of LPs went away. In the early years of the industry, knowledge of how it worked was valuable and led to higher returns, but over time as this knowledge became common to all investors, these differences disappeared.

Cavagnaro et al. (2019) extend the analysis from classes of LPs to individual LPs and evaluate the extent to which individual LPs have skill in making investment decisions. These authors use data covering 30,915 investments made by 2314 LPs into private equity funds between 1991 and 2011. They use a bootstrap approach that simulates LPs' return distribution under the assumption that they are identically skilled and compare with the actual LP return distribution. Cavagnaro et al. (2019) find that compared to the bootstrapped distribution, the return distribution shows consistency in LPs' performance. Further, they extend the Bayesian approach of Korteweg and Sorensen (2017) and find that a standard deviation increase in skill leads to 1–2% increase in annual returns. The implication of these results is that LPs' skill does appear to affect returns to a meaningful degree.

While previous papers find evidence that difference in LPs' skill affects performance, the nature of LPs' objectives can also have an effect on their returns. Hochberg and Rauh (2013) explore investment patterns and investment performance of LPs over the period 1980–2009 and find that public pension funds tend to overweight their investment in in-state firms compared to other LP classes. However, these in-state investments earn lower returns than similar out-of-state investments. The paper further relates the overweight in in-state investments to political pressures facing public pension funds. Overall, their evidence suggests that political pressure can be costly, as it leads state pension funds to invest in local funds that earn lower returns than they could achieve absent political pressure.

Barber et al. (2021) find evidence that some investors do care about the nonfinancial role of private equity funds. The paper examines whether some investors are willing to accept lower returns for nonpecuniary benefits by investing in "impact funds," that supposedly invest in socially desirable companies. It considers a sample of 4659 funds, including 159 impact funds with vintage years from 1995 to 2014 and estimates the willingness to pay for impact across LP types. The paper finds that the IRR of impact funds is 4.7% lower than traditional funds. Using a hedonic pricing framework, the authors estimate that investors are willing to give away 2.5–3.7% of expected excess IRR for nonpecuniary objectives. In terms of heterogeneity of willingness to pay across LPs, they find that development organizations, financial institutions, and public pensions exhibit a positive willingness to pay.

One of the important aspects of LPs that could affect their performance, but has been underexplored in the literature, is their demand for liquidity. LPs' liquidity demand could affect the weight they place on liquidity, which could affect the LPs' returns (see Lerner and Schoar (2004)). We do not know much about the way in which LPs' preferences regarding liquidity affect their investments, especially the amount of capital they commit to private equity and their choices of funds.

Overall, the evidence suggests that some LPs consistently outperform others and that their skill accounts for a significant portion of their performance. Likely reasons for this disparity in performance are differences in skill, as well as political pressures to invest locally and in impact funds.

5.2.2 Direct investments and co-investments

Recently, there has been an increase in direct investments by institutional investors. These direct investments are sometimes initiated by the LPs themselves and sometimes take the form of co-investments in which the institution invests alongside a GP. Direct investing potentially allows institutions access to the private equity market without having to pay the substantial fees associated with investing through a fund. However, it is not obvious that the returns earned by direct investing are larger than the net of fee returns they would receive by investing through a fund. GPs have skills in negotiating investments and adding value to portfolio companies that are likely to be better than the abilities of most institutional investors. And co-investment opportunities potentially suffer from adverse selection in which GPs do not offer such

opportunities on their best deals, only their more marginal ones. Evaluating the extent to which these and related issues are empirically relevant has been the subject of some recent research.

Fang et al. (2015) consider these issues using proprietary data from seven large LPs involving 390 direct private equity investments made between 1991 and 2011. They find that most of the direct investments outperform the public market but that the outperformance is concentrated in buyouts rather than venture capital. However, compared to the corresponding funds with which they invest, buyout co-investments underperform while solo direct investments do well. The paper attributes the underperformance of co-investments to adverse selection of investments in which GPs only invite LPs to their more marginal deals.

Using a larger sample of 1016 co-investments made by 458 LPs between 1981 and 2010, Braun et al. (2020), in contrast to Fang et al. (2015), find no evidence of adverse selection in LP co-investments. They find that gross PMEs for co-investments are similar to the returns on deals from the corresponding fund that are intermediated by GPs. Moreover, they observe no differences in co-investment performance across LP classes and document that, because of lower fees and carried interest payments to GPs, co-investments outperform the corresponding fund, net of fees. As institutions' direct investing and co-investing increases in the future, this area is likely to see much more useful research.

