IMPACT OF PRIVATE EQUITY

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Abstract

We survey the academic literature about the impact of private equity investments in the broader economy. Private equity fund managers respond to high-powered incentives and seek to maximize shareholder values via a variety of channels. The literature identifies two broad approaches to value creation taken by private equity funds with sharply divergent outcomes for stakeholders and the aggregate economy. The first approach, associated with public-to-private deals, exploits leverage and interest tax shields, cost reduction, and operating margin improvement. The second approach, associated with private-to-private deals, targets growth-oriented and capital-constrained companies and adds value by relaxing financing constraint, imparting operational and managerial expertise, increasing investment, and inducing top-line revenue growth. Innovation tends to increase with the latter approach (private-to-private deals) while it either declines relatively or becomes more narrowly focused with the former approach (public-to-private deals). For employees, post-buyout high-skilled workers tend to benefit from increased IT investments and upskilling in the jobs, whereas low-skilled workers tend to be hurt from automation and job cuts. For consumers, private-to-private deals imply greater variety and broader geographic availability of products, whereas public-to-private deals imply higher prices and reduced availability. In regulated or subsidized industries, distortion in incentives given by the regulatory framework tends to get magnified when combined with high-powered incentives of private equity. The literature provides evidence of this in healthcare, for-profit education, insurance, and the fracking industry. Collectively, the emerging evidence suggests that welfare outcomes for the broader environment and society depend sharply on the regulatory and competitive structures within which the private equity portfolio companies operate. Thus, regulators need to consider the impact of the high-powered incentives of private equity when assessing the market impact of a given regulatory policy or decision. Finally, impact funds are posited as a mechanism for explicitly aligning the shareholder preferences with the broader public interest. Impact fund investors derive utility from holding impact funds that generate positive impact, and thus are rationally willing to invest in them even though their expected financial return alone may be lower than that from investing in non-impact private equity funds. The result is consistent with the theory of sustainable investing in equilibrium with explicitly pro-ESG investors. Suggestions for future research are discussed.

Keywords: Private equity; leveraged buyout; stakeholders; sustainable investing; impact investing

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1. INTRODUCTION

Private equity investments are growing, as documented extensively elsewhere in this volume. A major form of private equity is buyouts, also known as leveraged buyouts (LBOs), where private equity funds, also known as buyout funds, acquire majority equity stakes in portfolio companies using large amounts of debt financing. Buyout funds are active investors, and they are intimately involved with and exert substantial control over the portfolio companies they acquire. In fact, it is reasonable to consider private equity ownership as a separate corporate governance form—distinct from, for example, being a publicly-traded or a family-owned business. There is now a substantial body of academic literature that investigates the impact on and implications of this governance form for (i) the portfolio company itself (including its management), (ii) employees and other stakeholders, and (iii) the broader society, including consumers, governments, the environment, and the industry. This chapter summarizes this literature and its main findings. We further review the nascent literature on impact funds—a type of dual-objective private equity fund—and frame its findings within the rapidly-growing literature on the environmental, social and governance (ESG) and sustainable investing.

Existing Surveys

In addition to the other chapters in this volume, there are a few other academic surveys of private equity. Brown, Harris, Jenkinson, Kaplan, and Robinson (2020) provide a historical perspective of the development of the private equity industry and its performance. Kaplan and Strömberg (2009) describe the organization of private equity firms and their effects on the operations of portfolio companies. Metrick and Yasuda (2011) highlight the importance of private ownership, and the information asymmetry and illiquidity associated with private ownership, as a key explanatory factor of what makes private equity different from other asset classes.

In contrast to these other surveys, this survey focuses on the impact of private equity ownership on the broader society and aims to shed light on critical market, industry, and regulatory factors that determine when the impact of private equity ownership is positive or negative, and for whom. A key insight is that there is an inherent ambiguity in the sign of the relationship between private equity ownership and the societal impact of the firm's activities when the private equity fund managers do not internalize those societal impacts in their objective functions.

Early studies

The modern version of buyouts dates back to the 1980s. The seminal acquisition of RJR Nabisco by Kohlberg, Kravis, and Roberts & Co, vividly described in the book "Barbarians at the Gate" (Burrough and Helyar 1990) took place in 1988. Early studies focused on analyzing the impact of private equity ownership on shareholders. Kaplan (1989a) analyzes data for 76 buyouts (LBOs and management buyouts) and documents that these transactions were followed by significant increases in operating margins and cash flows for the involved portfolio companies, both measured in absolute terms and relative to similar public companies. In another early study, Lichtenberg and Siegel (1990) find that the total factor productivity (TFP) increases for U.S. manufacturing companies that were acquired in buyouts. While recent studies add nuance and depth to our understanding of private equity transactions, the general conclusion that private equity transactions on average create value for, or at least do not harm, shareholders of portfolio companies emerged during this period and remains unchallenged.

Traditional Dichotomy: Jensen (1989) versus Shleifer and Summers (1988)

Discussions of the impact of buyout transactions are often framed as a horse race between Shleifer and Summers (1988) and Jensen (1989). Jensen (1989) emphasizes efficiency gains from private equity transactions. In particular, he argues that public companies suffer from agency problems due to free cash flows, and that private equity ownership with increased leverage can mitigate this problem and both improve social welfare and create gains for shareholders. While he recognizes the possibility of shareholder gains being offset by losses to other financial constituencies (e.g., bondholders) and stakeholders (e.g., employees), he argues that these losses are smaller and short-term compared to the efficiency gains that are long-term, such that takeovers are socially desirable.

In contrast, Shleifer and Summers (1988) emphasize that returns from private equity can often result from transfers from stakeholders, such as employees and suppliers, and not from efficiency gains. Thus, private equity gains need not equate social welfare gains. By the same token, worker layoffs need not equate social welfare loss, though the authors point out that "the redistribution is probably antiegalitarian." (p. 35)

In addition, Shleifer and Summers (1988) note that there are potential negative spillover effects from buyouts, such as the decline of the local economy after factory closures. They propose a particular mechanism of efficiency loss due to breach of implicit contracts. These negative spillover effects could result in overall social welfare loss and make private equity socially undesirable.

While Shleifer and Summers (1988) conjecture that the negative impact of private equity dominates and propose a particular theory of breach of implicit contracts, they do not conduct systematic empirical studies to measure the actual impact. Likewise, although Jensen (1986, 1989) conjectures that the positive impact of private equity dominates and posits that private equity solves a particular agency problem due to free cash flows, he does not conduct systematic empirical analysis to isolate this channel relative to other mechanisms.

In practice, both the positive and negative impacts of private equity can be present in a given transaction. Magnitudes of either effect can vary; as a result, the observed shareholder gains can be consistent with (i) efficiency gains alone, (ii) wealth transfers alone, or (iii) both efficiency gains and wealth transfers. Furthermore, each of these cases may or may not be accompanied by negative externality effects on the broader economy. Empirical findings of efficiency gains – often perceived to be in support of Jensen's arguments – do not necessarily reject Shleifer and Summers' concerns about shareholder gains due to transfers, and likewise, findings of employment loss – often perceived to be in support of Shleifer and Summers' arguments – do not necessarily reject Jensen's theory about efficiency gains. Therefore, instead of testing these hypotheses against each other in a horserace as if they are mutually exclusive, it is more informative to investigate the magnitudes and prevalence of the two effects, while allowing them to be simultaneously present.

One insight that has collectively emerged in the literature in the last three decades is that the pre-deal ownership type matters. Formerly-publicly-traded companies that get acquired by private equity firms (public-to-private deals) undergo systematically different transformations than formerly-privately-owned companies (private-to-private deals), with differential impact on the stakeholders and the broader society. Wealth transfers appear more predominant in public-to-private deals, whereas productivity gains and growth are associated more with private-to-private deals. Interestingly, private-to-private deals are typically less leveraged and more growth-oriented, and thus neither fit the inefficiently-run, cash-cow target architype that Jensen identified, nor are explained by the breach of implicit contracts à la Shleifer and Summers. This heterogeneity in value-generating mechanisms and outcomes underscores the limitation of any sweeping generalization about the social impact of private equity ownership/governance.

2. INCENTIVES IN PRIVATE EQUITY

There are several excellent descriptions of the organization and structure of private equity firms, including in the other chapters of this volume. To establish the terminology and economic relations for our discussion, we review a few central features below, but this is not meant as a comprehensive overview.

A private equity firm manages one or more funds. Each fund raises capital from a group of limited partners (LPs), typically pension funds and other institutional investors. The firm serves as the general partner (GP) of the fund, which is typically organized as a ten-year limited partnership. The fund uses the capital to acquire private assets, and the fund's type is determined by the nature of these assets. Two common types of private equity funds are venture capital funds that acquire equity stakes in young start-ups and buyout funds that acquire equity stakes in more mature companies.

Note that the term "private equity" is sometimes used to refer to either (i) the entire private equity asset class encompassing venture capital, growth, buyout, and distress investing, and (ii) buyout investing alone, which is the largest category of private equity in terms of assets under management. In this chapter we focus mostly on the literature that studies buyout funds and their portfolio companies, except when we discuss impact funds, where most funds raised early in this category (and thus studied in the academic literature) were venture capital funds and buyout impact funds came into existence only in the last few years as of the writing of the chapter.

The day-to-day operations of a fund are managed by its general partner. The general partner decides which companies to acquire, how to manage these acquired portfolio companies, and when and how to sell them again. The general partner also decides when to raise follow-on funds and manages this fundraising process. In return, the general partner receives management fees and carried interest. Management fees are charged by the general partner for managing the limited partners' capital and they are around 2% annually of the fund's total committed capital. Carried interest is the general partner's profit share, which is typically 20% of the fund's overall profits.

2.1 Incentives for maximizing deal profits

Consider, in isolation, a single deal where a buyout fund acquires a portfolio company. The private equity structure provides the general partner with strong incentives for maximizing the profits from this deal. The general partner typically receives carried interest of 20% of the fund's profits, although this does not necessarily mean that the general partner's marginal benefit of increasing the profit from the deal by one dollar is exactly twenty cents, due to complications such as the fund being underwater due to losses in other deals, hurdle rates, and catch-up provisions. These complications are second-order, though, and in most situations the general partner has strong incentives to maximize the profits generated in each deal.

An analytical framework, known as the buyout model, is useful for illustrating the implications of these incentives. In this framework, a buyout fund purchases a portfolio company

with enterprise value EV_0 and excess cash EC_0. The enterprise value, EV_0, is the economic value of the company's ongoing business, which is typically the present value of its future free cash flows. Excess cash, EC_0, is the cash available to the company that exceeds the cash needed to sustain its ongoing operations. The zero subscripts indicate that these amounts are dated at the time just after the private equity fund acquires the company. The sum of the enterprise value and the excess cash is the company's total value, and it typically equals the combined value of the company's equity and debt.

The buyout fund finances the acquisition with debt, D_0, and equity, E_0:

$$EV_0 + EC_0 = D_0 + E_0 \quad (1)$$

The debt, D_0, is the portfolio's company's debt just after the closing of the private equity transaction, which is often substantially larger than the company's debt before the transaction, meaning that the private equity fund pays some of the acquisition price by taking on new debt in the portfolio company. Economically, this is analogous to a home buyer financing part of the purchase of a house by taking out a mortgage. The equity, E_0, is the remaining part of the purchase price, which is paid by the private equity fund, and this is also the initial value of the private equity fund's equity stake in the portfolio company.

