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Financing Human Capital: A Survey and Synthesis

Finance Working Paper N° 1073/2025
September 2025

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University of Mannheim and ECGI

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Abstract

This article surveys a large body of literature that investigates the relationship between corporate finance developments and human capital. Human capital has become increasingly important as a factor of production for firms, where it now rivals physical capital, and as an asset, which constitutes a substantial proportion of wealth in modern economies. The increased importance of human capital has been linked to several trends in corporate finance and corporate governance: firms rely less on debt and public markets, hold more cash, and conserve cash through their payout policies. The literature has established multiple mechanisms, which suggests that the link between these trends is causal. The key insight is that firms manage two types of constraints that intricately depend on each other: financial constraints and human resource constraints. Contractual solutions, ownership structures, and power-sharing arrangements between investors and employees emerge as secondbest solutions to balance these constraints. The article then takes a more dynamic perspective and argues that resource constraints and optimal governance arrangements necessarily change over the life cycle of the firm. This part discusses start-ups, the increasingly delayed decision to go public, private-equity buyouts, and M&As, and argues that firms change ownership and governance structures as they prioritize different constraints over the course of their life cycle. The final part shows how human capital is reflected in stock prices, which incorporate the value of human capital investments and employee relations, albeit only partially, which may potentially lead to underinvestment. Moreover, human capital constraints increase risk, which is priced in financial markets. The conclusion offers some reflections on the theory of the firm and provides a tentative outlook on future research.

Keywords: corporate finance; human capital; financial constraints; M&As; private equity; capital structure; corporate governance

JEL Classifications: G24, G32, G33, G34, G35

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Abstract

This article surveys a large body of literature that investigates the relationship between corporate finance developments and human capital. Human capital has become increasingly important as a factor of production for firms, where it now rivals physical capital, and as an asset, which constitutes a substantial proportion of wealth in modern economies. The increased importance of human capital has been linked to several trends in corporate finance and corporate governance: firms rely less on debt and public markets, hold more cash, and conserve cash through their payout policies. The literature has established multiple mechanisms that connect these trends, which suggests that the link between them is causal. The key insight is that firms manage two types of constraints that intricately depend on each other: financial constraints and human resource constraints. Contractual solutions, ownership structures, and power-sharing arrangements between investors and employees emerge as second-best solutions to balance these constraints. The article then argues that resource constraints and optimal governance arrangements necessarily change over the life cycle of the firm, which gives rise to different ownership and governance structures. This part discusses start-ups, the increasingly delayed decision to go public, private-equity buyouts, and M&As, and argues that firms change ownership and governance structures as they prioritize different constraints over the course of their life cycle. The final part shows how human capital is reflected in stock prices, which incorporate the value of human capital investments and employee relations, albeit only partially, which may potentially lead to underinvestment. Moreover, human capital constraints increase risk, which is priced in financial markets. The conclusion offers some reflections on the theory of the firm and provides a tentative outlook on future research.

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1 Introduction

This article provides a survey of research on the role of human capital in corporate finance. Human capital and associated intangibles like "organizational capital" or "knowledge capital" have become increasingly important in modern economies, and, by some measures, more important than physical assets. At the same time, human capital is arguably the most important asset for the majority of individuals, and by some accounts forms more than 90% of aggregate wealth in the economy, about one order of magnitude larger than financial wealth (Lustig, Van Nieuwerburgh, and Verdelhan, 2013; Palacios, 2015). This shift toward human capital has been associated with several trends in corporate finance: the capital structure of firms has moved toward less leverage and more cash; payout policy has shifted toward repurchases and lower payouts; and firms delay IPOs and rely less on public markets. Similarly, in governance, the balance of power within firms has moved away from investors toward entrepreneurs in young firms and in the opposite direction for mature public firms. A large literature at the interface of financial economics and labor economics investigates and connects these trends. The emerging picture is that shifts in corporate finance can only be understood in connection with the increased importance of human capital.

Section 2 begins by summarizing the secular trends in human capital and corporate finance. However, trends may be correlated without much of a causal connection between them. Accordingly, Section 3 moves from a time-series to a more cross-sectional perspective and asks which economic mechanisms – if any – may drive these trends in human capital and corporate finance. The argument in this section has three parts and begins with the extended trade-off theory of capital structure, which incorporates the risks to the human capital of firms' employees. Since employees anticipate future losses to their human capital if firms enter financial distress, they pass on these expected utility costs to their employers through higher wage demands. This theory predicts that firms reduce net leverage, which is well supported by empirical research, thus connecting the trends in human capital to those in capital structure. The second part shows that frictions in labor and capital markets expose firms to constraints on their financial as well as their human resources. These constraints are linked: firms with less access to finance are also less attractive employers, which exacerbates human-capital constraints; conversely, limits to firms' hiring ability reduce their future cash flows and firm value, and thus their ability to raise capital. Financial constraints and informational frictions reduce collateralized lending and can render borrowing from employees through deferred compensation a cheaper source of finance. Then, deferred compensation contracts bias firms' payout policy from dividends to share repurchases, thus linking human capital to payout policy. Moreover, with financial constraints, firms hold precautionary cash as collateral for employees' future wage claims, thus increasing cash holdings and reducing overall payouts. The third part of Section 3 begins with the observation that firms and employees cannot

resolve these frictions through long-term contracts. Employees cannot commit to such contracts because human capital is inalienable, and firms cannot commit either if they face binding resource constraints. Second-best solutions include the delegation of decision-making to managers or owners whose preferences allow them to uphold long-term commitments but in a flexible way that respects the constraints of firms and employees, or some type of power-sharing, such as codetermination, unionization, or employee share ownership. Absent such institutions and contractual solutions, firms and employees rely on relational, self-enforcing contracts established in repeated interactions. Moreover, institutionalizing power-sharing agreements may entrench one of the parties such that firm value no longer maximizes the combined value of investors and employees.

Section 4 adopts a dynamic perspective and tracks how firms prioritize different constraints over time, and how corporate financing and ownership arrangements change over the life cycle of the firm. This dynamic perspective is important for two reasons. First, since firms are subject to interlinked financial and human-resource constraints, their choices of organizational form and ownership structure often have to prioritize one of these constraints at the expense of the other. Second, as emphasized in Section 3, the balance of power between investors and employees may become suboptimal, either because one party engages in opportunism, or because the optimal mode of cooperation between investors and employees shifts as firms accumulate resources and relieve constraints.

The discussion of life-cycle stages begins with the literature on human capital in start-ups. They require complementary inputs to simultaneously convince investors that they have sufficient access to human capital, and prospective employees that they have sufficient funding to honor commitments to employment relationships. The emerging picture is that start-ups prioritize human-resource constraints and pay higher wages to attract talent that would otherwise go to safer and more mature firms. Start-ups increasingly delay the decision to go public. One of the key insights from the literature is that while access to public markets relaxes financial constraints, it potentially exacerbates constraints in the labor market because it enhances labor mobility. Hence, to the extent that private firms offer a better environment for the protection and creation of intangible capital, delaying the decision to go public becomes attractive to some firms, a choice that has also been facilitated by the increased availability of private equity to younger firms ("growth equity").

Private equity buyouts sometimes reverse the decision to go public and, in other cases, offer an increasingly attractive alternative to public ownership for start-ups. It appears that private equity buyouts are associated with creative destruction, technology adoption, improved access to finance, as well as improved human capital management. Interestingly, while public perceptions of buyouts by financial investors are often negative, the academic literature is more nuanced and documents heterogeneous effects, as different types of buyouts address different constraints: these may be

financial constraints, a lack of professionalism in management, or a resistance to modernization. Since empirical research in this area often does not distinguish between the very different types of private-equity buyouts and their relation to firms' life cycle, drawing firm conclusions from this research remains difficult.