5.3 Sources of returns

While the existence of return persistence and other tests suggest that GPs who are successful on average are more skillful than other GPs, the nature of these skills is not obvious. How exactly do GPs increase the value of their investments? There are many potential sources discussed above in detail in Section 3. Understanding the extent to which each potential source of value is empirically important has become an important area of research.

Jensen (1986, 1989) argues that a major source of the value created by buyouts is the substantial pecuniary incentives that GPs and top management teams have following buyouts. In addition, he argues that the high leverage of portfolio firms leads these firms not to waste the free cash flows that are generated by their operations. Jensen is an early proponent of the view that buyouts create their returns by increasing firms' efficiency. The alternative viewpoint, originally espoused by Shleifer and Summers (1988), is that much of the return buyouts generate occurs not from efficiency increases but from transfers from other stakeholders. This view argues that many of the gains from buyouts (and other takeovers) come from wealth transfers from workers, bondholders, and the government. Such two contrasting, but not necessarily mutually exclusive, views have led to much research about whether private equity funds do increase the values of portfolio companies. And if they do in fact increase value, how do they do it?

5.3.1 Value creation to portfolio companies

The earliest papers on buyouts focus on their value creation and find support for the view that the early buyouts in their sample do increase the value of the portfolio firms. Kaplan (1989a) documents that there are substantial increases in portfolio

companies' cash flow. These increases appear to come from improved incentives and not from reductions in employment. Smith (1990) finds positive operational returns that are not a result of a reduction in advertisement, R&D or increased layoffs. Lichtenberg and Siegel (1990) examine a large sample of manufacturing establishments of management buyouts in United States and conclude that there tends to be an increase in total factor productivity. Baker and Wruck (1989) conduct a case study of the O.M. Scott & Sons Company and show that the company's operational improvement was not due to a reduction in costs. They find an increase in R&D and Marketing & Advertisement investments after the acquisition.

These early studies have used samples that are relatively small, as they mostly focused on U.S. public-to-private deals. Subsequent research has extended the analysis to larger samples that exploit plant-level data or patent data to effectively capture the productivity or innovation of target firms. Davis et al. (2014) utilizes the Longitudinal Business Database that covers a large sample of buyout firm establishments. Their findings suggest that buyouts bring an increase in total factor productivity through efficiency improvements. GPs accelerate exits in less productive establishments and increase entries in more productive ones. Lerner et al. (2011) explore US patent data and find that patents are more likely to be cited post-buyout. Their result implies that there is no evidence of myopic management in buyouts. Using US deal-level proprietary data, Acharya et al. (2013) show that high abnormal returns of buyouts are attributed to improvement in sales and operating margins while target firms are private.

Outside the United States, Harris et al. (2005) find similar patterns using a manufacturing establishment database from the United Kingdom. Boucly et al. (2011) employ over 800 French LBO deals and show that target firms become more profitable relative to a control group. They find that buyouts help relax credit constraints and allow to take growth opportunities. Firms that are in industries that rely more on external financing experience larger growth.

Bernstein and Sheen (2016) focus on restaurant buyouts and identify the particular operational changes brought on by the buyouts. They find that restaurants become cleaner, safer, and better maintained after the buyout. The paper exploits the franchise structure of the restaurants as a clever way to identify the causality between PE buyout and improved maintenance. The authors compare the chain-owned restaurants to the franchisee-owned ones, where the groups of restaurants are similar to one another except for their ownership structure.

Several papers examine the way in which portfolio companies bought by buyouts perform during bad times. Johnston-Ross et al. (2021) examine the role of private equity during the 2008 Financial Crisis. They compare banks that were acquired by private equity and banks that were acquired by banks to measure the effect of PE intervention on these banks during the Crisis. Johnston-Ross et al. find that PE backed banks are less likely to go bankrupt and perform better during the Crisis period. The relatively good performance of these firms leads to faster recovery of the local economies in which they operate. Similar to Johnston-Ross et al. (2021), Bernstein et al. (2019) find that PE backed companies decreased investments less than their peers and had increased financings, higher asset growth, and increased

market share during the 2008 Crisis. These papers all provide evidence suggesting that private equity plays a positive role in helping firms survive economy-wide crises.