A similar relationship holds at the time of the exit when the portfolio company is sold by the private equity fund. Using subscript one to denote the values at the time of this sale, the price of the equity, E_1, reflects the company's updated enterprise value, excess cash, and debt at the time of the exit. It holds that:

$$EV_1 + EC_1 = D_1 + E_1 \quad (2)$$

The fund's profit (or loss) from the deal, denoted P, derives from the change in the value of the fund's equity. This change is:

$$P = E_1 - E_0 = (EV_1 - EV_0) + (EC_1 - EC_0) - (D_1 - D_0) \quad (3)$$

The right-hand side of this expression shows that the profit from a private equity deal consists of three components. It arises from an increase in the enterprise value of the portfolio company, $EV_1 - EV_0$, corresponding to an increase in its economic value. It arises from the excess cash accumulated by the portfolio company during the holding period, $EC_1 - EC_0$. And it arises from the reduction in the portfolio company's debt during the holding period, $D_1 - D_0$.

One implication of this framework is that an immediate way for a private equity fund to increase the profits from a deal is to increase the portfolio company's enterprise value, i.e., increase its economic value as perceived by the acquirer in the future exit. Indeed, a survey of private equity firms by Gompers, Kaplan, and Mukharlyamov (2016) reports that these firms place a heavy emphasis on adding value to their portfolio companies. The sources of added value, in order of importance, are increasing revenue, improving incentives and governance, facilitating a high-value exit or sale, making additional acquisitions, replacing management, and reducing costs. All of these sources directly serve to increase the portfolio company's enterprise value at the time of the exit.

The framework also shows the limits to how private equity funds can create profits in a deal. For example, an increase in the amount of leverage used to finance a deal does not mechanically increase the dollar amount of profits from the deal. An increase in leverage typically increases both D_0 and D_1, by largely similar amounts, so the effect mostly cancels out in the last term of the framework (the increases in the amounts may not exactly offset since, for example, an increase in initial leverage increases interest payments during the holding period, which may reduce either excess cash or limit the portfolio company's debt repayment over the holding period; these effects, however, are largely second order).

However, by making the cost basis of equity investment E_0 smaller for a given dollar amount of profit, an increase in the initial leverage does tend to increase the *return* on the equity investment, while also making it riskier.[1] Interest tax shields generated from higher leverage also contribute to increasing the enterprise value of the firm, ceteris paribus. Gompers, Kaplan, and Mukharlyamov (2016) find that two-thirds of private equity investor survey respondents say they raise as much debt as the market will bear and that limited partners in private equity funds focus more on absolute performance as opposed to risk-adjusted returns.

As another example of the economics of a deal, a portfolio company can pay a special dividend to the fund. Such a dividend would be paid out of the portfolio company's excess cash, and it would thus reduce the price at which the portfolio company is sold in a future exit. In the

[1] Suppose $EV_0 = 100$, $EC_0 = 10$, $EV_1 = 120$, and $EC_1 = 10$. In a low-leverage case, suppose $D_{L0} = D_{L1} = 50$; it implies that $E_{L0} = 100 + 10 - 50 = 60$ and $E_{L1} = 120 + 10 - 50 = 80$, so the return on equity investment is $(E_{L1}/E_{L0}) - 1 =$ is $(80/60) - 1 = 33\%$. In contrast, in a high leverage case, suppose $D_{H0} = D_{H1} = 100$; it implies that $E_{H0} = 100 + 10 - 5 = 100 = 10$ and $E_{H1} = 120 + 10 - 100 = 30$, so the return on equity investment is $(E_{H1}/E_{H0}) - 1 =$ is $(30/10) - 1 = 200\%$.

framework, a special divided is offset by a corresponding reduction in the excess cash, leaving the fund's profits from the deal largely unchanged (again, the changes may not be exactly similar, and the profits may not be exactly unchanged, due to changes in interest payments and other similar effects).

Other considerations may influence the fund's decision to pay a dividend. For example, a special divided could allow the private equity fund to return capital to its limited partners earlier, which can increase the fund's internal rate of return (IRR) even if the dollar amount of profits remains largely unchanged. This effect would encourage funds to pay special dividends.

Alternatively, the reduction in the portfolio company's excess cash following a special dividend may affect the portfolio company's operations. If the portfolio company suffers from being liquidity constrained it would reduce its enterprise value. The fund only benefits from the dividend, but it suffers both from the reduction in excess cash, which is as large as the dividend, plus the loss arising from the decrease in the portfolio company's enterprise value, and a dividend that negatively affects the portfolio company's operations would therefore normally reduce the fund's overall profits from the deal. Hence, this effect would discourage funds from paying special dividends. In their investigation of corporate tax filings from leveraged buyouts during 2005 to 2009, Cohn, Mills, and Towery (2014) find that portfolio companies only make limited dividend payments, and they find no evidence that private equity firms "strip" value from otherwise healthy portfolio companies.

2.2 Incentives of a fund, deal flow

The above discussion considered the profits from a single deal. However, a fund typically invests in several deals, with 10-15 deals being normal numbers. The general partner's carried interest typically depends on the fund's aggregate profit across all deals net of management fees, where management fees are the total amount paid to the general partner during the lifetime of the fund:

$$\textit{Fund Profits} = \Sigma_d P_d - \textit{Management Fees}. \quad (5)$$

Deals are indexed by d, and P_d is the profits from deal d, as defined above. Management fees are specified contractually at the inception of a fund and are independent of the fund's performance. However, since management fees come out of the fund's committed capital, larger management fees will reduce the amount of capital available for investing in portfolio companies. Existing research finds that as much as two thirds of the present value of the general partner's compensation comes from management fees (Metrick and Yasuda 2010).

To maximize carried interest, holding the set of deals constant, the general partner would simply maximize the profits in each deal. However, holding the set of deals constant is not a trivial assumption. Private equity firms are concerned about their ability to identify and invest in attractive deals, but that may require maintaining a certain reputation to be able to access this "deal flow." Hence, even pure profit maximization at the fund level means that the private equity firm must be mindful about how its actions in a given deal affect the firm's reputation and ability to invest in other attractive deals. It is not inconsistent with profit maximization that a private equity firm leaves money on the table in a specific deal to maintain a reputation as a reasonable investor that other potential portfolio companies would want to work with in future deals. This reputational concern, for example, may induce a private equity owner to incur costs to maintain more stringent regulatory compliance standards in sectors where the framework is transparent and well-enforced than non-private equity owners. On the other hand, the same private equity owner may reverse its policy once the regulation is rolled back.

2.3 Incentives of private equity firms, raising future funds

Private equity firms typically manage a series of funds. The general partner's ultimate incentives arise from its concern about its aggregate management fees and carried interest across all its funds. Holding the set of funds constant, a general partner maximizes the aggregate compensation it receives by maximizing the combination of management fees and fund profits, as defined in Equation (5) for each fund. However, holding the set of funds constant is again not a trivial assumption. The aggregate compensation is:

$$\textit{Firm Revenue} = \Sigma_f \left[h_f(\textit{Fund Profits}_f) + \text{Management fees}_f \right] \qquad (6)$$

The function h_f captures the private equity firm's profit share for each fund, indexed by f. This function is weakly increasing in the fund profits, and a simple version of this function is $h_f(p) = \max(0, 20\% \; p)$, although this function can be more complex due to hurdle rates, catch-up provisions, and other features of the fund's "waterfall." Importantly, however, the sum is over both current and future funds, and Chung, Sensoy, Stern, and Weisbach (2012) argue that about half of a private equity firms' incentive pay arises from the effects of its current fund performance on its ability to raise future, typically larger, funds, which generate management fees and carried interest. The other half comes from carried interest earned on the current fund. Metrick and Yasuda (2010) and Chung, Sensoy, Stern, and Weisbach (2012) find that successful buyout fund managers increase their pay by scaling up the size of future funds rather than by increasing their compensation per dollar managed. The capital for these funds is provided by limited partners, which are typically institutional investors, such as pension funds, university endowments, and

sovereign wealth funds. Hence, another concern for a private equity firm is whether the firm's investments and actions are consistent with the preferences and priorities of the limited partners and whether these investments and actions promote the private equity firm's future fundraising.

To summarize the above discussion, the incentives facing private equity firms and the general partners managing their funds are more complex than they may immediately appear. It may be natural to think that the large profit share—in the form of a 20% carried interest—simply means that private equity investors only maximize short-term profits in each deal above all else. However, the private equity organizational form creates more complex incentives for the private equity investors. First, a private equity fund only profits when a portfolio company is sold in an exit, and the sales price depends on the portfolio company's future economic viability. Hence, it is unlikely that extracting short-term profits at the expense of long-term viability is a significant source of profits for private equity funds. Second, a substantial part of a private equity firm's business hinges on its ability to make future investments in companies. Therefore, private equity firms may be concerned about maintaining a reputation for being reasonable investors even if this means leaving money on the table in a specific deal. Third, the private equity firm's ability to raise future and larger funds and earn both management fees and carried interest from those funds, hinges on the firm acting according to the preferences and priorities of limited partners. How these various trade-offs are resolved in practice is an empirical question.

2.4 Growth of Environmental, Social, and Governance (ESG) Investing and Private Equity

In recent years, an increasing share of limited partners who invest in private equity funds have integrated environmental, social, and governance (ESG) issues into their investment analysis. As a sign of increasing demand for ESG-conscious investment practices, as of March 2020, 3,038 organizations representing $103.4 trillion in asset under management have become signatories to the United Nations Principles of Responsible Investment (UNPRI). These principles state that the signatories commit to "[i]ncorporate ESG issues into investment analysis," "[i]ncorporate ESG issues into our ownership policies and practices," and "[s]eek appropriate disclosure on ESG issues by the entities in which we invest."

There are two distinct motivations behind investors' push to incorporate ESG issues into their investment analysis. One is based on materiality, or the idea that the ESG practice of business has material impacts on their future financial performance, and therefore it is within the realm of asset managers' fiduciary duty to the beneficiary of its financial assets to incorporate ESG-related information into its investment analysis. Under this branch of responsible investment, the goal is still wealth maximization, but ESG issues are value-relevant and therefore should be disclosed and

monitored just like other material information. This materiality-based motivation is consistent with U.S. fiduciary investors' recent push to incorporate ESG into their investment practice.

The other motivation is based on impact investing, or the idea that limited partners enjoy non-pecuniary benefits from generating positive externalities via their investments. This type of responsible investment is called dual-objective or double-bottom line because investors explicitly seek to generate both financial returns and positive societal impact at the same time. Indeed, 88% of UNPRI signatories are either investment managers or asset owners, and the UNPRI states that incorporation of ESG issues both fulfills the signatory's fiduciary duty as institutional investors, and also "may align investors with broader objectives of society." Notably, European fiduciary investors are permitted (and even required) to take into consideration broader social and public interests when screening their investments, while U.S. fiduciary investors are under strict regulatory guidelines to consider only the financial impact of investment decisions (or consider non-financial impact only when it is guaranteed not to lower financial return). This explains to a large degree the difference in expressed preferences and priorities of American. vs. European investors towards ESG and sustainable investments.

While European institutional investors have been quicker to integrate ESG issues into their investment process, in the last several years the pace of adoption has accelerated even among the American institutional investors. For example, in his influential annual letter to the CEOs of the largest corporations, the BlackRock CEO Larry Fink wrote: "[A] company cannot achieve long-term profits without embracing purpose and considering the needs of a broad range of stakeholders" (Fink 2020) and "with the world undergoing the largest transfer of wealth in history: $24 trillion from baby boomers to millennials. As wealth shifts and investing preferences change, environmental, social, and governance issues will be increasingly material to corporate valuations." (Fink 2019) Also, climate risk is increasingly seen as an investment risk, endangering sustainability of investment portfolios. In response, major asset managers and asset owners around the world have started planning for transitions to net-zero portfolios, or portfolios with net-zero greenhouse gas emissions.