Mergers and acquisitions are a type of transaction that is very heterogeneous in itself. However, all types of M&As have in common that labor restructuring is critical for their success. The discussion distinguishes four types of labor-related synergies: eliminating overlapping operations and duplicate jobs in consolidating mergers; exploiting complementary skills of acquirers' and targets' workforce; transferring organizational and technological capabilities; and acquiring firms for their workforce ("acqui-hiring"). In addition, M&As may create dyssynergies by inducing workers to leave the firm. Other effects that have been related to M&As, e.g., transfers of wealth at the expense of other stakeholders, or the exploitation of monopsony power over workers in local labor markets, should probably be considered side effects of the motives captured by the four sources of synergies summarized above. This section finishes with a reflection on the notion of dynamically optimal ownership structures and makes the case for adopting a life-cycle perspective in empirical research.

Section 5 takes the perspective of financial investors. Sustaining a functioning cooperation between investors and employees generates future cash flows to investors, and extant work in this area shows that financial markets do value human capital and organizational capital: better human resource policies, trust of employees in management, and investments in training the workforce are all capitalized into the stock price, albeit only partially, which may create insufficient incentives to invest in these intangible assets. At the same time, maintaining access to human capital and retaining key employees becomes a risk factor for investors in human-capital-intensive firms. Similarly, the limited commitment of the implicit contracts employees have with the firm creates human capital risk, which employees may try to hedge in financial markets. Empirical work in asset pricing suggests that human capital-related risks are priced in financial markets, which creates additional trade-offs. For example, firms may be able to overcome some labor-related frictions by entering long-term commitments. However, these commitments increase operating leverage, which in turn increases firms' cost of capital and thus the value of entering such commitments.

Finally, Section 6 offers some additional reflections. It advocates a life cycle perspective in empirical research, discusses building blocks of a theory of the firm that integrates human capital and accommodates employment relationships, and highlights some limitations and avenues for future research in addition to those mentioned throughout the article.

There are several surveys with a close relation to the topic of this article. Pagano and Volpin (2008) cover earlier papers and set the research agenda by motivating and inviting more research in the field. The surveys of Matsa (2018), Pagano (2020), and Olsson and Tåg (2025a) focus, respectively, on capital structure, on risk-sharing between firms and employees, and on private equity, all three of which form important parts of the field. While this survey overlaps with these articles, its scope is broader and puts all of these issues into a different context. Nishesh, Ouimet, and Simintzi (2022) cover ownership changes, capital structure and financial distress, technology, and inequality. Their focus is almost exclusively empirical, whereas this survey gives ample room to theory to frame empirical results.

While the scope of this survey is broad, it still leaves out material that could legitimately be covered. To begin, this article only reviews work on how firms finance investments into their workforce and assets generated with human capital, taking a micro-economic perspective; as such, it leaves out several areas of research at the interface of financial economics and labor economics that take a different perspective: work in household finance on how individuals finance their investments into their human capital and the role of the social security system; work that emphasizes the perspective of individual employees and their careers, welfare, and job assignments; work from a broader macro perspective that focuses on business cycle dynamics and the job reallocation across firms and industries.[2] Papers in these areas are covered only to the extent that they touch on the main themes in this survey. Furthermore, the discussion here touches on several areas of research in labor economics (e.g., labor mobility or technological change) or in corporate finance (e.g., IPOs or M&As) that are relevant for the discussion here but have also generated many important insights that reach beyond it. Accordingly, these strands of the literature are only covered to the extent that they contribute to the overarching theme of this article. I redirect the reader to related papers or surveys that cover these bordering areas whenever I am aware of them. In some cases, I had to make arbitrary decisions on which areas to cover more deeply and which areas to cut short or omit altogether. Specifically, the alignment of incentives through stock and stock options granted as a part of executive compensation contracts is also an important part of firms' human capital, but these issues constitute a separate literature in its own right that has already been the subject of multiple surveys, e.g., Core, Guay, and Larcker (2003), Abowd and Kaplan (1999), Frydman and Jenter (2010); Edmans and Gabaix (2016), and Rau (2017). Other fields with which this survey has a significant degree of overlap are

[2] See Ellul, Pagano, and Schivardi (2018) and Olsson and Tåg (2025b) on the role of unemployment insurance. García-Gómez, Maug, and Obernberger (2025) also consider health insurance, disability insurance, and retirement benefits; Jayaratne and Strahan (1996) and Beck, Levine, and Loayza (2000) study the finance-growth nexus, and Bai, Carvalho, and Phillips (2018) analyze how banks contribute to productivity improvements and labor reallocation.

organizational capital and management practices, the economics of intangible assets, especially regarding innovators' human capital, entrepreneurial finance, and discrimination and inequality.[3]

2 Trends in human capital and corporate finance

This section summarizes some of the major trends in the development of human capital and corporate finance. Section 2.1 describes the substantial increase in the accumulation of intangible assets, which are created with human capital as a major input. Section 2.2 relates this trend to three trends in corporate finance: the increase in cash holdings, the decline in leverage, and the displacement of dividends by share repurchases. Finally, Section 2.3 shows how the balance of power between investors and the owners of human capital has shifted, and which part of this shift may be related to changes in firms' asset base. This section only describes and loosely correlates these trends, while Section 3 discusses research on the economic mechanisms that may establish causal relationships between these trends.

2.1 The rise in human capital and intangibles

This section discusses how the value and importance of human capital and intangibles have developed over time. These two concepts are closely related but distinct. The value of human capital refers to the value of future earnings that accrue to the owners of human capital, whereas cash flows created by intangible assets accrue to firms' investors. Here, the term "owners of human capital" comprehensively refers to rank-and-file employees as well as to entrepreneurs and managers, but I will often use "employees" for brevity. The production of intangibles requires critical inputs from employees, and firms need to share the returns from these intangible assets with the owners of human capital. Hence, the value of intangibles will be partly reflected in the market value of firms, and partly in the value of the human capital that helped to produce the intangibles, which makes the valuation of intangible assets more difficult (Eisfeldt and Papanikolaou, 2014; Crouzet, Eberly, Eisfeldt, et al., 2022). It is therefore legitimate to assume that the developments of intangibles and human capital are highly correlated.

The valuation of intangible assets has made significant progress in recent years. (See Van Criekingen, Bloch, and Eklund, 2022 and Corrado, Haskel, Jona-Lasinio, et al., 2022 for recent surveys of intangible capital.) One established methodology uses the perpetual inventory method, in which researchers identify those expenses of the firm that are likely to generate future cash flows and should thus be

[3] For these areas of research, see the following surveys: Entrepreneurial finance: Cumming and Groh (2018); Cumming, Deloof, Manigart, et al. (2019); Ewens and Farre-Mensa (2022); intangibles: Crouzet, Eberly, Eisfeldt, et al. (2022); organizational capital and management practices: Bloom and Van Reenen (2010). Inequality is covered in the survey of Nishesh, Ouimet, and Simintzi (2022).

regarded as investments. The stock *N(t)* of an intangible asset (e.g., knowledge capital, organizational capital) is obtained from investments in this intangible asset *I(t)* (e.g., estimated as portions of the firm's R&D or SG&A expenses) through a difference equation $N(t) = (1 - \delta_N)N(t-1) + I(t)$, where δ_N is the depreciation rate of the intangible asset.[4] While details of methodology and definitions differ across studies, a number of findings appear to be robust. Studies of this topic agree on two stylized facts. First, intangible assets form a substantial portion of firms' capital stock: for large samples of US firms, the value of intangible assets is large and now exceeds the value of tangible assets (book values, e.g., Eisfeldt and Papanikolaou, 2014; Ewens, Peters, and Wang, 2025). Second, the relative importance of intangibles has increased over time. For example, Crouzet, Eberly, Eisfeldt, et al. (2022) show that the proportion of their estimate of intangible assets to total assets has increased from about 43% in 1975 to more than 51% in 2021, whereas the measure of Ewens, Peters, and Wang (2025) has increased from 38% to 60% during the period from 1978 to 2017.