5.3.2 Wealth transfers

Critics of private equity often argue that rather than adding positive value to portfolio companies, GPs earn their returns by transferring wealth from stakeholders. There are a number of studies that suggest that such transfers are responsible for some of the returns earned by private equity funds. Guo et al. (2011) studies a sample of 192 buyouts completed between 1990 and 2006. The paper first shows that the risk adjusted returns to pre- (post-) buyouts are substantially high. They further explore the relative contributions to these returns. In contrast to the findings using 1980s samples, the median operating performance of buyouts is comparable to the performance of benchmark firms. Since operational improvements appear to be minimal, the inference from Guo et al. (2011) is that GPs earn returns by taking advantage of mispricing in the market, the tax advantages of debt, and by transferring wealth from employees.

Since many of the ways in which private equity funds can transfer wealth vary across industries, a number of studies have focused on samples of buyouts in individual industries. Gupta et al. (2021) examine the effects of PE ownership on patient welfare at nursing homes using administrative patient-level data. They find that a nursing home that is purchased by a private equity fund has an increase in the probability of death by 10%, and a decline in nursing availability and overall staffing. Furthermore, they find evidence of a systematic shift in operating costs away from patient care to non-patient care items like monitoring fees, lease payments, and interest payments. In contrast, Gandhi et al. (2020) evaluate the performance of private equity backed nursing homes during the COVID-19 pandemic and find that private equity ownership was associated with a decrease in the probability of confirmed cases and a lower probability of personal protective equipment shortages.

Eaton et al. (2020) studies the effect of PE ownership on for-profit higher education, using 88 private equity deals involving 994 schools. Similar to the findings of Gupta et al. (2021), this paper finds that the new ownership transfers wealth from students by increasing tuition but not the quality of education. After buyouts there are lower graduation rates, as well as lower loan repayment rates and earnings for the students who do graduate.

Overall, the literature has found evidence of both wealth creation and wealth transfers from buyouts. Buyouts appear to create substantial efficiencies on average. However, there is also evidence that some of these gains come at the expense of other stakeholders, in several different ways. The combination of the two effects is what generates the returns that limited partners receive from their investments in buyout funds.

5.4 Agency problems between GPs and LPs

There are two main governance relationships in private equity. First, funds invest in portfolio companies and must govern those companies. Second, the funds themselves are managed by general partners, who govern the fund on behalf of the limited partners and have a fiduciary duty to make decisions in their interests.

An important issue in delegated portfolio management literature is whether the contracts between managers and investors are optimally set so to align the interests of both parties. Since private equity investments require LPs' capital to be tied up for more than 10 years without any discretion on investment decisions, it is especially important that the contract is well designed to protect LPs' interests. Several studies have examined the nature of agency problems between GPs and LPs.

5.4.1 Agency conflicts from contracts

Axelson et al. (2009) provide a theoretical explanation of the PE fund structure, which they argue arises because of agency problems between GPs and LPs. In this model, the most efficient way to finance buyouts is through a structure that pools deals within funds and also requires funds to raise additional capital for each deal. Such a structure, together with strong incentives for managers, leads to a structure similar to what is observed in practice. It is second-best efficient, meaning that it is the best that can be achieved but still contains some inefficiencies. In certain circumstances, it will lead to value-increasing investments to be ignored while in others, value-decreasing investments will be undertaken.

Robinson and Sensoy (2013), Degeorge et al. (2016), Arcot et al. (2015), and Kim (2021) report findings consistent with the notion that contracts between GPs and LPs are designed to minimize agency costs. However, these contracts do not induce the first-best outcome. Robinson and Sensoy (2013) find that GPs distort the timing of distributions around the waterfall date so that they can receive carry and avoid the risk of investment declining in value. They also show that to earn management fees, GPs delay the liquidation of poorly performing deals. Similarly, Arcot et al. (2015) and Degeorge et al. (2016) find that funds that are under pressure to invest prior to the end of the investment period tend to engage more in secondary buyouts that end up underperforming. Kim (2021) studies how the 2 and 20 fee structure that has been widely adopted by buyout funds can in fact lead GPs to make investments that appear to be negative NPV and against the interest of LPs, presumably to maximize their GPs' fees. The pattern is more prominent among more experienced GPs who do not need to establish a reputation and funds that have earned high returns earlier that are likely to have already met LPs' return expectations.

5.4.2 Return manipulation

Another agency-related issue concerns the manipulation of valuations during fundraising. Since a fund's fees are a function of its size, GPs have incentives to increase the funds' size. Given that prior returns strongly affect LPs' commitments (see Chung et al. (2012)), increasing NAV prior to fund-raising could potentially increase reported performance and hence lead to larger capital commitments. The extent to which this practice occurs has been the topic of some interesting research.