Pedersen, Fitzgibbons, and Pomorski (2021) build an ESG-adjusted capital asset pricing model in which three types of investors differ in their preferences and information sets with respect to assets' ESG characteristics, and their respective portfolio decisions affect equilibrium asset prices and returns. Pro-ESG investors derive utility from holding high-ESG score assets. ESG-aware investors use firms' ESG scores to update their views on risk and expected returns. ESG-unaware investors are unaware and therefore ignore ESG scores. In the model, ESG-aware investors may get superior outcomes when ESG scores convey value-relevant information. This

insight suggests that materiality of ESG information may drive limited partner demand for ESG disclosures by private equity funds, even if they are not pro-ESG investors.

Given this accelerating shift in investors' preferences for ESG incorporation, general partners in private equity firms are responding by committing to greater ESG disclosures and in some cases raising impact funds that explicitly target generation of positive externalities. Indeed, Preqin reports that "[s]ince 2011, more than 4,400 ESG-committed private capital funds have closed, totaling $3.06tn in combined assets" (Preqin 2020). This is consistent with the incentives of general partners to maximize their ability to raise future funds by catering to the preferences of their limited partners.

3. PRIVATE EQUITY MANAGEMENT MODEL

As described in Section 2, private equity funds use a contractual format of finite-life, closed-end limited partnerships that provide general partners with a particular set of incentives and access to their portfolio companies. What does this imply about the effect of private equity ownership on the shareholders, other companies' stakeholders, and society at large? The literature has mostly focused on analyzing the principal-agent problem between portfolio company shareholders and their managers, and how the private equity model purports to solve this agency problem better than public companies can solve it (Jensen 1989). In contrast, the effect of the private equity management model on portfolio company stakeholders and other parties in the society at large is underexplored. In this section we (i) review the proposed private equity solution to the principal-agent problem, (ii) posit the private equity model as a potential solution to the ESG monitoring problem of responsible investors, and (iii) point out the ambiguity of the relationship between private equity ownership and the impact on stakeholders.

3.1 Principal-Agent Problems in Public Corporations

The literature has identified three ways in which managers of public corporations may behave in value-destroying manners from shareholders' point of view. First, Jensen (1986, 1989) argues that when managers have too much discretion over how to spend any free cash flows of the company they manage, they tend to engage in empire building by investing in projects with negative net present value (NPV) to increase the managers' spheres of influence, and/or to consume private benefits. Second, Bertrand and Mullainathan (2003) find that, when public company managers are shielded from takeovers by state laws, they invest less, pay higher wages to themselves and their peers, and enjoy the quiet life, to the detriment of profitability and productivity of the companies. Finally, while public investors scrutinize hard information such as quarterly earnings and stock

returns, they face free-riding problems and lack incentives to produce soft information about a manager's efforts, ability and quality. Subsequently, this narrow focus on quarterly earnings and share prices by public market investors leads to short-termism by company managers, which in turn destroys shareholder values by distracting the managers from long-term strategic thinking and investment horizons (see Bebchuk and Weisbach 2010 for a survey). Moreover, all three of the agency problems are exacerbated when boards are captured by insiders. Both regulators and firms themselves propose using independent directors as a remedy for these agency problems, and the literature documents some benefits associated with independence of directors (e.g., Chhaochharia and Grinstein, 2006). However, independent directors' effectiveness as monitors depends on their own incentives, and thus can be diminished due to lack of information access, busy-ness, or both (see Bebchuk, Grinstein, and Peyer 2010 and Fich and Shivdasani 2012).

3.2 Posited Solutions with Private Equity Management Model 1.0: Traditional View

Kaplan and Stromberg (2009) identify three value-creating activities associated with the private equity management model: Financial engineering, governance engineering, and operational engineering. Each of these activities is characterized as a potential solution to the aforementioned principal-agent problem in public corporations. First, under financial engineering, buyouts typically result in the elevated leverage ratios for portfolio companies for a sustained period of time. Jensen (1986, 1989) argues that pledging future cash flows to pay down the debt reduces the agency problems and leads managers to engage in less empire building. Moreover, the higher interest payments increase the present value of the interest tax shields, thus enhancing the value of the company, as long as the cost of financial distress does not increase significantly as a result. These are described as the financial engineering aspect of the private equity management model.

Second, under governance engineering, the private equity sponsors typically obtain majority ownership of the portfolio companies they acquire. This eliminates the free-rider problem of monitoring public companies and enables private equity sponsors to closely monitor their portfolio company executives using both hard and soft information about the executives' managerial performance. Combined with the lack of public stock prices and extended holding period, the monitoring focus shifts from short-term earnings management to long-term value realization. Additionally, portfolio company executives are typically given greater equity incentives under private equity ownership than when they are publicly held. Meanwhile, they receive less generous perks (e.g., less frequent use of private jets) than their public company counterparts. Since the equity shares are privately held and lack liquidity, executives are incentivized to realize long-term capital gains for the company, which they can unlock only after the investments are exited, rather than short-term upswings in the stock prices.

Finally, private equity firms accumulate in-house industry and operating expertise by hiring operating partners with operating backgrounds and an industry focus, and then apply this expertise to add value to their portfolio companies. Kaplan and Stromberg (2009) note that, while financial and governance engineering were common by the late 1980s, operating engineering was added in more recent years to private equity firms' repertoire of value-creating tools. Private equity firms use this industry-specific know-how to identify attractive targets, to develop value creation plans, and to implement the plans.

3.3 Posited Solutions with Private Equity Management Model 2.0: Growth, Competency, and non-Financial Outcomes

While the early literature analyzed the private equity management model through the lens of fixing what is broken in the public company governance mechanism, more recently the literature has expanded its focus to the rationale behind private-to-private private equity transactions. After all, most private equity transactions are private-to-private deals, so how can the private equity funds unlock value for companies that already have concentrated ownership and illiquidity? The literature offers two possibilities. First, many private companies face limited access to capital, and this constrains their ability to grow. By unlocking the access to both debt and equity capital, the private equity sponsors may spur growth in the private companies they acquire. Second, private companies may lack the scale, name recognition, and prestige of public companies to attract professionalized managers (e.g., MBA graduates), and thus be less effective at executing their corporate strategy. By becoming associated with prominent private equity firms, which routinely recruit professional executives for their portfolio companies and often have in-house operating partners with senior industry expertise, private companies may improve the managerial skill level of their personnel.

The recent push by institutional investors to incorporate ESG factors into their investment process creates yet another possibility that the private equity management model offers a differential outcome for investors with pro-social or pro-environmental preferences. For example, Hart and Zingales (2017) argue that when (i) shareholders have pro-social preferences, (ii) profit-making and damage-generating activities of companies are non-separable, and (iii) government cannot perfectly internalize negative externalities through laws and regulations, then companies should seek to maximize shareholder welfare rather than market value. Prosocial investors in the model are ethical in plausibly limited ways: If put to a vote, they put positive weight on externalities generated by their decisions, but without such votes they are "willing to hold shares in tobacco or gun or oil companies, and indeed will pay full price for these shares" (p. 267). This and the atomistic weight of individual shareholders creates an "amoral drift," a tendency for public

companies to "underweight social surplus much more than privately held companies" (p. 258). Focusing on public companies, the authors propose allowing broader shareholder proxy voting on corporate policy as a mechanism to implement the welfare-maximizing objective that aggregates the preferences of the shareholders. This proposal is interesting because with the private equity fund structure, limited partners and general partners can write a contract that aggregates the preferences of the limited partners at the inception of the fund. Moreover, the weight of individual investors in the partnership and in the ownership structure of each portfolio company is substantial, and thus prevents the amoral drift. Though Fama (2021) raises concerns about the difficulty of coordinating heterogenous and multi-dimensional ESG preferences of investors in public companies, the 10-year commitment requirement of private equity funds prevents limited partner turnover and temporal shift in aggregate investor preferences. Thus, the debate on ESG incorporation raises a possibility that private equity-owned companies make choices that are more consistent with social preferences of their ultimate owners than either public companies or non-private equity private companies.[2]

3.4 Ambiguity of the Effect of Private Equity Management Model on Stakeholders and Society at Large

While research suggests that the private equity management model has a positive effect on shareholder value, its effect on the company's other stakeholders or society at large is far from clear. For example, suppose a private equity fund takes over a portfolio company and provides its executives with high-powered incentives of significant long-term equity stakes. The company executives, in response, implement heavy investments in high-growth divisions, upgrade the company's IT system, and upskill its high-skilled labor through IT training, while automating and offshoring low-skill jobs and divesting non-performing divisions. On the one hand, this might result in rent extraction from the company's manufacturing plant employees, who face either job losses, or wage and benefit reductions, as posited in Shleifer and Summers (1988). On the other hand, the same strategy implementation may also result in enhanced rent sharing with the so-called knowledge workers of the company, who experience upskilling, productivity increases, and thus wage and benefit increases.

[2] Also see Broccardo, Hart and Zingales (2021), Pedersen, Fitzgibbons, and Pomorski (2021), and Pastor, Stambaugh, and Taylor (2021).

Likewise, the effects of high-powered incentives of private equity portfolio company executives on the company's customers, the government/taxpayers (via tax revenues or subsidy payments), industry-level innovation, or the environment are a priori ambiguous and remain open empirical questions. This is natural in the sense that the logic/rationale of the private equity management model is traditionally shareholder-centric, and the effects on other related parties are side products of the pursuit of a single-objective maximization. One exception is the newly emerging realm of impact investing, which is an explicitly dual-objective investment model where investors intentionally wish to pursue financial as well as non-financial goals simultaneously.

4. IMPACT ON MANAGEMENT, PRODUCTIVITY, AND EFFICIENCY

4.1 Executives, Management, Board of Directors

It is common for private equity investors to replace a portfolio company's management in connection with a private equity transaction. In a survey of (mostly U.S.-based) private equity investors, Gompers, Kaplan, and Mukharlyamov (2016) find that CEOs and CFOs are replaced in 30.6%–42.9% of private equity transactions and that 57.8% of the surveyed private equity firms routinely recruit their own senior management teams. Biesinger, Bircan, and Ljungqvist (2020) study value creation plans for the individual deals of (mostly emerging market) private equity funds; 20% of the plans explicitly mention replacing the CEO, 20% mention replacing the CFO, and 26% of the plans mention replacing other managers.

Replacing managers matters. Looking at buyout transactions, Guo, Hotchkiss, and Song (2011) find that operating cash flows improve more when the private equity firm replaces the CEO at or soon after the buyout. Focusing on the individual CEOs of the portfolio companies and their personalities and traits, Kaplan, Klebanov, and Sorensen (2012) report that a CEO's execution ability is particularly important for a successful outcome. Interestingly, Biesinger, Bircan, and Ljungqvist (2020) reach a similar conclusion from the value creation plans. They find that the action items that are actually implemented are more important than the specific choice of strategy, with diminishing returns to making plans ever more detailed, leading them to conclude that "execution is the key."