Belo, Gala, Salomao, et al. (2022) establish a third and closely-related fact. They investigate which component of firm value is explained by investments in physical capital, labor, and two types of intangible capital. Applying a production-function approach with these four inputs and structural estimation, they show that physical capital accounts for 31% of the market values of firms, labor for 23%, whereas the remaining 46% is accounted for by intangible capital. While these studies differ in the details of their methodologies, they lead to the same overall conclusions. Hence, the importance of assets that have been generated predominantly with human capital is large and has increased substantially in the last four decades.

The rising importance of intangible capital mirrors the decrease in the importance of investments in physical capital. Gutiérrez and Philippon (2017) show that investments in physical capital have declined after 2000 (see also Alexander and Eberly, 2018; Gruber and Kamin, 2015), while Tobin's Q, a measure of investment opportunities, has remained high. Several papers observe and analyze the increasing dissociation of Tobin's Q and investment. Gutiérrez and Philippon (2017) discuss several explanations and find that decreasing competition, tightening corporate governance, and the rise in intangibles all contribute to this development, with the latter accounting for about one-quarter to one-third of the decline in capital expenditures (see also Peters and Taylor, 2017; Lee, Shin, and Stulz, 2022; Ewens, Peters, and Wang, 2025). Fu, Huang, and Wang (2022) report declining capital expenditures for several

[4] See, for example, Corrado, Sichel, and Hulten (2005); Corrado, Hulten, and Sichel (2009); Eisfeldt and Papanikolaou (2014); Peters and Taylor (2017); Crouzet, Eberly, Eisfeldt, et al. (2022); and Ewens, Peters, and Wang (2025) for applications of this approach. The time series can be started by assuming the value of the intangible asset in some baseline year before the beginning of the sample period (e.g., Corrado, Hulten, and Sichel, 2009) or from market prices about realized goodwill in acquisitions in a later year (Ewens, Peters, and Wang, 2025).

developed economies but not for emerging markets, and attribute them to technological change that emphasizes intangible relative to physical capital. Finally, Barkai (2020) decomposes companies' income into the labor share, the capital share, and "pure profits" and finds that accounting for omitted intangible capital can only partially but never fully explain declining labor shares and that an increasing share of income goes to pure profits.

These developments have already been used to resolve several puzzling findings in macroeconomics, such as the surprisingly good performance of the US economy in the 1990s, the downward trend in the labor income share, and declines in productivity (Corrado, Sichel, and Hulten, 2005; Corrado, Hulten, and Sichel, 2009; Crouzet, Eberly, Eisfeldt, et al., 2022). The next two sections relate the growing importance of human capital and intangible assets to patterns in corporate finance and corporate governance.

2.2 Trends in corporate finance and intangibles

2.2.1 Cash holdings

One of the puzzling trends in corporate finance is the secular increase in cash holdings and the corresponding decline in net leverage. Bates, Kahle, and Stulz (2009) report an increase of average cash ratios for US firms (cash and marketable securities divided by the book value of total assets) from 10.5% in 1980 to 23.2% in 2006, which is associated with a dramatic decline in net leverage (debt minus cash) from 16.4% to -1.0% over the same period. Relatedly, Strebulaev and Yang (2013) document an increase in the prevalence of firms with zero debt has increased steadily from about 5% of firms in the 1970s to 19.5% in 2009. Several papers that analyze these patterns have singled out the precautionary motive for explaining this trend (e.g., Acharya, Davydenko, and Strebulaev, 2012) and attribute it to selection effects in favor of high-tech and R&D-intensive firms.[5]

Falato, Kadyrzhanova, Sim, et al. (2022) establish a causal link between the trends in human capital and cash holdings by developing a Q-investment model, extending it by incorporating tangible as well as intangible capital, and then calibrating it to US data for the period from 1970 to 2010. They construct estimates for the value of intangible capital using the perpetual-inventory method as described in the previous section and estimate a structural model in which firms combine tangible with intangible capital, but only tangible capital can serve as collateral.[6] They show that three-quarters of the increase

[5] E.g., Graham and Leary (2018); Opler, Pinkowitz, Stulz, et al. (1999); Begenau and Palazzo (2021); Booth and Zhou (2013); Pinkowitz, Stulz, and Williamson (2016).

[6] This assumption can probably serve only as a first-order approximation. The evidence in Mann (2018) shows that patents may partially serve as collateral. He (2025) shows that intangibles have significant collateral value because they allow firms to borrow against future cash flows, even though the collateral value of intangibles is still only about half of that of tangible assets according to her estimates.

in cash holdings – from 10.0% to 18.3% for their sample – can be explained by the rise of intangible assets alone. Their findings suggest that the concentration of intangibles in high-tech and R&D-intensive firms can explain why higher cash holdings are concentrated in these firms.

2.2.2 Capital structure

The decline in cash holdings is mechanically related to a decline in net debt (debt minus cash), but gross debt declined as well. The data of Graham and Leary (2018) span almost a century, and they show that by 2008, long-term debt had declined by 12.7% and short-term debt by 38.6%, relative to their respective peaks in 1978.[7] Bates, Kahle, and Stulz (2009) also report a slight decline in gross leverage from 26.9% to 22.1% for their sample period. Falato, Kadyrzhanova, Sim, et al. (2022) show a qualitatively similar result and show that the rise in intangibles accounts for the decline of leverage in their Q-model, which would have predicted an increase in leverage had intangibles stayed constant over time. Moreover, their model cannot only account for the decline in leverage but also for the rise in the total amount and frequency of equity issues. Relatedly, Benmelech, Kumar, and Rajan (2024) show that the share of secured debt has declined in relation to total corporate debt and attribute this finding, at least partially, to borrowers' increased demand for financial flexibility. However, an alternative explanation may be the declining availability of tangible assets that can serve as collateral, so that firms borrow against future cash flows rather than assets (Choi and Cook, 2024; He, 2025). Liu, Zheng, Xu, et al. (2023) document the negative relationship between human-capital reliance and leverage for Chinese data.

In a related paper, Dell'Ariccia, Kadyrzhanova, Minoiu, et al. (2020) study how the increase in intangible assets has affected bank lending. They show how commercial and industrial lending by US banks has declined substantially over the 1984-2016 period, both as a percentage of the loan portfolios of commercial banks and relative to firms' capital stock. Instead, banks have increased their real-estate lending.[8] The cross-sectional analysis of the paper shows that banks in locations with stronger growth in intangibles also see a larger decline in commercial and industrial lending and a correspondingly larger increase in real-estate lending. The authors conclude that the decline in the tangibility of assets explains 30% of the decline in banks' commercial lending. They further argue that banks exposed to stronger local growth in intangibles experience fewer lending opportunities to firms and substitute for

[7] See Graham and Leary (2018), Table 1, Panel C. The table reports the proportion of long-term (short-term) debt of total assets as 19.58% (7.23%) in 1978 and 17.09% (4.44%) in 2008 in their extended sample, which covers „all nonfinancial unregulated firms in the Moody's Variable Industrial Manual."

[8] See Jordà, Schularick, and Taylor (2016) for a systematic documentation of increased mortgage lending in OECD countries and Döttling and Perotti (2020), who link the increase in mortgage lending to the private sector to the secular decline in unskilled wages.

these through increased real-estate lending, thus establishing a link between the trend to intangible capital and banks' lending policies.