Jenkinson et al. (2013) analyze 761 funds in which *Calpers* invested to evaluate whether funds tend to be aggressive or conservative in valuation and change their reporting behavior around the time of fund-raising. In addition, they measure the extent to which investors could rely on interim returns to predict final fund returns. Jenkinson et al. (2013) find that overall fund valuations are conservative and are

likely to be smoothed, except when GPs are raising their next fund. During the fundraising period there is an inflation in fund valuation and reported returns. Moreover, they show that interim returns are a poor predictor of funds' final performance.

Barber and Yasuda (2017) look at fund-level cash flows and quarterly NAV data for more than 800 US-focused funds raised between 1993 and 2009 to study whether PE firms tend to time their fundraising during valuation peaks of their current funds. They find that GPs do time the market and fundraise during the valuation peaks. While peaks during the fundraising period are clearer for funds that have high realizations, they also find evidence of peaks due to upward NAV reporting among low reputation GPs with few realizations. Moreover, markdowns of reported NAV are observed after fundraising among GPs with a low reputation. Brown et al. (2019) revisit the issue using a much larger and granular sample from *Burgiss* that includes daily cash flows and quarterly NAV reports of 2071 funds. These authors find that underperforming managers tend to inflate the reported returns, while outperforming one's report returns in a more conservative manner. However, they also find that those underperforming managers that inflate returns are less likely to raise a subsequent fund.

Several papers have documented the existence of agency conflict between GPs and LPs in buyouts. Given the long-term nature of the commitment and the number of decisions that are delegated to the GPs, some agency problems are inevitable. Contracts between GPs and LPs align their interests well as possible, but some residual conflict remains.

5.4.3 Emerging conflicts

The buyout model has evolved considerably over the years, and some issues we have identified are sufficiently new that they have yet to attract academic interest, or at least publications. One area that we highlight in this section on agency conflicts is the increasing prevalence of continuation vehicles, which we briefly discussed in Section 2.

To some extent, the emergence of continuation funds can be traced back to the limited life structure of buyout funds. Some assets may offer the prospect of generating attractive returns for many years under the private equity governance model, and yet GPs are expected to liquidate their funds after 10 years or so. Until recently, such companies often ended up being traded in a secondary transaction, in which the original fund sells the firm to a second fund. These transactions sometimes created issues for those LPs who were in funds run by both the selling and buying GPs: essentially, these LPs continued to hold the asset but had paid significant transactions fees and crystalized carried interest for the selling GP. However, the buyer and seller were distinct, so the negotiated price presumably was "fair."

However, conflicts of interest are much more likely in the case of continuation vehicles where the GP sells the company from the main fund into a continuation vehicle that it also manages, and in which not all of the original fund investors participate. Since being both a buyer and a seller on a transaction is a recipe for potential conflict (not to mention lawsuits) such transactions typically involve an

outside investor—often a secondary fund, or new investors who are not in the original fund—which helps to establish the price for the asset.

While the incentives to participate in a continuation vehicle, rather than exit and take the proceeds of the intermediate sale at that point, are often finely balanced, the incentives for the GP are much clearer. First, they will crystalize carry on the sale from the fund. However, investors will typically expect GPs to reinvest a significant proportion of their gains into the continuation vehicle. Second, the basis for the management fee will change. Recall that management fees are often based on invested capital in the second half of a fund's life. If an asset has grown significantly in value, then the fee basis will be written up in the continuation vehicle. For this reason, even though the management fee rates negotiated on continuation vehicles are often lower—say 1% rather than 2%—the increase in the fee basis will often more than compensate for this. Third, as noted earlier, increasingly the panacea for buyout funds is to grow management fees by expanding assets under management. Continuation vehicles play into this strategy very effectively, as the exit from the original fund can help to facilitate the raising of the GPs next fund while they continue to manage some of the original assets for much longer via continuation vehicles. Therefore, the move away from selling well-performing assets to other GPs can be seen as a natural way to expand fee income, albeit one beset with potential conflicts. This development is very recent, but future research will undoubtedly evaluate these funds' performance, as well as the way in which the conflicts of interest are managed.

6 Conclusion

The 20th century witnessed the growth of public capital markets, which allowed investors to participate in the growth of companies and resulted in the separation of ownership from control. Arguably, one of the remarkable developments in finance in the 21st century has been the growth of private capital markets, and the re-emergence of a close link between ownership and control. The value of a strong relation between ownership and control is an important reason for the enormous growth of the buyout industry in recent years.