Given this focus on the management it is perhaps unsurprising that portfolio companies tend to have better management practices. In an extensive study of management practices, Bloom, Sadun, and Van Reenen (2015) conduct about 15,000 interviews with managers in about 10,000 manufacturing plants in 34 countries and score their management practices. They find that private equity-owned companies have better management practices than most other company types such

as family-run, founder owned, or government owned firms. The only exception is dispersed shareholder firms (e.g., publicly-listed firms), which have similar levels of the management score as private equity-owned firms. They find a significant gap in the quality of management practices between private equity-owned portfolio companies and the practices of family-owned and other private companies. This gap is robust not only in developed countries but also in developing countries – where private ownership of companies is more prevalent and where capital markets are less developed than in developed economies – suggesting that in those countries private equity acquisition is an important mechanism through which better management practices are introduced to private companies. This finding is noteworthy because most companies are private companies, especially in developing countries with less developed public markets, and these private companies are the typical targets of private equity acquisitions.

An important aspect of management practices is management compensation. Gompers, Kaplan, and Mukharlyamov (2016) report that private equity investors use more aggressive compensation packages to incentivize the senior management of portfolio companies. In 61.1%–65.1% of the transactions in their study, the private equity investors specifically mention improved managerial incentives as a source of increased value. Cronqvist and Fahlenbrach (2013) find that private equity investors increase the CEO's base salary and bonus by 25%, with the salary increases concentrated among newly appointed CEOs. About half of the equity grants to portfolio company CEOs only vest at the time of an exit event, such as a sale or IPO of the portfolio company, which aligns the CEOs' incentives with the investors' need for a timely exit. Severance contracts for portfolio company CEOs are also stricter with respect to unvested equity, which is often forfeited. Cronqvist and Fahlenbrach (2013) further report that private equity investors are less likely to tie CEO compensation and bonuses to qualitative, nonfinancial, and earnings-based performance measures. Instead, CEO compensation and bonuses depend on more quantitative targets, such as cash flow-based measures (e.g., EBITDA) with less accounting discretion. Bloom, Sadun, and Van Reenen (2015) find a slightly weaker relation in their global survey of management practices. They report that private equity-owned companies provide significantly stronger managerial incentives with more direct links to the managers' effort and ability. However, only the unconditional difference is statistically significant, and it becomes insignificant when they include country, company, industry, and other controls. Nevertheless, the broader evidence suggests that private equity ownership provides CEOs with steep financial incentives to align the managers' interests with the interests of the private equity investor.

Another important aspect of management practice is managerial turnover. Interestingly, while private equity investors are initially more likely to replace management at the time of the buyout

transaction, Cornelli and Karakaş (2015) document that once the deal is completed, private equity investors are less likely to replace management going forward. They attribute this lower turnover rate to private equity investors having more inside information and being more effective at monitoring the managers, which in turn allows the private equity investors to evaluate the managers' performance over a longer time horizon relative to their publicly-traded counterparts. Consistent with this interpretation, Bloom, Sadun, and Van Reenen (2015) find that portfolio companies have particularly strong monitoring practices (described as "practices around continuous performance measurement, improvement, and feedback") as compared to other types of companies.

Cornelli, Kominek, and Ljungqvist (2013) use monitoring reports from the European Bank for Reconstruction and Development (ERBD) to study determinants of individual turnover decisions. The reports allow them to distinguish between the role of "soft" and "hard" information when the boards of portfolio companies replace the CEO. Interestingly, soft information seems to play a larger role than hard information. One interpretation is that private equity investors have closer and more direct connections to the managers and boards of their portfolio companies, and that these investors are therefore less likely to replace a CEO for bad performance that is due to external factors, e.g., bad luck. Instead, they argue, private equity investors are more deliberate when replacing CEOs, which is in contrast to the boards of publicly-traded companies, which appear to place less weight on the reasons for poor performance. To identify the causal effect, the authors exploit staggered governance reforms that increase boards' personnel authority to dismiss CEOs and find that forced CEO turnover causes improved firm performance.

Acharya, Kehoe, and Reyner (2009) explore the board dynamics of UK-based portfolio companies in more detail. They confirm that CEOs are replaced in connection with private equity transactions, as mentioned above, and they also interview twenty chairpersons and CEOs that have experience with both public and private boards. Contrasting the board structures of private equity-owned portfolio companies with the structures in UK public companies (PLCs) in the FTSE 100, they report that private equity boards are more efficient and have a more concentrated focus on value creation. PLC boards suffer from being larger, being more focused on quarterly profits and market expectations, and having greater concerns about the reactions of external stakeholders than the impact of their decisions on business performance. They identify three main characteristics of private equity boards: they are well-aligned with a focus on value creation, clearly articulate and insist on strategic and performance priorities, and have a greater engagement by the board members. In their sample, three-quarter of the interviewees report that private equity boards add more value than PLC boards. None reported that the public counterparts were better.

4.2 Productivity and Efficiency

In his classical analysis of the agency problems facing different types of companies, especially conglomerates, and the value of the private equity governance model, Jensen (1989) focuses on the "free cash flow problem" in poorly governed companies. This agency problem arises when mature companies with stable cash flows and few profitable investment opportunities make wasteful investments to promote managerial empire building (see also Jensen 1986). According to Jensen (1989), the ability to mitigate this problem is a main benefit of private equity ownership. In support of the free cash flow hypothesis, Opler and Titman (1993) find that high cash flow firms with low Tobin's *q* are more likely to be acquired in a buyout. A more direct test of this hypothesis is the study by Edgerton (2012) of corporate fleets of private jets. Larger jet fleets typically reflect wasteful managerial perks, and consistent with Jensen's hypothesis Edgerton (2012) finds that private equity-owned portfolio companies have significantly smaller fleets than other publicly-traded or private companies, on average, and he finds clear reductions in fleet size after public companies are taken private in buyouts. Many public companies have fleets that appear large by the standards of private equity-owned companies, which he argues is consistent with agency problems in these public companies, although with the caveat that excessive fleets are far from ubiquitous in public companies.

Early Studies Although Jensen (1989) originally focused specifically on the "free cash flow problem" a number of other studies published around the same time found more general improvements in the productivity of portfolio companies, and they generally reported that the increases in productivity were not primarily due to reductions in employment.

In their study of a single prominent transaction, Baker and Wruck (1989) explore the highly levered 1986 acquisition of the O.M. Scott & Sons Company as a divisional buyout from the ITT conglomerate. Baker and Wruck report that "operating performance improved dramatically following the buyout" with sales increasing by 25% and earnings before interest and taxes increasing by 56%. The improvements are attributed to three factors: the constraints imposed by high leverage, changes in managerial compensation, and improvements in monitoring and advising of Scott's top management. Moreover, they find no evidence that the improvements came at the expense of employees, although annual employment declined by 9% through natural attrition over the first two years following the buyout. Additionally, the improvements were not caused by a reduction in spending on R&D, marketing, or capital expenditures, which actually increased by 23% after this buyout.

Other early studies, using larger samples of private equity transactions, largely confirm these findings. Kaplan (1989a) find substantial increases in operating income, net cash flows, and market value in a sample of 76 portfolio companies, and he argues that these increases are due to improved managerial incentives and reduced agency problems, not transfers from employees. Smith (1990) reports similar increases in operating cash flows in a sample of 58 portfolio companies, and she highlights the role of improved working capital management and managerial incentives. She also confirms that the increase in operating returns is not due to layoffs or reductions in advertising, maintenance, or research and development, although she does find a decline in capital expenditures.

Muscarella and Vetsuypens (1990) consider 72 reverse LBOs, i.e., transactions where a portfolio company that was previously public and is then taken private in a private equity transaction is later listed again in an IPO. As part of the IPO process, the company must disclose several years of financial statements, and these reverse LBOs therefore offer a view into the financials and operations of portfolio companies before and after the private equity transaction, although the subsample of portfolio companies that undergo this specific sequence of transactions may not be representative. Consistent with the previous studies, Muscarella and Vetsuypens (1990) find that portfolio companies in their sample show significant improvements in profitability, mainly due to cost reductions. They do not find evidence of reductions in employment.

Finally, Lichtenberg and Siegel (1990) use Census data for 72 portfolio companies to study changes in total factor productivity (TFP). In the three years following a buyout the average TFP increases by 8.3% relative to the industry average. Consistent with the above studies, they do not find any change in the employment of production workers ("blue-collar"), and they report cumulative increases in the compensation of these production workers of 2.3% to 3.6%. The employment of non-production workers ("white-collar"), however, declines by 8.5%.

Later Studies Later studies of private equity transactions that took place during the 1990s and 2000s find more mixed results and generally do not find statistically significant effects on productivity and profitability. In an unpublished working paper, Leslie and Oyer (2008) contrast portfolio companies with publicly-traded comparable companies. Like Muscarella and Vetsuypens (1990), Leslie and Oyer study reverse LBOs—i.e., portfolio companies that were publicly traded before being acquired by a private equity fund and which became publicly traded again when the fund listed them in an IPO. Their sample contains 144 such transactions taking place from 1996 to 2005. They report that top managers of portfolio companies have substantially higher-powered compensation contracts. These managers own more equity, have lower base salaries, and have a larger fraction of variable compensation. In terms of operational improvements, they find that

portfolio companies improve the measure Sales per Employee. However, they find no statistically significant changes in their other performance measures: Return on Assets (ROA), EBITDA / Total Assets, and Employees / Total Assets.

When interpreting accounting measures of operating performance, a concern is whether portfolio companies engage in more aggressive earnings management. Katz (2009) finds that private equity-backed companies have higher earnings quality than those that do not have private equity sponsorship, engage less in earnings management, and report more conservatively both before and after the IPO. These findings are consistent with tighter monitoring and reputational considerations exhibited by buyout investors.

Following Leslie and Oyer (2008), Guo, Hotchkiss, and Song (2011) also revisit the productivity impact of private equity in a sample of 194 public-to-private U.S. buyout transactions from 1990 to 2006, with deal values exceeding $100 million. They find an 11% increase in EBITDA and net cash flows. They also find some improvements in operating performance, although these are not statistically significant.

Cohn, Mills, and Towery (2014) study 317 buyouts of previously public companies, taking place from 1995 to 2007, using earnings and revenue information from corporate tax filings. Consistent with the above studies, in this sample of public-to-private transactions, they find no significant effects on Return on Sales, Return on Assets, and their measure of economic value added (EVA).

Following up on the previous study, however, Cohn, Hotchkiss, and Towery (2022) use the tax filings to study 288 buyouts, taking place from 1995 to 2009, but now focusing on buyouts of private companies. Interestingly, the findings are different in this sample of private-to-private transactions. They find a moderate but significant increase in profitability, both in absolute terms and relative to the industry. Moreover, they find large and rapid increases in revenue after a buyout, which they argue reflects both organic and acquisition-driven growth. Their interpretation is that for the private targets considered in this sample, unlike for public targets, a main source of value creation is unlocking growth opportunities by relaxing financing constraints. The relatively active market for acquisitions of U.S. private companies enables private equity acquirers to use portfolio companies as platforms for acquiring other small companies. While buyouts of public companies may alleviate overinvestment problems, their results suggest that buyouts of private companies solve underinvestment problems. They find no evidence that financial engineering is a significant source of value creation for buyouts of private companies, since these companies already have

relatively high levels of leverage and therefore only see a smaller increase in leverage following the transaction.