2.2.3 Payout policy

The rise in intangibles and human capital can also be associated with changes in payout policy, but this connection has not been studied as extensively as the connection with cash holdings and leverage. In one of the few empirical contributions, Nguyen and Qiu (2022) show that firms with more skilled labor are more reluctant to pay dividends, which may help to account for the general decline in dividend payouts and in the number of firms paying dividends (e.g., Farre-Mensa, Michaely, and Schmalz, 2014). Döttling, Ladika, and Perotti (2025) conclude from their theoretical model that intangible-intensive firms should prefer share repurchases over dividends. Their hypothesis can be supported by combining two empirical findings. The first finding relates repurchases to equity-based incentive pay. In their review of the literature on payout policy, Farre-Mensa, Michaely, and Schmalz (2014) restate the well-known fact that share repurchases have displaced dividends as the prime channel through which companies pay out cash to their shareholders. They argue that traditional theories of payout policies based on asymmetric information, agency considerations, and taxes can adequately account for the cross-sectional variation in payout policies across firms, but have little power in explaining the secular trend toward repurchases. Instead, they conclude that this trend is better explained by the increased importance of equity-based pay in management compensation, because repurchases reduce the dilution of earnings per share, a performance indicator in many compensation contracts, whereas dividend payouts reduce the value of executive stock options. The reverse causality may also apply: firms use repurchases to increase the pay-for-performance sensitivity of equity-based pay.

The second finding is that the concern for the value of equity-based pay applies not only to executives but also to many skilled employees. Specifically, Eisfeldt, Falato, and Xiaolan (2023) show that for "employees who receive significant equity-based compensation" ("human capitalists"), this form of compensation accounts for 36% of their pay, and that 78% of equity-based pay went to non-executive employees. Moreover, not accounting for the significant portion of labor income leads to misrepresentations of trends in the share of labor in value added. Combining these two findings supports the hypothesis that the secular displacement of dividends by share repurchases may be attributed to the changes in compensation practice and the increased compensation of skilled employees with equity-based pay. Kisgen, Kong, and Fu (2025) address the public concern about a potentially reverse causal relationship that attributes the decline in the labor share to share repurchases but find no evidence.

We can therefore conclude that the displacement of physical with intangible assets is associated with trends to higher cash holdings; lower gross leverage, and thus also lower net leverage; and a shift from dividends to share repurchases, and that the association is likely to be causal for capital structure.

2.3 Trends in corporate governance: Shifts in the balance of power

In addition to the trends in investment policies, cash holdings, capital structure, and payout policies, the balance of power between the owners of human capital and investors has also changed markedly, albeit differently for different groups of firms and for different groups of employees. The power of entrepreneurs and founders has increased relative to that of investors, measured by the control of voting rights as well as their control over corporate boards. Field and Lowry (2022) and Aggarwal, Eldar, Hochberg, et al. (2022) document a rise in dual-class IPOs. This rise can be attributed mostly to IPOs of founder-led firms, whereas the frequency with which other owners (venture capitalists, private equity firms, parent companies that take subsidiaries public) have chosen dual-class structures has stayed constant. Similarly, the wedge between voting shares and non-voting shares has increased over time, and this increase is entirely attributable to founder-led IPOs, which lets Aggarwal, Eldar, Hochberg, et al. (2022) conclude that the rise in dual-class IPOs is driven by a shift in bargaining power, which gives founders the "ability to dictate the governance of IPO firms." These founders put a high value on realizing their unique vision of the firm and protecting themselves against control by investors with different beliefs (see Goshen and Hamdani, 2015). This shift in bargaining power can at least partly be related to the trends discussed above: Lower investment requirements reduce fundraising at the start-up stage, leading to lower dilution of the ownership stakes and increased bargaining power of founders. Section 4.3 also relates it to the increased tendency to delay IPOs. In addition, Aggarwal, Eldar, Hochberg, et al. (2022) and Ewens and Farre-Mensa (2020) note that the increased availability of private funding has increased competition for investments in start-up firms ("more money chasing fewer deals") and thus strengthened the hand of entrepreneurs.

The same factors have also changed the composition of boards of start-up firms. Ewens and Farre-Mensa (2022) find that venture capitalists controlled 37.3% of the boards of their portfolio companies at the early-stage financing round in 2002, a figure that declined to 10.1% in 2019. Ewens and Malenko (2024) show that the same trend holds for later rounds of financing, and that control of the board shifts from venture capitalists to entrepreneurs, whereas the proportion of firms with shared control of the board remains almost constant. Hence, the results on dual-class IPOs and board control in venture-capital financed firms both support the conclusion that the bargaining power in young firms has shifted from investors to entrepreneurs.

However, while recent trends have strengthened the position of entrepreneurs in start-ups, the balance of power in mature firms and those with predominantly institutional investors has shifted in

the opposite direction. Field and Lowry (2022) report a decline of about 40% for the fraction of mature firms with dual-class share structures, suggesting a transfer of power away from founders and entrepreneurs for mature firms. Relatedly, Falato, Kim, and Von Wachter (2022) find that the employment and wages of rank-and-file workers decline if institutional investors become more powerful. They measure the power of institutional investors as the ownership of (the largest) institutional blockholders, defined as investors with an ownership of at least 5% of the firm's shares. Then they show how the increase in institutional ownership led to a decline in employment and payroll, and that these effects occur only for dedicated and activist shareholders but not for quasi-indexers. Hence, the trend toward human and intangible capital has strengthened the role of entrepreneurs and founders, but the opposite seems to be true for rank-and-file employees (see also Hallock, 2009).

Overall, the research summarized in this section documents a strong secular trend away from physical capital and toward intangible assets and associates it with equally salient trends in capital structure and payout policy. However, while it is plausible that these connections are causal, only a few contributions establish causal links. Therefore, the next two sections shift the perspective and collect research that argues for such causal links.

3 Financial contracting and employees

The previous section focuses on the longitudinal trends in corporate finance and corporate governance and argues that they can be connected to the increased importance of human capital. This section changes the perspective from longitudinal to cross-sectional analyses, which provide deeper insights into the mechanisms that may drive longitudinal trends. The argument begins with a discussion of optimal financial contracting that relates frictions in capital and labor markets to capital structure (Section 3.1). The next two sections discuss the human costs of financial distress, which depend on frictions in labor markets (Section 3.2) and on frictions in financial markets (Section 3.3). The argument shows that these frictions interact but could be overcome to the extent that workers and firms can enter long-term contracts. However, the inalienability of human capital prevents workers from committing to such agreements, which creates costs from labor mobility for firms (Section 3.4). Similarly, firms have resource constraints, which limit their ability to commit to binding long-term contracts, and they rely on more flexible second-best arrangements and implicit contracts, which create uninsurable risks for workers (Section 3.5). Alternatively, firms can commit through organizational choices that divide decision-making rights between investors and employees. These may not only lead to improved contracting but also to entrenchment and power struggles within firms (Section 3.6). The last part (Section 3.7) pulls the threads of this entire section together.

3.1 Optimal contracting with human capital

In this section, we ask how firms balance the interests of employees and investors when both sides make significant firm-specific investments into the assets that generate firms' cash flows. The key conceptual framework that empirical studies on this question adopt, explicitly or implicitly, is an extension of the trade-off theory of capital structure. The most significant innovation to this theory relative to its baseline formulation (Kraus and Litzenberger, 1973) is the argument that firms benefit from long-term employment relationships with their workforce by internalizing the costs financial distress imposes on employees, and that protecting employment relationships requires a reduction in leverage.