Private capital markets typically operate through funds, which raise capital commitments and invest this capital in companies. The growth in private funds has been fueled by the huge growth in the size of key institutional investors, in particular those associated with public pension schemes, sovereign wealth funds and, increasingly, rich individuals. In recent years, private funds have raised commitments of about $1 trillion annually from such institutional investors, and currently have more than $2 trillion in "dry powder" that could be invested at the discretion of the funds' General Partners. While these funds use the capital for different types of investments, the largest amount is raised for buyouts of existing companies, approximately $400 billion annually. This paper attempts to understand the buyout market and the reasons why it has grown to become such an important part of the economy.

Investors provide capital to buyout funds when their expectations are that the funds' returns will be sufficiently high to offset their risk, illiquidity and the

significant fees and profit shares charged by the fund managers. To earn these returns, buyout funds acquire portfolio companies, manage them for a period of time, then exit their position and return investors' capital. Almost all deals involve substantial increases in leverage that sharpen incentives and amplify—in both directions—the returns to the funds' equity investments. The change in the value of the portfolio companies comes mostly from improvements in the performance of the portfolio firms that are acquired and then sold by the buyout funds. However, part of any value increase can come from transfers from others, in particular tax authorities who may receive lower corporate tax payments as a result of the increased use of interest tax shields on debt. The ability of buyout funds to improve the value of their portfolio firms is the primary factor affecting their returns, and consequently the flow of capital into the buyout sector.

Underlying buyout funds are a complex set of contracts that have evolved over time and have become fairly standardized across funds. The two most important of these are the contract between the investors and the funds and the contract between the funds and the portfolio companies. As the companies that manage private funds have grown and raised multiple funds that often spread into different geographies or asset classes, contracts linking these management companies and the individual funds they manage have been developed. These contracts are designed to ensure that all parties have strong pecuniary incentives to increase the value of the portfolio companies and consequently, the returns of the funds themselves. However, as funds become very large, the alignment of interest between investors and fund managers can weaken, as management fees—which have been surprisingly sticky as funds have increased in size—have become a significant source of profit for fund managers. Furthermore, as the sector has matured, the ultimate owners of the fund management company have sold off stakes to outside investors, and some private equity managers have even gone public. All these developments reduce the alignment of interests between fund managers and their investors. Section 2 describes these contracts and the institutional environment of buyout funds in detail.

There are many strategies that funds have developed for increasing the values of their portfolio companies. The iconic deals of the 1980s were predominately acquisitions of firms with cash-generating assets for which additional leverage would reduce wasteful spending of their free cash flows. Over time, however, several other approaches have become common. Expansions, industry consolidations, ownership transitions, privatizations of public enterprises, and acquisitions of distressed assets are among the growing number of strategies that have become popular with buyout funds.

Private equity funds have proved to be a remarkably efficient vehicle for enacting many types of changes in portfolio firms. Their general partners are highly motivated to think of new ways to increase firms' values and have been extremely creative in coming up with new ways to do so. As a result, there is no one magic formula that characterizes what buyout funds do to generate returns. There is every reason to suspect that funds will continue to develop new approaches to increasing the values of their portfolio companies, so that the list of strategies presented in Table 1 will look very incomplete in the future.

Academic research on buyouts has been active over recent years. Yet, there is much more research to be done. The study of buyouts is interdisciplinary, covering both of the main fields within financial economics (asset pricing and corporate finance), but also relating to labor economics, industrial organization, management, and accounting. The buyout sector has become an important asset class to institutional investors. However, it is not obvious what the appropriate weight buyouts should take in well-diversified portfolios, nor is it clear what are the risk, expected returns or liquidity premia associated with buyout funds. Understanding the source of these returns, and the way they are the consequence of changes in the corporate policies of the portfolio firms has been an important area of research.

Some of the important policy changes buyout funds enact in their portfolio firms relate to corporate financial decisions, choice of top management and their compensation, and corporate strategy, their competitive strategies, and their methods of production. An underlying issue in much of this research is whether the gains come from wealth creation or wealth transfers. The answer to this question will impact perceptions on the role of buyouts in the economy.

There has been much work devoted to understanding the financial structure of public corporations. Portfolio companies of buyout funds can be understood using many of the principles that have been developed for public corporations. However, the frictions that make public corporations and markets interesting to study—asymmetric information, agency problems, illiquidity, etc.—are all much more problematic in private markets than in public ones. Therefore, there is much to be learned about private firms and markets using tools that have been developed in the literature. Given the current size and growth rates of private capital markets, research along these lines is likely to be fruitful. Private capital markets have become at least as important, and far more interesting to study, than public capital markets.

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