Davis, Haltiwanger, Handley, Jarmin, Lerner, and Miranda (2014) use Census data to investigate, among others, the effects of U.S. buyouts on the total factor productivity (TFP) of manufacturing plants. For this analysis, they have TFP data for 286 multi-unit manufacturing companies acquired by private equity firms between 1980 and 2003. The risk of a plant exiting in the two years after the acquisition depends critically on the productivity of the plant. In the bottom tercile of the TFP distribution, the exit probability is significantly higher for plants operated by private equity-owned portfolio companies than for plants operated by companies in the control group. In contrast, there are no significant differences in the exit probabilities in the middle and top terciles. They report a similar pattern for the opening of new plants. Plants opened by private equity-owned companies are substantially more likely to be in the top tercile and significantly less likely to be in the bottom tercile than plants opened by companies in the control group. For continuing plants, they do not find evidence of changes in productivity relative to plants in the control group. Overall, they summarize their findings as evidence that private equity firms reallocate activity to raise TFP, that the large TFP advantage of portfolio companies reflects a concentration of new plants in the upper part of the TFP distribution and exits of plants in the lower end of the TFP distribution, and that their results refute the view that the returns to private equity rest entirely on private gains to financial engineering and wealth transfers from other stakeholders.

In a recent working paper, Davis, Haltiwanger, Handley, Lipsius, Lerner, and Miranda (2021) revisit the analysis using an extended sample and refined empirical methods. Their results, while preliminary, show even larger average productivity gains when both manufacturing and non-manufacturing industries are included the sample (in contrast, the previous study only included manufacturing industries). Moreover, this analysis also suggests that there are significant differences between public-to-private and private-to-private buyouts, consistent with the different findings in Cohn, Mills, and Towery (2014), focusing on public-to-private transactions, and Cohn, Hotchkiss, and Towery (2022), focusing on private-to-private transactions.

Studies of Non-U.S. Transactions The studies mentioned above have primarily studied U.S.-based portfolio companies. It is interesting to supplement these studies with studies of buyouts in other countries. Other countries have different regulatory and governance systems. They typically have relatively more privately held companies, and they may have capital markets that make it more difficult for these companies to raise external capital, leaving them more capital constrained. Other countries also often have better data for portfolio companies than what is available for U.S.

private companies. Interestingly, studies of non-U.S. buyouts find more consistent evidence of operational improvements than the studies of U.S. buyouts during the same periods. This difference may be due to differences in the nature of buyouts in these counties or to the composition of buyouts in these other countries having relatively more private than public targets.

In an early study of non-U.S. buyouts, Bergstrom, Grubb, and Jonsson (2007) consider the entire universe of 73 Swedish buyout exits, exceeding $5m, during the period 1998 to 2006. They find substantial and significant improvements in EBITDA margins and ROIC, and smaller increases in revenue which are less statistically significant. Moreover, employment and wage levels in their portfolio companies have not declined relative to the levels in comparable Swedish companies. A natural concern about this study is selection bias, since the sample is a sample of realized exits. Portfolio companies that have gone bankrupt or are being held for extended time periods may be underrepresented in this sample, although Bergstrom, Grubb, and Jonsson argue that this is rare in Sweden and therefore unlikely to affect their results.

Boucly, Sraer, and Thesmar (2011) find even stronger effects in a sample of 839 French buyouts during 1994 to 2004. They use financial statements from tax filings to track the portfolio companies before and after the buyout, and they find large and statistically significant growth in profitability, employment, sales, and capital expenditures. From four years before to four years after the transaction, employment grows by 18%, assets grow by 12%, and sales grow by 12%, on average, relative to comparable companies. Interestingly, this growth is concentrated in portfolio companies that are privately-held before the buyout, i.e., private-to-private transactions, as opposed to divisional buyouts or buyouts of publicly-traded companies. In France, these privately-held companies are often owned by an individual or a family that is cashing out of its business. Moreover, the improvements are concentrated in portfolio companies in industries that rely more on external capital. Overall, the evidence suggests that private equity investments relax credit constraints for portfolio companies and that this benefit may be particularly important in France due to its relatively underdeveloped capital markets, at least during this sample period. The findings and interpretation appear consistent with Cohn, Hotchkiss, and Towery (2022) and Davis, Haltiwanger, Handley, Lipsius, Lerner, and Miranda (2021), discussed above, who study recent buyouts of U.S.-based private companies, and who also find strong growth and evidence of private equity investments alleviating capital constraints for these portfolio companies.

Focusing on innovation and patenting, Amess, Stiebale, and Wright (2016) study 407 U.K. buyouts between 1998 and 2005. They find a 6% increase in quality-adjusted patent stock three years after the buyout, but improvement in innovation is even stronger for private-to-private transactions and for portfolio companies in financially dependent industries, which is also

consistent with private equity investments relaxing financial constraints in portfolio companies and facilitating their investments in innovation activity. Nikoskelainen and Wright (2007) and Renneboog, Simons, and Wright (2007) provide further UK evidence, and Cumming, Siegel, and Wright (2007) provide a literature review of global evidence related to governance and financial and real returns to private equity.

Studying European acquisitions more generally, and excluding private equity transactions, Erel, Jang, and Weisbach (2015) find significant increases in investments, reduced cash holdings, and lower investment cash flow sensitivities after these acquisitions, which they interpret as evidence that financial constraints are reduced for target companies in general acquisitions, and not just for private equity-driven ones.

Role of General Partners Acharya, Gottschalg, Hahn, and Kehoe (2013) study the role of general partners in a sample of 395 buyout acquisitions of European portfolio companies from 1991 to 2007. They find that the EBITDA to Sales ratio increases by 0.4% annually, on average relative to the sector mean, and that the deal multiple, EBITDA to Enterprise Value, increases by around 1, on average relative to the sector mean. They interpret these improvements as the causal impact of private equity ownership, which creates economic value through operational improvements. Interestingly, they go further and explore the identities and backgrounds on the individual general partners that are responsible for managing the transactions for the private equity firms. Deal partners with an operational background, typically ex-consultants or ex-industry managers, are associated with greater outperformance in "organic" deals the portfolio company improves internally. In contrast, partners with a background in finance, i.e., ex-bankers or ex-accountants, are associated with "inorganic" and M&A driven strategies.

Echoing the heterogeneity of value-creation strategies employed by private equity firms, Davis, Haltiwanger, Handley, Lipsius, Lerner, and Miranda (2021) find that employment effects of private equity ownership is highly persistent over time at the general partner level. Spaenjers and Steiner (2021) study specialist vs. generalist private equity investors in the U.S. hotel industry and find that specialist private equity investors are associated with value creation through operational performance improvement. In contrast, generalist private equity investors are associated with value creation through cheaper source of debt financing. Biesinger, Bircan, and Ljungqvist (2020) find systematic differences across funds in their ability to achieve the objectives set out in the value creation plans for their deals. Funds with focused, homogeneous portfolios of predominantly minority positions are better at implementing these plans than other funds. Bernstein and Sheen (2016) find that private equity firms with specific experience in the restaurant industry do significantly better than firm with more general operational experience.

4.3 Financial Distress and Bankruptcy

A natural concern is whether the high leverage imposed on portfolio companies in connection with a private equity deal makes the company more financially fragile. In a study of U.S. private equity deals, Hotchkiss, Smith, and Strömberg (2021) find that private equity-backed companies have higher leverage and because of this leverage these companies default at higher rates than other companies borrowing in leveraged loan markets. However, conditional on being in default, private equity-backed companies restructure more quickly and more frequently out of court, and private equity owners are less likely to be wiped out in this process.

Wilson and Wright (2013) consider a sample of UK companies, focusing on UK private equity deals during 1995 to 2010. Controlling for size, age, sector and other conditions, they claim that portfolio companies in private equity-backed buyouts are no more likely to become insolvent than other similar companies.

Neither study considers the externality cost of distress and bankruptcy on other stakeholders or the broader economy. Thus, while private equity investors may avoid some of the negative impact of distress and bankruptcy despite the high leverage of portfolio companies, the impact on other stakeholders and the broader economy remains under-studied.

5. IMPACT ON EMPLOYEES AND OTHER STAKEHOLDERS

A common concern about private equity is that it does not actually create value but instead expropriates value from a broader set of the portfolio company's stakeholders. As mentioned earlier, in their seminal work, Shleifer and Summers (1988) study this question in the context of hostile takeovers and conclude that "transfers from stakeholders to shareholders could make for a large part of the takeover premium" (p. 53), including transfers from workers, suppliers, and the government (in the form of tax savings from high leverage). They note, however, that private equity encompasses both hostile takeovers and friendly M&As, and they are "targeted at very different companies" and represent difference "economic processes." This observation echoes the heterogenous outcomes on growth and productivity documented in Section 4 for public-to-private versus private-to-private transactions.

5.1 Employment and Wages at Portfolio Companies

The two most comprehensive studies of the effects of U.S. buyouts on employment and wages are Davis, Haltiwanger, Handley, Jarmin, Lerner, and Miranda (2014) and their follow-on study Davis, Haltiwanger, Handley, Lipsius, Lerner, and Miranda (2021).[3]

Davis, Haltiwanger, Handley, Jarmin, Lerner, and Miranda (2014) use U.S. census data to track employment at 3,200 portfolio companies and their 150,000 establishments that were acquired by private equity funds from 1980 to 2005. They match portfolio companies and establishments to similar controls and follow the targets and matched controls over several years after the private equity transaction. They find that portfolio companies reduce employment by less than 1% relative to control firms in the first two years, but this small net effect masks large differences in the outcomes at the establishment level. Specifically, private equity owners actively re-allocate employment across existing establishments by reducing employment or exiting establishments altogether at some locations, while expanding employment at other locations. Further, portfolio companies create more greenfield jobs at new establishments than control firms. Portfolio companies also acquire and divest more than controls. Finally, earnings per worker in portfolio companies declines by 2.4% relative to controls.

Expanding on this original study, Davis, Haltiwanger, Handley, Lipsius, Lerner, and Miranda (2021) examine U.S. private equity buyouts from 1980 to 2013, increasing the sample to about 3,600 targets and 6.4 million total company-level observations. The main insight of this follow-on study as it relates to employment impact of private equity buyouts is the sharp contrast in outcomes between public-to-private versus private-to-private deals: Employment shrinks 13% over two years after buyouts of publicly-listed firms relative to control firms, but expands 13% after buyouts of privately-held firms. The authors argue that "[f]or targets that trade publicly before the buyout, private equity groups may focus on tackling the agency problems … whether manifested as excess headcounts, wasteful perquisites, or value-destroying "pet projects." They also point out that the results are consistent with the workforce re-contracting hypothesis (through the breach of implicit long-term contracts) of Shleifer and Summers (1988). In contrast, at targets that were privately

[3] Kaplan (1989a) finds that raw median employment growth (excluding divestitures) of large public-to-private buyouts is 4.9% and negative but insignificant when industry-adjusted. Faccio and Hsu (2017) find evidence of higher job creation by targets of politically connected private equity firms than non-connected private equity firms. Consistent with an exchange of favors story, politically connected private equity firms increase employment more during election years and in states with high levels of corruption.

held before buyouts, the main constraints that private equity ownership addresses are the access to capital markets and managerial competence, not agency costs.

Antoni, Maug, and Obernberger (2019) study 511 German private equity buyouts and match establishment-level data with individual data. They find that buyout establishments reduce employment by 8.96% relative to controls, which consists of an increase in the separation rate by 18.75% and an increase in the hiring rate of 9.79%. The active job creation and destruction results resemble those of Davis et al. (2014, 2021). While the large average job losses at the establishment level appears to be at odds with Davis et al. (2014, 2021), note that Antoni et al. (2019) do not include new establishments that are opened after the buyouts, which Davis et al. (2014, 2021) include. Employment at existing establishments in Davis et al. (2014), for example, declined by 3% relative to controls for U.S. buyouts.