An early effort in this direction is the theory of Titman (1984), who observes that firms' liquidation policy is time-inconsistent if any stakeholder (workers, customers, suppliers) makes firm-specific investments but does not have the right to decide about future liquidations of the firm. Then the firm's capital structure becomes a bonding device that can, under appropriate conditions, implement the optimal liquidation policy. Jaggia and Thakor (1994) argue that firms need to motivate employees to invest in firm-specific human capital. Creating this motivation only through promising future wage increases may be costly to the firm because employees will anticipate that these wage increases cannot be honored in an insolvency, so that lower insolvency risks would reduce the risk premiums firms have to pay to employees. This consideration reduces optimal leverage because firms give up some tax benefits of higher leverage in exchange for lower wage payments. Blair (1999) makes a related point by highlighting the implications of firm-specific human capital investments but then argues that mechanisms other than capital structure (e.g., severance pay, power-sharing with a union) may address the same problem. Hence, it is attractive to seek explanations of capital structure that do not rely on firm-specific human capital.

Berk, Stanton, and Zechner (2010) take a similar route by incorporating the human costs of financial distress into a theory of capital structure. However, they do not use the notion of firm-specific human capital and instead rely on the theory of dynamic wage contracts of Harris and Holmstrom (1982). This theory assumes only that workers are risk-averse and subject to future shocks to their labor productivity. Firms optimally offer workers partial insurance against these shocks through long-term employment contracts in which wages go up after positive shocks to labor productivity but do not decline after negative shocks. In return, workers accept lower wages. In the model of Berk, Stanton, and Zechner (2010), firms choose optimal debt levels by trading off the benefits of higher tax shields against the additional risk-premium they have to pay workers if these expect a higher likelihood of financial distress, a scenario in which the long-term employment contract cannot be honored. Hence, human-capital-intensive firms have lower leverage, and firms with higher leverage pay higher wages.

3.2 Leverage and the human costs of financial distress

The incorporation of the human costs of financial distress into the trade-off theory of capital structure creates three distinct predictions, which form three steps that build on each other: (1) Bankruptcy and financial distress are costly for employees; (2) wages include a risk premium, which employees charge to firms in anticipation of future financial distress; (3) firms reduce the need to pay such a risk premium by choosing more conservative financial policies. These implications seem robust across models and do not rely on the specific reasons that give rise to human costs of financial distress. In all likelihood, such costs would emanate from any model in which firms benefit from making long-term commitments to workers and workers rely on these commitments, independently of whether long-term employment relationships create benefits because they generate incentives to invest in firm-specific human capital, implement optimal risk sharing, provide access to prestigious jobs (Ferreira and Nikolowa, 2024), or permit firms to engage in talent discovery (Ferreira and Nikolowa, 2022). Accordingly, as of now, I will refer comprehensively to the group of theories that augment the standard trade-off theory by including the costs of financial distress that fall on employees as the *extended trade-off theory* of capital structure. Next, I will discuss the empirical findings on each of the three implications in turn.

Corporate financial distress is costly for employees.

Several studies show that bankruptcies and financial distress are costly for employees. Hotchkiss (1995) notes that employment declines by 50% from one year before bankruptcy to one year after. Graham, Kim, Li, et al. (2023) construct a sample of more than 230,000 workers from 130 US firms that filed for bankruptcy and find that, on average, employees' earnings decline by 14% (not adjusting for unemployment insurance) relative to pre-bankruptcy earnings and benchmarked against a control group of workers from firms that did not file for bankruptcy. They estimate the present value of cumulative earnings losses over six years to be 89% of pre-bankruptcy annual earnings. Araujo, Ferreira, Lagaras, et al. (2023) study employees' careers after bankruptcies and exploit exogenous variation in the inclination of judges to favor firm continuation over liquidation. They find that employees of bankrupt firms whose case is assigned to a one-standard-deviation more pro-continuation judge are eight percentage points more likely to keep their jobs with the bankrupt firm five years after bankruptcy but earn about four percent lower wages. Hence, bankruptcies that result in liquidations reduce employment with the same firm but increase wages. The last finding is surprising, and the authors attribute it to frictions in the labor market, in particular, informational frictions (workers lack information about outside options) and fixed adjustment costs (workers incur costs for changing industries and locations). Considering these unknown costs, the overall impact of bankruptcies on workers is difficult to assess.

These studies focus on how insolvencies affect employees. However, firms may be in financial distress without being technically insolvent, with associated negative consequences for employees (Elkamhi, Kim, and Salerno, 2024). Consistent with this notion, Agrawal and Matsa (2013) find that firms already reduce employment by 16% in the year before they default on their loans. Relatedly, Pedersen (2021) analyzes the impact of a news event in which information that a firm's employees have been exposed to a carcinogen becomes public, which significantly increases the firm's liabilities and probability of bankruptcy. He shows that such an event leads to a wage reduction of about 3.5% for the average employee. Similarly, Falato and Liang (2016) show that covenant violations that lead to debt restructurings imply sharp employment cuts of 18% on average but are much larger in recessions and peaked at cuts of 42% during the Great Financial Crisis from 2007 to 2009. Mirroring this evidence, Agrawal, González-Uribe, and Martínez-Correa (2022) show that a Danish reform of the bankruptcy code that reduced the likelihood of liquidations for some firms, increased employment at the affected firms, and thus benefited employees. All these studies are recent, but they now present convincing evidence that bankruptcies and events that trigger financial distress are associated with significant declines in wages and employment for the employees of the affected firms, whereas events that reduce the incidence of liquidations do the opposite. Financial distress is costly to employees, as well as to firms that are not formally insolvent.

Workers require a wage premium for the risk of financial distress.

The second implication of the extended trade-off theory is that riskier firms are less attractive as employers and that workers charge a risk premium to firms that are more likely to go into financial distress. Brown and Matsa (2016) analyze data from a job search platform and find that firms with a higher likelihood of financial distress, measured by CDS prices and accounting data, attract fewer applicants. Similarly, Gortmaker, Jeffers, and Lee (2022) document that employees initiate more connections on a job-search platform if credit ratings deteriorate. Two complementary studies investigate how employees respond to earnings announcements: Choi, Choi, and Malik (2023) show that positive earnings news encourages prospective job seekers to apply to these firms. Similarly, deHaan, Li, and Zhou (2023) show that positive earnings announcements of their current employer result in lower job search, consistent with the view that employees extract information from these announcements about their employer's financial prospects and tend to leave if these prospects deteriorate. The discussion of labor mobility below complements these findings by showing that distressed firms are likely to lose employees, especially highly-skilled employees. Baghai, Silva, Thell, et al. (2021) show that overlevered firms are more likely to lose employees to other firms: Swedish firms approaching bankruptcy tend to lose workers, and this effect is 65% stronger for highly-skilled employees. Using shocks to the exchange rates of exporting firms as an instrument allows them to infer that this association is causal.

Estimating the risk premium in wages that employees may charge to firms is difficult because it requires a counterfactual, i.e., an estimate of the wage workers would demand if the possibility of financial distress were different from what it is. Several methodologies have been used in the literature to overcome this obstacle. The baseline version of the first methodology simply regresses employee wages on leverage. The results are generally ambiguous and depend on a variety of factors. While Hanka (1998), Cronqvist, Heyman, Nilsson, et al. (2009), and Michaels, Beau Page, and Whited (2019) all find a negative relationship between wages and leverage, Chemmanur, Cheng, and Zhang (2013) show a positive relationship. Moreover, the findings in Hanka (1998) and Michaels, Beau Page, and Whited (2019) suggest that the effect depends on firm size, as it switches signs and becomes positive for small firms. Matsa (2018) observes that these regressions may confound other factors, e.g., the effect of leverage on the bargaining power of unions (see Section 3.6). Graham, Kim, Li, et al. (2023) argue that the wages of incumbent workers are unlikely to adjust and employ a different version of the regression methodology, which restricts the sample to new hires, i.e., employees who move between firms, building on the earlier observation of Brown and Matsa (2016) that job applicants accurately perceive the financial risk of new employers. They find that an increase of leverage by ten percentage points is associated with a wage premium of 59 basis points and report that these findings are consistent with those from their binomial valuation model (see below). Their results (see their Table 9B) reveal the same sign reversal associated with firm size as noted above for earlier studies. Dore and Zarutskie (2022) also perform an analysis of job transitions but account for the non-randomness of the matching process between firms and employees by controlling for the differences in the characteristics of the firm that hires a new employee relative to the firm from which the employee is leaving. They find a consistently positive relationship between changes in wages and the associated changes in employers' leverage for employees who transition between sample firms. The overall picture resulting from the regression-based studies is ambiguous, and this line of investigation deserves further development, probably with better controls for endogeneity and better analysis of the effect of firm size.