Evidence on the effect of private equity ownership on wages is mixed. Part of the empirical challenge is that it is difficult to isolate wage changes for a given job from compositional changes in the overall mix of jobs in the total employment pool. Researchers typically observe the total compensation and the headcount, rather than wages for specific workers. Thus, the average compensation per worker could change after buyouts due to compositional changes, even if the wage for each position remains unchanged. In the U.S., Davis, Haltiwanger, Handley, Lipsius, Lerner, and Miranda (2021) find that compensation per worker rises in divisional targets while it falls for private-to-private deals, while the changes are not statistically significant for public-to-private and secondary deals. The authors suggest that increases at divisional buyouts may reflect "job title upgrading"—i.e., pay increase that comes with new titles (e.g., CEO as opposed to divisional manager) and increased responsibilities, mostly concentrated at top managerial positions. In another earlier U.S. study, Lichtenberg and Siegel (1990) find that wages for white-collar workers decline after buyouts, whereas those for blue-collar workers remain unchanged.

In a study of 1,350 UK buyouts, Amess and Wright (2007) find that LBOs have significantly lower wage growth than non-LBOs. Similarly, Antoni, Maug, and Obernberger (2019) find that the average German buyout target employee loses €980 in annual earnings relatives to employees at control group firms, or 2.8% of median earnings. Note that Antoni et al. (2019) overcome the data issues described above by using individual worker-level data.

Fang, Goldman, and Roulet (2021) study private equity buyouts matched to French administrative data on employee pays and find that the pay gaps between young and old, men and women, and mangers and non-managers decrease after the buyout. Compositional effect drives these results: the companies replace expensive employees with cheaper ones and the remaining employees

receive small pay increases. The results suggest that wage inequality declines as a side effect of private equity pursuing profit maximization. The compositional change is consistent with the overall active re-allocation and shuffling of jobs by private equity reported in Davis et al. (2021).

5.2 Impact on Workers' Welfare

Most existing studies on employment and private equity are focused on jobs (positions) rather than workers (individuals). Several papers shed light on the impact of private equity ownership on career outcomes of workers who were employed at portfolio companies at the time of buyouts, and determinants of variation in their outcomes. Focusing on individual workers as the unit of analysis and tracing them over time after departures from portfolio companies is useful for understanding the distributional impact of private equity ownership on stakeholders and the broader society. It also helps evaluate evidence of wealth transfers as opposed to value creation, as suggested by Shleifer and Summers (1988): "[t]o see whether the parties that lose association with the acquired firm suffer wealth losses, one must trace their subsequent employment."

Reporting from Sweden, using employer-employee linked register data, Olsson and Tåg (2017) study the differential incidence of unemployment among workers performing different job tasks and at different positions within the wage distribution at portfolio companies. They find that workers performing automatable routine tasks at targets that lagged behind peers in productivity pre-deal were 10.2 percentage points more likely to experience unemployment spells, and workers performing offshorable job tasks were similarly 8.6 percentage points more likely to experience unemployment spells. This is despite the fact that there is little evidence of average changes in unemployment after the buyouts; in other words, the unemployment increases are unevenly distributed and is concentrated in workers whose job tasks were replaceable by either internal IT investment in automation or by offshoring. Routine task workers experience 12.7% decrease in labor income after separation from the portfolio company, suggesting that they receive lower wages at a new job. Both findings of unemployment and lower labor income are consistent with wealth transfers from separated workers to acquired companies. At the same time, productivity gain at low-productivity companies from automation and offshoring is consistent with value creation. Finally, layoffs are concentrated among workers in the middle of the wage distribution at portfolio companies, thus supporting the notion that private equity ownership accelerates job polarization within portfolio companies.

The polarization result appears somewhat at odds with the French results in Fang, Goldmanm, and Roulet (2021), who report that expensive (older, male) workers were more likely to separate and are replaced by cheaper (e.g., younger) workers, resulting in lower wage inequality

within firms. However, Olsson and Tåg (2017) note that the elevated unemployment results in their study are concentrated in low-productivity Swedish firms, which may be more similar to the U.S. public-to-private targets studied in Davis et al. (2014), whereas high-productivity Swedish firms may resemble growth-oriented French portfolio companies studied in Boucly, Sraer, and Thesmar (2011). Thus, it is possible that public-to-private and private-to-private deals also have opposite wage distributional effects.

Antoni, Maug, and Obernberger (2019) study German buyouts and find that managers and older workers are not more likely to be fired than other types of workers, but conditional on leaving the portfolio companies they appear to have a more difficult time finding new jobs with equivalent pay. In contrast, low-wage workers are more likely to be fired but will quickly start at another low-wage job. Consequently, managers and older workers are worse off than other workers as a result of buyouts. On the other hand, the authors also find that jobs that require stronger IT skills increase in two years after buyouts, consistent with private equity implementing investments in IT upgrading that increases productivity of skilled workers while replacing less-skilled workers with automation.

Focusing more on the spillover effects of IT upgrading investments on the welfare of skilled workers at portfolio companies, Agrawal and Tambe (2016) study long-term career paths of employees at portfolio companies relative to matched non-private equity employees. First, they find that portfolio companies hire more IT workers relative to controls in years after 2000, suggesting that private equity firms regard IT upgrading as part of their operational improvement strategies, especially after the Internet/e-commerce boom of the late 1990s. Second, they find that employees at portfolio companies experience 6-9 percentage points longer employment spells relative to control groups, both while working at the target firms and after separating from them and moving to other employers. The effect is driven by workers whose jobs are transformed by IT diffusion (including production), consistent with the interpretation that these workers are now expected to acquire IT-complementary skills on the jobs, which then become transferrable skills that help the workers advance their careers both within and outside of the original employers. Further, workers who perform IT-complementary tasks experience shorter unemployment spells after leaving the portfolio company and earn higher long-run wages.

Beyond long-run employability and wage growth at the worker level, Cohn, Nestoriak, and Wardlaw (2021) present evidence of a large, persistent decline in establishment-level workplace injury rates after buyouts of publicly-traded U.S. companies. Annual injuries per employee fall by 0.74 to 1.00 percentage points relative to control groups, or 11.1% to 15.0% of the pre-buyout mean. The injury rates decline more sharply at firms that were under more short-term performance

pressure before buyouts (e.g., more analyst coverage, transitory institutional ownership, and discretionary accruals). The authors argue that the results dovetail with the view that "the private nature of private equity ownership promotes long-term investment by removing a firm from the scrutiny of public markets."

The studies reviewed in this section illustrate the bifurcated outcomes for worker welfare depending on (1) pre-private equity ownership status (public or private) and (2) whether IT complements or substitutes your job. For either workers at private-to-private targets or workers who perform IT-complementary tasks in their jobs, private equity ownership is associated with increased employment and improved long-run wage growth in general. In contrast, for either workers at public-to-private targets or workers who perform automatable or offshorable tasks, private equity ownership is associated heightened risk and longer spells of unemployment, and slower long-run wage growth.

5.3 Other Stakeholders

Brown, Fee, and Thomas (2009) find that suppliers to LBO companies experience significantly negative abnormal returns at the announcements of downstream LBOs. They also find that suppliers who have likely made substantial relationship-specific investments are more negatively affected, both in terms of abnormal stock returns and reduced profit margins, than suppliers of commodity products or transitory suppliers. Interestingly, the results are not present for recapitalizations, suggesting that "increases in leverage *combined* with changes in organizational form result in supplier price concessions." The results are consistent with wealth transfers from suppliers to portfolio companies under the new management who uses the elevated leverage as a commitment device to drive harder bargains with suppliers.

6. IMPACT ON BROADER SOCIETY

In this section, we review the literature that examines the impact of private equity on broader society. As discussed in Section 3, the effect of high-powered incentives of private equity portfolio company executives on the broader society is ambiguous and remains an open empirical question. As shown below, one emerging insight from the extant literature is that the welfare outcomes for the broader environment and society depend on the regulatory and competitive structures within which the private equity portfolio companies operate. In competitive industries and industries that rely little on governments as payers, private equity ownership tends to result in enhanced consumer welfare, whereas in more concentrated industries and industries heavily dependent on governments as payers, private equity ownership tends to lead to pursuit of profit maximizations at the expense

of consumers. Similarly, the impact of private equity ownership on the environment is sensitive to the regulatory regimes under which the private equity portfolio companies operate, and the incentives the regulations give to the company executives.

6.1 Impact on Consumers through Portfolio Company Products and Services

As private equity funds transform their portfolio companies' operations, what impact will they have on consumers who either purchase products and services from the portfolio companies themselves or their competitors? For private equity ownership to have any impact on consumers, the private equity management model needs to include some operational engineering elements, and not just financial engineering elements. Moreover, even when operational engineering is at work, its impact on consumers can be positive or negative. Indeed, the literature finds divergent results depending on the competitive structure of the sectors that companies operate in. In lightly regulated, competitive industries with price-elastic demand, private equity ownership of private targets tends to be associated with enhanced consumer welfare via improved service, flat prices, and greater product variety. In contrast, in more heavily regulated, or government-subsidized industries, especially when operating in low-competition markets, private equity ownership can lead to diminished consumer welfare via higher prices, lower service quality, or both.

6.1.1 Competitive Industries

Bernstein and Sheen (2016) study the impact of private equity ownership on the operations of fast-food chains by studying comprehensive health inspection records at franchise locations in Florida. The authors find that restaurants become cleaner, safer, and better maintained after private equity buyouts, suggesting that private equity owners use their industry expertise to improve the business operations of their portfolio companies in the chain restaurant industry. Importantly, causal inference is made possible by comparing franchise-owned and private equity-owned restaurants. Improved health inspection performance is associated with greater customer satisfaction and restaurant profitability, so these operational changes enable private equity to achieve financial gains while also generating benefits for restaurant customers.

Fracassi, Previtero, and Sheen (2021) use micro-level retail scanner data to compare product varieties and prices of consumer products sold by private equity-owned and non-private equity-owned companies in retail stores. The authors find that private equity-acquired companies increase sales by 50% compared to matched control companies, not by increasing prices but by launching new products and expanding geographically to new store locations. Their sale growth squeezes their competitors' products out of shelf space. Interestingly, these results are driven entirely by

private-to-private deals. The findings are consistent with growth-oriented buyouts of capital-constrained, privately-owned companies. In contrast, public targets raise prices and reduce sales for existing products, echoing earlier results in Chevalier (1995a, 1995b) that find that private equity-acquired supermarket chains (most of which were public targets) tend to increase prices in local markets with other, highly leveraged rivals. Ewens, Gupta and Howell (2022) study private equity investments in local newspapers and find that production of local news content declines after private equity acquisitions, which is consistent with cost reduction.

In summary, private equity acquisition tends to have benign impact on consumers when targets are private and/or operate in competitive markets with low barriers to entry. When the targets are public or operate in less competitive local markets, private equity acquisition can result in higher prices and reduced sales or product availability to consumers.

6.1.2 Regulated or Subsidized Industries

The private equity management model manifests itself differently when it acquires targets in regulated or subsidized industries. In this section we review evidence from the healthcare and education sectors.

Healthcare Sector Evidence The healthcare sector is highly regulated, where revenues of healthcare providers are highly dependent on the reimbursement rates accepted by either the government payers (e.g., Medicare) or private insurers. Since consumers (recipients of healthcare services) typically do not fully pay out of pocket, incentives for providers to compete on price are considerably weaker. The opaqueness of the reimbursement process also makes it difficult for consumers to shop on prices ex ante. Finally, it is difficult to assess ex ante the product or service quality, though pro-competitive policies can mitigate this. These features appear to significantly shape the way in which private equity ownership impacts the healthcare service quality and price that consumers receive.

Gupta, Howell, Yannelis, and Gupta (2020) study the impact of private equity ownership on the quality of care for short-stay Medicare patients at for-profit nursing homes. They find that nursing staffing declines, while bed utilization increases, resulting in improved operational efficiency. However, the efficiency comes at the expense of declining quality, i.e., higher short-term mortality and lower incidence of Five Star ratings at private equity-owned facilities. The authors emphasize that because nursing homes largely rely on Medicare and Medicaid programs (that pay fixed rates per patient per day) for revenue, main levers for increasing profitability are staffing cost reduction, admitting more lucrative Medicare patients, and making them stay longer.

In a complementary study, Huang and Bowblis (2019) study the impact of private equity ownership on patient outcomes for long-stay Medicaid residents by comparing private equity-owned and non-private equity-owned for-profit nursing homes. In contrast to Gupta et al. (2020) that find declining health outcomes for short-stay post-acute elderly patients for private equity-acquired facilities, Huang and Bowblis (2019) find no significant difference between private equity -owned and non-private equity-owned for-profit nursing homes for long-stay Medicaid (non-elderly disabled) patients.

It is interesting that even in the highly regulated nursing home industry, the impact of private equity ownership on consumers is not uniform. What can explain the divergent findings? Gandhi, Song, and Updrashta (2021) suggest (i) heterogenous local market competitiveness and (ii) private equity managers' heightened responsiveness to competitive incentives may be key. They find that private equity acquirers compete on quality in locally competitive markets by increasing high-skilled registered nurse staffing more aggressively, while doing so only modestly in less competitive markets. They also document that, after the introduction of the Five Star System that improves transparency of staffing quality to consumers, private equity-owned facilities in competitive local markets increased staffing expenditure significantly whereas in low-competition markets they decreased staffing expenditure. Thus, even within the same industry, the impact of private equity ownership can differ depending on the competitive incentives the companies receive in the marketplace.

Beyond quality, other researchers have looked at private equity ownership's effect on consumer healthcare spending. Liu (2021) uses insurance claims data of privately insured individuals to study the impact of private equity entry to local hospital markets on healthcare spending by consumers. Counterfactual analyses of structural model estimations suggest that if private equity ownership of hospitals were banned, healthcare spending in local markets where private equity is present would drop by 11%. Higher healthcare spending in private equity-affected markets is driven mostly by higher negotiated prices with insurers, rather than with higher hospital service utilization. Rival hospitals in local markets also raise prices but only if they share a common insurer with private equity-backed hospitals. In addition to superior negotiation expertise of private equity owners, the bargaining model estimation implies that credible bankruptcy threat of highly-leveraged private equity-backed hospitals weakens the bargaining position of insurers, leading to higher prices. Furthermore, consistent with non-pecuniary benefit enjoyed by non-profit hospitals, price increases are larger when non-profit hospitals are acquired by private equity. In sharp contrast to the nursing home industry where the government payout rate is fixed, operational efficiency is barely changed under private equity ownership; instead, the prices charged to insurers

for the same quality service is sharply increased. To the extent that insurers pass on their increased spending to consumers via increased premiums, the study implies that private equity ownership of hospitals is detrimental to patient-consumer surplus via increased prices, while quantity and quality of services rendered are insignificantly changed.

Education Sector Evidence Higher education is another sector where, similar to the healthcare sector, government subsidies (federal student aid for low-income students) are crucial sources of revenues and many customers (students) pay subsidized tuition, thus weakening the providers' incentives to compete on price. The net tuition that students will pay (after grants and loans) is opaque, making it difficult for students to shop on price. There is a reputational incentive not to compete on price by providers, as high price is used as a signal for high quality. Finally, it is difficult to measure the quality of education both ex ante and ex post.

Eaton, Howell, and Yannelis (2020) study the impact of private equity acquisition on for-profit colleges' actions. The authors find that private equity acquisition leads to higher tuition and per-student debt, while education inputs, graduation rates, and earnings among graduates decline. Government aid is exploited more aggressively, and while loan repayment rates are lower, schools are not hurt because of government loan guarantees. The findings suggest that profit maximization through exploitation of government subsidies and loan guarantees may result in worse outcomes for customers (students) both through poorer education quality and higher prices.

For-profit schools, private equity-owned or not, appear to exploit federal aid programs and charge higher tuitions while capturing federal subsidies (Cellini and Goldin 2014). Eaton, Howell, and Yannelis (2020) argue that high-powered incentives of private equity ownership induce private equity-owned schools to more aggressively pursue profit maximization at the expense of students and the federal government.

6.2 Impact on Governments and Taxpayers

The private equity management model can affect government revenues and expenditures through several channels. First, financial engineering reduces tax liabilities of portfolio companies via increased interest tax shields (Kaplan 1989b). While this reduces tax collection from the private equity portfolio companies, governments may collect more taxes from banks who collect the increased interest payments from the portfolio companies, so the net effect is likely moderated. Second, private equity-backed companies may engage in other tax- and cost-avoidance activities as part of a shareholder value-creation strategy, including regulatory arbitrage. Note that with non-

leverage-related tax reductions, government tax revenues are effectively reduced (not recovered from banks).

Third, private equity-backed companies may engage in aggressive subsidy capture or risk-taking behavior that potentially costs taxpayers in events of distress or defaults by either the companies themselves or their stakeholders.

Interest Tax Shields Cohn, Mills, and Towery (2014) study U.S. federal corporate tax return data and find that private equity-acquired companies' leverage remain elevated even several years after the buyout, suggesting that private equity takeovers represent a one-time permanent change in the capital structure of the companies. Elevated leverage creates value via increased present values of interest tax shields and implies reduced corporate tax revenues from private equity portfolio companies. This suggests that as a greater portion of companies in the economy are acquired by private equity, permanently higher leverage of these companies leads to significantly lower corporate tax revenues for the governments, all else equal.

Non-Leveraged-Based Tax Avoidance Badertscher, Katz, and Rego (2013) study private U.S. companies with public debt and find that private equity-owned companies engage in greater tax avoidance than management-owned companies. Extending this study, Olbert and Severin (2021) study European buyouts and find that target companies' effective tax rates decrease by 15% after the private equity buyout. Targets engaging in post-buyout tax avoidance invest less in physical assets and employment and fit the category of buyouts that create value via cost cutting rather than growth. The authors examine industry-wide real effects and find that private equity ownership reduces overall corporate tax revenues and industry-wide effective tax rates without creating positive spillovers for other tax bases (e.g., consumption tax). Together, these findings suggest that some private equity investors impose a negative externality on local domestic governments through increased tax avoidance.

In a study of private equity investments in life insurance companies, Kirti and Sarin (2020) also report that private equity-owned insurers aggressively engage in tax arbitrage by reinsuring their contracts with subsidiaries domiciled in tax havens with 0% corporate tax rates.

Collectively, these papers suggest that minimizing tax payments is one of the value-creation strategies pursued by private equity owners, especially for companies with moderate growth prospects, and this has a potential negative effect on domestic government tax revenues.

Indirect Effects on Governments and Taxpayers Before the Financial Crisis of 2008–09, poorly-rated private-label ABS holdings required a higher capital charge. But in the aftermath of the Crisis, insurance regulators exempted insurers from this capital charge requirements to prevent massive fire sales of downgrade private-label ABS by insurers. Becker, Opp, and Saidi (forthcoming) and Koijen and Yogo (2016) document that U.S. insurance companies, under pressure for reaching-for-yield in a low-interest environment, exploit this regulatory forbearance by holding high-yielding ABS while avoiding capital charge.

With these industry dynamics as a backdrop, Kirti and Sarin (2020) study private equity ownership of life insurance companies and find evidence that private equity ownership exacerbates this regulatory arbitrage incentive. The authors document that acquired insurers aggressively engage in regulatory arbitrage by selling high-rated but low-yielding corporate bonds and buying poorly-rated and high-yielding ABS within days of the buyouts. The compositional changes of their portfolios increase profitability of the private equity-owned insurers but elevates the riskiness of their portfolios and may exacerbate a hidden cost on taxpayers in the event of distress or failures of these insurers.

This finding echoes the findings of Eaton, Howell, and Yannelis (2020), which show that private equity ownership exacerbates the distortions in the regulatory framework exploited by for-profit schools targeting students who receive federal aid. Since student defaults are guaranteed by the federal government, for-profit schools lack incentives to enable students to acquire enough earning power to repay the loans or to keep the loan amount down at a sustainable level. Similarly, since insurance companies are not punished via higher capital requirements to hold risky ABS after the removal of regulatory capital requirements for ABS in 2009, their incentives are distorted to hold high-yield ABS without regard to their credit risk. While all for-profit schools and insurers are given distorted incentives, private equity ownership is shown to induce more aggressive exploitation of the regulatory arbitrage opportunities.

As a counterpoint, Johnston-Ross, Ma, and Puri (2020) study private equity participation in the failed bank resolution process during the 2008-2009 Financial Crisis and find that private equity acquirers helped stabilize the financial system by providing capital to failed bank resolutions and saving taxpayers resolution costs in the process. The authors find that private equity investors acquire banks in poorer health and in need of greater capital injection ex ante, and yet these banks recover better (i.e., keep branches open and re-grow deposits). The private equity owners are repeat bank acquirers and introduce highly experienced and skilled management teams to failed banks, often with turnaround expertise. The authors estimate that private equity acquisitions allowed the FDIC to reduce the resolution costs by $3.63 billion.

It is interesting that even in the highly regulated and subsidized industry of banking, private equity incentives and the government incentives seem to be better aligned in the case of failed bank resolution during the crisis, whereas they appear to be more misaligned in for-profit healthcare and education. What determines the degree of (mis)alignments between private equity and public interests, and what policy interventions, if any, can mitigate them, is an important avenue for future research.

6.3 Impact on the Environment

As discussed in 2.5 and 3.3, a growing share of limited partners in private equity funds require that ESG be incorporated into the funds' investment processes. Whether their motivations are materiality-driven or impact-driven, limited partners who invest across public and private assets increasingly demand to know whether private portfolio companies that private equity funds invest in promote good environmental practice. The empirical evidence on this question is currently quite limited, and there is an acute need for more research. The question on private equity's role on the environment relates to a broader and growing literature on green banking and investor responsibility for monitoring the environmental impact of projects or companies that they fund.

Shive and Forster (2020) study mandated disclosures of greenhouse gas emissions of U.S. companies and find that, while private independent companies pollute less and are less likely to incur EPA violations than their public counterparts, private equity-owned companies do not differ from public companies in their emissions and violation rates. For a subset of utility companies for which reduction in emissions is shown to be costly and for which electricity output is measurable, the results hold after scaling, suggesting that public and private equity-owned companies eschew the costly pro-environmental actions and choose instead to narrowly maximize profits, going close to the legal limits and thus incurring more actions and violations from the EPA. In contrast, independent owners appear to take more costly pro-environmental actions relative to their counterparts. In light of the argument by Hart and Zingales (2017), see Section 3.3, the findings are consistent with the view that both the public company management and private equity-backed company management do not internalize pro-environmental shareholders' welfare, at least in the sample period of 2006-2017. It is possible that the environmental impact of portfolio companies' real activities was not a salient concern for limited partners in most of the sample period, and it would be interesting to see if private equity responds differentially (relative to public companies) to the heightened concerns for ESG performance among institutional investors in the post-Paris Accord era.