A second methodology uses model-based estimates to circumvent the limitations of regression-based approaches. Agrawal and Matsa (2013) calibrate a model that estimates the present discounted value of the indirect costs of financial distress from the additional labor expenses firms incur. To estimate the expected annual labor costs of financial distress, their model combines information about default probabilities for different credit ratings (Altman, 2007), the probability of unemployment given default estimated from CompuStat, data on bond defaults, and the estimated additional wage costs for each unit increase in the likelihood of unemployment (Topel, 1984). These per-period costs are then discounted using a perpetuity model. The authors estimate that, for a BBB (BB) rated firm, these

indirect costs of financial distress amount to 57 (112) basis points if workers are protected by unemployment insurance, and 154 (301) basis points without such protection (see Table 1, column 2). Matsa (2018) recalculates these estimates using a lower discount rate, which leads to estimates that are about two to three times larger (Table 1, column 3). Agrawal and Matsa (2013) compare the estimated labor-related costs to the tax benefits of debt and to the estimates of the costs of financial distress of Almeida and Philippon (2007), provided in columns 5 and 6 of Table 1 below. They conclude that their own estimates of the labor-related costs of financial distress are sufficiently large to account for the estimated differences between earlier estimates of the tax benefits of debt and the expected costs of financial distress.

Table 1: Wage premiums and costs of financial distress. The table reports alternative estimates of the capitalized wage premium, for the tax benefits of debt, and the expected costs of financial distress, all expressed as a percentage of firm value. Column 2 is the third column in Table 10, Panel B of Agrawal and Matsa (2013) (estimates without unemployment insurance). Column 3 is the third column in Table 1 of Matsa (2018) (estimates without unemployment insurance). Column 4 is Column 2 of Table 10A of Graham, Kim, Li, et al. (2023). Column 5 is the first column of Table VI of Almeida and Philippon (2007). Column 6 is the second column ("Benchmark") of Table IV in Almeida and Philippon (2007). The calculations of the row "BBB minus AA" in Columns 2 and 3 are those of the author. All magnitudes are expressed as a fraction of firm value in percent.

Credit rating	**Capitalized value of wage premium**			**Tax benefits of debt**	**Exp. costs of finan. distress**
Source	Agrawal and Matsa (2013)	Matsa (2018)	Graham, Kim, Li, et al. (2023)	Almeida and Philippon (2007)	
(1)	(2)	(3)	(4)	(5)	(6)
AAA	0.02	0.05	0.27	0.47	0.32
AA	0.13	0.29	1.05	2.51	1.84
A	0.16	0.34	1.91	4.40	3.83
BBB	1.54	2.94	3.04	5.18	4.53
BB	1.12	5.06	5.18	7.22	6.81
B	1.59	6.72	7.38	8.95	9.54
BBB minus AA	1.41	2.65	1.99	2.67	2.69

Graham, Kim, Li, et al. (2023) use a model-based approach that capitalizes future losses from bankruptcies. Their approach differs from that of Agrawal and Matsa (2013) in two important respects. First, they use risk-adjusted (i.e., "risk-neutral") probabilities of bankruptcy, based on a binomial model as in Almeida and Philippon (2007), in which they adjust the risk-neutral probabilities inferred from bond prices by estimating the ratios in the certainty equivalents of uncertain losses of workers and bondholders. Second, they not only include the losses from unemployment but also the wage losses of those who continue to be employed with the insolvent firm. These methodological differences result

in somewhat higher estimates of the labor-related costs of financial distress: 304 (518) basis points for a BBB (BB) rated firm (see column 4 of Table 1). In summary, the contributions to the second method provide consistent evidence for a significant cost of financial distress from incorporating the costs for employees.

Human-capital-intensive firms have more conservative financial policies.

The third implication of the extended trade-off theory of capital structure is that human-capital reliant firms should have more conservative financial policies. This cross-sectional prediction has been analyzed in several studies. The literature on the baseline version of the trade-off theory has noted the sizeable gap between the apparent tax benefits of debt and estimates of the costs of financial distress (Graham, 2000), such that firms' financial policies appear to be excessively conservative, the "debt conservatism puzzle." This puzzle can be resolved only partially by using risk-adjusted probabilities (Almeida and Philippon, 2007, see Table 1, columns 5 and 6). Agrawal and Matsa (2013) and Graham, Kim, Li, et al. (2023) both conclude from the magnitudes of their estimates reported above that accounting for the wage premium for financial risk can help resolve this puzzle.

Bae, Kang, and Wang (2011) use KLD (now MSCI) data on the ratings that employees award to their employers for five categories of employee-relevant issues (e.g., union relations, employee involvement) and construct an index of employee friendliness. They find that this index is negatively related to leverage and corroborate this finding by showing that firms listed in the *100 Best Companies to Work For* ranking of *Fortune* magazine have lower leverage than their matching controls. The authors argue that such measures of employee friendliness should be higher for firms that rely more on implicit contracts with their workforce and rule out competing explanations for their main findings by including controls for measures of growth opportunities and agency costs.

Firms' reliance on human capital can also be measured by the extent to which they employ workers with scarce skills. In their study of highly-skilled Swedish employees, Baghai, Silva, Thell, et al. (2021) show that firms have more conservative financial policies if they rely more on talented workers. Moon and Phillips (2017) analyze firms that rely more on contracts with other firms (outsourcing through outside purchase contracts) and show that these firms have lower operational and financial risk and use more private debt. Moreover, firms that outsource more reduce their leverage if they also employ higher value-added employees – another measure of reliance on human capital – whereas there is no such effect for firms that do not outsource as much. Their findings suggest that firms reduce the risks from severing implicit contracts with suppliers and employees through lower leverage. Kuzmina (2023) shows that firms have lower leverage if they hire workers on less flexible contracts. Using labor-market programs that affect firms' hiring decisions as a source of exogenous variation, her counterfactual

analysis shows that firms would reduce their leverage ratio by four percentage points if they were completely prohibited from hiring workers on flexible contracts.

The human capital costs of employees increase if they have fewer outside options. One determinant of these outside options is the size of the local labor market: if employees find a new job more easily in a larger local labor market, then their human capital risk from losing their existing job is reduced. H. Kim (2020) exploits exogenous variations in the size of local labor markets from plant openings, which change the size of the typical local labor market by more than 20%. He finds that these positive shocks to local labor market size predict increases in the leverage of incumbent firms in these markets, consistent with the notion that the human capital costs of the employees of the incumbent firms decline when their labor markets expand. Graham, Kim, Li, et al. (2023) and Dore and Zarutskie (2022) both show that this premium is lower in larger local labor markets. Bai, Massa, Wan, et al. (2022) construct a measure of local labor market concentration from data from online job postings and show that firms competing in more concentrated labor markets have higher leverage, which supports the hypothesis that these firms have more bargaining power and thus pay lower risk premiums to employees. Similarly, the generosity of unemployment insurance affects employees' outside options and the value of their human capital. Agrawal and Matsa (2013) argue that more generous unemployment insurance by the state reduces employees' human capital risks and thereby the wage premium demanded by employees. They exploit cross-sectional variation in state unemployment insurance and show that higher unemployment insurance is associated with higher leverage.

Finally, Öztekin (2024) extends the research on the relationship between human capital costs and capital structure by introducing health risk as a moderating variable. She cites earlier findings that negative shocks to health are among the most prominent determinants of human capital costs, and that employees become more averse to the risks of their human capital if they experience a sudden deterioration in their health. Her study uses data on mortality and the incidence of infectious diseases in the states of firms' headquarters and shows that several indicators of increased health risk are consistently and negatively related to leverage. Under her interpretation, increases in employees' aversion to human capital risk led firms to reduce their leverage.

Overall, we can conclude that firms that rely more strongly on human capital have lower leverage. Combined with the earlier findings for the human costs of financial distress and the risk premium in wages, there is significant support for the extended trade-off theory of capital structure and its implications for leverage.

3.3 Financial constraints

The previous section assumes that firms have access to funding and can freely choose their capital structure to balance the objectives of investors and employees. In this section, we ask what happens if firms are financially constrained. Theoretical arguments in the literature have identified several mechanisms through which financial constraints affect firms' workforce: (1) since human capital and intangible assets provide little or no collateral value, access to credit and collateralized lending affects the level of employment; (2) financially-constrained firms avoid operating leverage and value the flexibility associated with employing temporary workers (Caggese and Cuñat, 2008); thus, financial constraints also affect the composition of employment; (3) financially-constrained firms assign a higher marginal value to internal funds and try to conserve short-term cash flows through their choice of compensation, employment, and investment policies (e.g., Eisfeldt and Rampini, 2007; Gamba and Triantis, 2008, Michelacci and Quadrini, 2009; Bolton, Wang, and Yang, 2019).

Firms' financial constraints impair employees' human capital.

There is a second channel through which human capital affects the capital structure of firms, which is related to but distinct from the channel through the costs of financial distress discussed in the previous section. This argument recognizes that firms cannot collateralize human capital, which is inalienable, and entrepreneurs or employees cannot commit to not withdrawing their human capital from the firm (Hart and Moore, 1994; Bolton, Wang, and Yang, 2019). To the extent that informational and other frictions require firms to collateralize their debt, human-capital-intensive firms can only borrow if they have other assets that can serve as collateral (Kiyotaki and Moore, 1997; Rampini and Viswanathan, 2013). The lack of collateralizability creates financial constraints and has several implications for firms' capital structure and investment policies. First, it may force firms to cut employment as their investment and employment decisions are constrained by the availability of funds. Second, they may rely more on equity than on debt and hold more cash, since liquid assets enable firms to exploit future growth opportunities (see the model of Falato, Kadyrzhanova, Sim, et al., 2022). Third, and finally, firms may borrow against future cash flows rather than assets, which exposes their debt capacity to the risk of future access to human capital and creates an interdependence between financial constraints and firms' ability to match capital with labor (Choi and Cook, 2024).

We begin by discussing the impact of financial constraints on the level of employment. Adelino, Schoar, and Severino (2015) use county-level data to show that the collateral-lending channel explains 15-25% of the variation in employment for small businesses in their sample. Small businesses are credit-constrained and have to borrow against collateralizable assets. Hence, they raise employment and investment if house prices and, therefore, the value of their collateral increases. The authors note that the supply-side effect may be confounded by demand effects if the same factors that influence real

estate prices also affect the demand for firms' output. To address this issue, they show that the credit-supply effect on employment also holds in subsamples of firms in tradeable industries, for which demand should be unaffected by factors that drive the variation in local real estate prices. Ersahin and Irani (2018) confirm these findings using firm-level data on employment and estimates of the market values of firms' real estate holdings. They estimate that a $1 increase in the value of real estate collateral leads to an increase in employment expenditures of $0.10.

Based on the premise that access to finance is critical for employment decisions, several studies have explored how firms react to sudden changes in their ability to raise funds, and many of these studies focus on the Great Financial Crisis. The first published study in this literature may be Chodorow-Reich (2014), who analyzes a sample of 2,000 non-financial firms and identifies those that had borrowed more from financially less healthy banks. He shows that these were more likely to experience a decline or even a complete loss of access to credit compared to other firms that had borrowed from healthier banks. This contraction in credit translated into an economically significant decline in employment for these firms. Moreover, the negative effect is concentrated entirely in small and medium-sized firms with fewer than 1,000 employees, indicating that smaller firms were often unsuccessful in locating other sources of finance. These findings receive support from Duygan-Bump, Levkov, and Montoriol-Garriga (2015), who show that workers of small firms were more likely to become unemployed during the Great Financial Crisis, and this effect is more pronounced for firms in industries that are more dependent on external finance. In addition, they report the same findings for the Savings and Loan (S&L) crisis in 1990-1991, which was associated with a reduction in loan supply but not for the 2001 recession, which did not originate in the banking sector and was not associated with a decline in loan supply.

Milanez (2012) studies mass layoffs in California during the Great Financial Crisis and adopts the strategy of Almeida, Campello, Laranjeira, et al. (2012), who identify financial constraints from the long-term debt of a firm that matures in a particular year. Her study finds a five-percentage-point stronger decline in employment growth for financially-constrained firms compared to unconstrained firms. She further investigates and rejects the hypothesis that constrained firms lay off low-paid workers more than highly-paid workers based on the assumption that highly-paid workers are more valuable to firms and, therefore, more likely to be retained. Caggese and Cuñat (2008) formally derive this hypothesis in their model and also conclude that this effect is outweighed by the opposing effect that financially-constrained firms demand more flexibility. Finally, Giroud and Mueller (2017) find larger employment losses for more highly-levered firms, which supports the other studies on the Great Financial Crisis based on the plausible assumption that highly-levered firms have exhausted their debt capacity and are more likely to be financially constrained.

Benmelech, Frydman, and Papanikolaou (2019) use newly hand-collected data on the employment of large firms during the Great Depression, and also adopt the maturing-debt strategy of Almeida, Campello, Laranjeira, et al. (2012) to identify financial constraints. They show that firms in areas where local banks failed reduced employment by 11% to 17% more compared to firms in areas without bank failures but with similar levels of maturing bonds. Unique in this literature, their study documents effects for larger firms. Benmelech, Bergman, and Seru (2021) use three different strategies and data sets to isolate the impact of financial constraints on employment from confounding effects: (1) the Almeida et al. maturing-debt strategy; (2) the relaxation of financial constraints after deregulating intra-state and inter-state branching restrictions in the US, which improved credit supply; (3) the contraction of credit supply by Japanese banks in the US, triggered by a collapse of real estate prices in Japan (Peek and Rosengren, 2000). They document economically significant declines in employment for all three identification strategies.

Table 2: Financial constraints and employment. The table summarizes studies on the impact of financial constraints on employment. The column "Financial constraints" shows how these studies measure or instrument for financial constraints. The column "Shock" shows how studies incorporate time-series variation, either by macro-level shocks such as recessions, firm-level shocks (e.g., the amount of maturing debt), or regional shocks (e.g., changes in state-level banking regulation). The column "Results" indicates whether the results of the respective study support the hypothesis that tighter financial constraints reduce employment ("positive") or whether they do not find evidence ("null").