Bellon (2020) studies satellite imaging and administrative datasets for fracking wells to study the impact of private equity ownership on pollution decisions at individual well locations. On average, private equity ownership leads to a significant reduction in use of toxic chemicals for extraction and CO2 emissions from flaring. However, this average effect hides significant heterogeneities. Portfolio companies increase pollution in locations and periods where environmental liability risk is low, such as when the environmental regulation on federal land was rolled back. Overall, high-powered incentives to maximize shareholder value may benefit environmental outcomes when the risk of environmental regulation is high.

These studies confirm the insights from other studies of private equity firm behavior in regulated industries: high-powered incentives of private equity owners is a double-edged sword, and can either powerfully aid the policy goals when incentives are well aligned with the policymakers' intended goals (e.g., failed bank resolutions), or significantly exacerbate the distortion in the framework when incentives are misaligned (e.g., federal aid capture, oligopolistic price bargaining between hospitals and insurers, capital regulation forbearance in insurance, and roll-backs of environmental regulation on federal land). Collectively, the emerging evidence suggests that regulators need to consider the impact of the high-powered incentives of private equity when assessing the market impact of a given regulatory policy or decision.

6.4 Impact on Innovation and Industry Spillovers

As discussed in Section 5, the impact of private equity ownership on the company's real outcomes diverges between public-to-private and private-to-private deals. The shareholder value-creation proposition for public-to-private deals tends to be centered around efficiency gains and cost cutting. This is in contrast to the relaxation of capital constraints and top-line growth for private-to-private deals. This raises a question on the aggregate impact of private equity penetration on industry-wide innovation level, and whether the sign of the impact depends on the composition of public and private companies in an industry. A related second questions is whether public targets' pre-deal level of innovation is optimal, either from shareholders' or societal perspective.

Public-to-Private Deals

Lerner, Sorensen, and Stromberg (2011) study U.S. public-to-private buyouts and find that, while the level of patenting is unchanged post-buyouts, the patents in the post-buyout programs are better cited, and more narrowly focused. Ayash and Egan (2019) study U.S. public-to-private buyouts using a difference-in-difference approach and find that, compared to the matched control companies, private equity-owned companies reduce patent flows by one third, driven by both a

decline in new patents (23%) and fewer purchases (7%). The difference in inferences between the two studies stems in part from the fact that patenting level generally increased over time in the sample period. In a contemporaneous study, Cumming, Peter, and Tarsalewska (2020) study international public-to-private buyouts and find that private equity-backed buyouts are associated with a significant reduction in patents, patent citations, and innovator employment.

Private-to-Private Deals

Amess, Stiebale, and Wright (2016) study UK private equity buyouts and find that for private-to-private deals, quality-adjusted patent stocks increase by 14%, accompanied by relaxation of financial constraints. In contrast, quality-adjusted patent stocks weakly decline in the case of public-to-private deals. The findings are consistent with the view that private-to-private deals tend to provide growth equity, employ less leverage, and target smaller companies that hold growth options but are capital constrained. Driver, Kolasinski, and Stanfield (2021) find that private equity-held firms, though equally innovative as other private firms, skew their strategies toward development and away from research; however, their study does not differentiate between public-to-private and private-to-private deals.

Aggregate Impact

The divergent findings for public-to-private and private-to-private deals on innovation suggest that the aggregate impact of private equity penetration on a given industry depends on the composition of public and private companies in an industry that become private equity targets. An industry where private equity targets are primarily public (private), all else equal, is expected to experience an aggregate decline (increase) in innovation activities after an increase in private equity ownership. Since this composition varies from sector to sector and country to country, the average impact across industries or countries is a priori ambiguous. The impact can also change over time, as the composition changes.

There is a related older literature that documents a negative relationship between indebtedness and innovation for publicly-traded companies and for public-to-private transactions (Baysinger and Hoskisson 1989; Hall 1990; Long and Ravenscraft 1993). According to these studies, it is the elevated leverage rather than the private equity ownership that negatively impacts the company's propensity to invest in long-term and hard-to-assess investments in innovation. It is important to note that the debate on this question during the 1990's was tempered by the fact that private equity targets were mostly old-economy sector companies whose level of innovation was low even before the buyout. Since most innovative companies in the economy, e.g., Silicon

Valley tech companies, were not suitable LBO targets, the impact of private equity acquisition on the aggregate economy was thought to be limited. For example, Hall (1989) argued that "[e]ven if all of this R&D spending went away after going private, this would make a very small dent in overall industrial R&D."

In contrast, today's private equity invests in every sector of the economy, including IT and healthcare, and many of the buyout deals in these high R&D-intensity sectors employ leverage. For example, in 2021 about 40% of U.S. private equity deal values were in IT and healthcare sectors (PitchBook 2022). Enterprise software companies, for example, have become prime buyout targets as the SaaS, or Software-as-a-Service business model has become the industry norm and given management more tools to smooth out cash flows across periods. This is a recent phenomenon, and the literature has not closely examined the effect of either private equity ownership or higher leverage on innovation in high-tech industries. As the share of these high R&D-intensity companies and sectors in the economy grows rapidly, the aggregate effect of private equity penetration in these sectors on the innovation of the portfolio companies themselves and spillover effects on competitors remains an open question.

6.5 Pro-ESG Investing and Private Equity

One of the recurring findings on the impact of private equity on the broader society and the environment is the importance of aligning shareholder preferences with the broader public interest. Any misalignment due to distortion in the regulatory framework tends to be magnified under private equity ownership because of the high-powered incentives of the private equity management model to maximize shareholder value.

What if investors in private equity funds have explicitly prosocial incentives and impose their preferences on the private equity management model? Impact funds are private equity and VC funds that explicitly pursue dual objectives of both financial return and generation of positive (either social or environmental) externality. In essence, much like how nonprofit hospitals may internalize the positive externality of provision of quality healthcare in the local community as nonpecuniary benefit, impact funds aim to internalize the positive externality that the fund's portfolio companies generate as nonpecuniary benefit to fund investors. As investors pressure for-profit companies to adopt prosocial practice, e.g., net-zero pledges to fight climate change, a debate arises as to how for-profit companies can credibly commit to such pledges that are costly and impact profits negatively. Will the private equity fund mechanism work more or less effectively than the public company governance mechanism to induce prosocial behavior in the portfolio companies? What will be the return implications of imposing such preferences on fund activities?

Broccardo, Hart, and Zingales (2021) study voting and exiting as two strategies employed by prosocial investors and consumers to pressure companies to choose clean (vs. dirty) technology.[4] The authors build a model that is meant for public companies and advocate for proxy voting as a more effective mechanism to induce clean technology adoption than divestment. However, in practice it may be hard to implement a proxy voting solution to gather the collective preference of public company investors who are free to trade the stocks at a moment's notice. In contrast, the closed-end fund structure, a small and fixed set of limited partners, and illiquidity of fund interests create a more stable structure in which to articulate the prosocial goal of the fund and execute a long-term strategy to adhere to the goal. Limited partners will then vote with their feet when it is time to decide whether to re-up for the next fund the general partners raise, based on the combined financial and non-financial (environmental and/or social) performance of the first fund.

Geczy, Jeffers, Musto, and Tucker (2021) study limited partnership contracts of impact funds and find that impact funds give limited partners advisory roles that enable them to perform substantial oversight over deal selection, due diligence, conflict of interest, and other material fund activity. At the same time, the study finds that impact funds typically do not tie manager compensation explicitly to impact outcomes. The use of informal governance rather than explicit contracting to monitor impact performance raises several questions: Is this contracting form optimal or a reflection of a still nascent and rapidly evolving industry? Does it indicate the inherent difficulty of impact measurement, or uncertainty about the relationship between impact and financial performance and investors' ambiguity towards the trade-off? Clearly, more research is needed to answer these questions.

Pastor, Stambaugh, and Taylor (2021) analyze financial and real effects of sustainable investing in an equilibrium where (i) companies can either create positive (green) or negative (brown) externality and (ii) investors derive utility (disutility) for holding green (brown) assets, care about companies' aggregate social impact, and care about climate risk. In the model, pro-ESG investors' willingness to forgo return in exchange for investing in green-tilted portfolio lowers green companies' cost of capital. Climate risk also increases brown companies' expected return. Pro-ESG investors enjoy "investor surplus" despite earning negative alpha. This equilibrium framework is useful in understanding expected financial returns of impact funds.

[4] Also see Pursiainen and Tykvova (2021) for a study of how customers "vote with their feet" in response to announcements of buyouts of retail brands.

Impact fund investors derive utility from holding impact funds that generate positive impact, and thus are rationally willing to invest in them even though their expected financial return alone may be lower than that from investing in non-impact private equity funds.

Taking this insight to the fund-level financial performance data, Barber, Morse, and Yasuda (2021) estimate random-utility/willing-to-pay models and find that limited partners accept 2.5-3.7 ppts lower IRRs ex ante for impact funds, compared to comparable non-impact funds. The result is consistent with the view that investors derive nonpecuniary utility from investing in impact funds, thus sacrificing financial return. Development organizations, foundations, financial institutions, public pensions, Europeans, and United Nations Principles of Responsible Investment signatories have high willingness-to-pay for impact. Unpacking the channels behind this heterogeneity across investor types, the authors find that, on one hand, investors with mission objectives and/or facing political pressure have high willingness-to-pay; on the other hand, those subject to fiduciary duty-related restrictions against dual-objective investments are reluctant to invest in impact funds, likely for fear of running afoul of the regulation. These results are consistent with the predictions for pro-ESG investors in Pastor, Stambaugh, and Taylor (2021): pro-ESG investors earn negative alpha in expectation but are rationally willing to do so because of nonpecuniary utility they derive from holding impact funds in their portfolios.

Do impact funds actually generate positive externalities? Does the externality they generate correlate positively or negatively with the fund's financial returns? And within a given fund, does the externality each portfolio company investment generates correlate positively or negatively with the fund's financial returns from the investment? How does a fund measure the externality generated at each portfolio company, and how does the company attribute the externality generated to the investment by the impact fund vs. other investments it receives? These are just examples of a myriad of questions that remain open and are fruitful areas of future research.

7. OPEN QUESTIONS AND SUGGESTIONS FOR FURTHER RESEARCH

As discussed throughout the chapter, many questions remain open for future research and are summarized below.

Why do private equity-backed companies tend to exploit regulatory arbitrage and tax avoidance more aggressively than non-private equity-backed peers? Faccio and Hsu (2017) suggest that some private equity firms may benefit from political connections. Do such connections also enable them to pursue either regulatory capture or tax avoidance more successfully or at lower cost?

In regulated or subsidized industries, distortion in incentives given by the regulatory framework tends to get magnified when combined with high-powered incentives of private equity. What policy interventions, if any, can mitigate the misalignment of incentives between private equity and public interests?

While in the past private equity deals are concentrated in low-tech, consumer or industrial sectors, today more than a third of private equity investments are in IT and healthcare, the most innovation-driven segments of the economy. What is the aggregate impact of private equity's greater presence in the tech industry on innovation? Does it depend on the composition of public-to-private vs. private-to-private deals? What else matters?

How should impact funds govern and provide incentives for impact generation at the portfolio companies? If implicit rather than explicit contracting is optimal, what is the underlying mechanism? This is a broader question for governing ESG practice at public and non-private equity-backed private companies, too, and there is a potential for innovating on contracting that may have broader applicability for aligning shareholder preferences with the broader public interest.

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