Study	**Financial constraints**	**Shock**	**Result**
Chodorow-Reich (2014)	Reliance on less healthy banks	Great Financial Crisis	positive
Duygan-Bump, Levkov, and Montoriol-Garriga (2015)	External financial dependence External financial dependence External financial dependence	Great Financial Crisis S&L crisis Recession of 2001	positive positive null
Benmelech, Frydman, and Papanikolaou (2019)	Maturing debt	Great Depression	positive
Milanez (2012)	Maturing debt	Great Financial Crisis	positive
Giroud and Mueller (2017)	High leverage	Great Financial Crisis	positive
Benmelech, Bergman, and Seru (2021)	Maturing debt Deregulation of banking Borrow from Japanese banks	Maturing debt Deregulation of banking Collapse in Japanese real estate	positive positive positive
Barrot, Martin, Sauvagnat, et al. (2024)	Government loan guarantee	Great Financial Crisis	positive

Table 2 summarizes the seven studies on financial constraints and employment, which together report the results of eleven separate empirical investigations spanning the period from the Great Depression to the Great Financial Crisis. The overall result is conclusive: Tighter financial constraints have an

economically and statistically significant impact on employment. The only investigation that does not find a significant effect is the analysis of the recession of 2001 in Duygan-Bump, Levkov, and Montoriol-Garriga (2015), which may be regarded as a placebo test since it was not associated with a reduction in credit. Moreover, all studies that specifically addressed firm size, except Benmelech, Frydman, and Papanikolaou (2019), find that the impact of declining credit supply falls entirely or mostly on small firms. Complementing this literature based on regression models, Schoefer (2021) develops and calibrates a labor search and matching model. He considers scenarios with and without financial constraints, and scenarios with and without rigid wages. His main finding is that neither wage rigidity nor financial constraints alone, but only their interaction can account for much of the observable labor market fluctuations. Hence, wage rigidity leads to employment fluctuations only in the presence of financial constraints, since firms then respond to cash-flow squeezes with reduced hiring.

Giroud and Mueller (2015) study a somewhat different setting in which employees of the plants of multi-location firms are negatively affected by positive shocks to investment opportunities at other plants of the same firm if the firm is financially constrained. The underlying mechanism is that for financially-constrained firms, the opportunity costs for investing in a focal plant increase if the investment opportunities of other plants in the same firm improve (e.g., Stein, 1997). Consistent with this notion, they show that a positive shock to one plant increases employment by about as much as it declines at other plants as financially-constrained firms reallocate resources within the firm.

While the effects of financial constraints and leverage on employees in all studies are unequivocally negative, the effects on overall welfare can still be positive because bankruptcies can facilitate the elimination of inefficient firms in a process of creative destruction. Almazan, de Motta, and Titman (2015) theoretically analyze this mechanism and show that its economic costs may outweigh the benefits in recessions and that monetary and fiscal policies may help firms to make optimal financing and liquidation choices. Barrot, Martin, Sauvagnat, et al. (2024) investigate this trade-off empirically by studying the employment effects of a loan-guarantee program in France that targeted SMEs during the Great Financial Crisis, exploiting regional variation in treatment intensity as an identification strategy. They find positive employment effects but also the potentially detrimental reallocation effect that keeps workers employed in less productive firms. They estimate that the overall impact on the government's budget was positive, as the costs from defaults on guaranteed loans were more than compensated for by lower expenses on unemployment benefits.

An emerging literature addresses the impact of financial constraints on employees beyond mere measures of income and employment. Hu, Levine, Lin, et al. (2022) use the deregulation of banking (restrictions on interstate branching) as a measure of financial constraints and relate it to an index of

mental health, particularly depression, constructed from individual-level survey data, and find that the incidence of depression declines substantially if access to credit improves. They attribute their findings to the firm channel: deregulation increases firms' access to credit and thereby income and employment, which improves mental health; they find no evidence for the consumer channel (better access to consumer loans). Kárpáti and Renneboog (2023) report similar findings for the Netherlands. They study data on the use of antidepressants and use the Almeida et al. maturing-debt instrument to identify financial frictions. In their sample, employees of firms with at least 25% of debt maturing in 2008 experienced a 0.44 percentage point higher likelihood of antidepressant use, compared to a baseline probability of 5%.

Overall, the findings reported in this section provide conclusive evidence that financial constraints are costly for firms directly. They reduce operational flexibility, as well as indirectly, because they impair employees' human capital. The remainder of this section analyzes the different strategies firms employ to manage and mitigate the impact of financial constraints and how these strategies affect employees.

Strategy 1: Conserve short-term cash flows

Firms put a higher value on internal cash flows in those states of the world in which they are financially constrained (e.g., Eisfeldt and Rampini, 2007; Michelacci and Quadrini, 2009). This section discusses three ways in which firms can conserve short-term cash flows, and which affect employees: they can defer wage payments (implicit contracts), award equity-based pay (explicit contracts), and reduce investments in employees' well-being.

Firms can conserve cash by deferring wage payments

To analyze the first of these options, Michelacci and Quadrini (2009) develop a dynamic model in which firms agree on long-term contracts with workers, building on the model of Harris and Holmstrom (1982) discussed in Section 3.1. Because the enforceability of these contracts is limited, firms are financially constrained, and the resulting contracts involve firms paying lower wages when they are constrained and then increasing wages when they become unconstrained. Hence, workers effectively become lenders to their firms. The model predicts that faster-growing and financially constrained firms ("firms under financial pressure") pay lower wages, and they find support for their predictions in samples of US data and Finnish data. Guiso, Pistaferri, and Schivardi (2013) corroborate these findings in their study of internal credit markets in Italian firms by showing that firms in financially less-developed Italian provinces offer lower pay but faster wage growth to new hires, consistent with the notion that firms substitute borrowing from employees for borrowing from banks. The results of Howell and Brown (2022) support the predictions of dynamic wage models for firms with financial constraints. They show that firms partially use cash windfalls from government R&D grants to increase employee compensation, on average by 2.9%. The authors rule out explanations based on firm growth

or productivity increases and argue that the best explanation for their findings is that firms honor their implicit contracts with workers who receive wages as firms become less financially constrained.

Garmaise (2008) develops a related but different idea of how employees contribute to overcoming financial constraints in a model in which firm quality is unknown, but workers acquire more information about firm quality than the suppliers of physical capital. Therefore, workers do not require advanced cash payment from firms, whereas suppliers of physical capital do, and financially constrained firms rely more on labor than on capital as an input for production. He supports the predictions of his model on the capital-to-labor ratios of financially constrained and unconstrained firms with an empirical analysis of US data.

Firms can conserve cash by awarding equity-based pay

An alternative to implicit contracts, in which firms borrow from workers by promising them deferred wage payments, is the award of stock and stock options, which provide employees with contractual claims by turning them into equity investors. The role of employees as investors who help finance the buyouts of their firms has already been recognized by Chaplinsky, Niehaus, and Van de Gucht (1998). Sun and Xiaolan (2019) use the granted but not yet exercised portion of stock-based compensation as a measure of employee financing of the firm and find that it is strongly related to investments in intangible assets but not to investments in tangible assets. These observations are explained by their model, in which employees can enforce their claims against the firm by threatening to leave and depriving the firm of a critical input, whereas creditors lack a credible liquidation threat against firms that have no collateral. Hence, in a reversal of roles, employees who lend to the firm regard intangible assets, but not tangible assets, as effective collateral, resulting in an impact of investments in intangible capital on deferred equity-based compensation.

This connection between the trend toward intangibles noted above and deferred compensation may explain the trend toward more equity-based compensation of skilled non-executive employees reported by Eisfeldt, Falato, and Xiaolan (2023) (see Section 2.2.3). They report that equity-based pay has increased by a factor of almost 30 from the 1980s (average: $4.1 bn) to the 2010s (average: $116.1 bn), and its share of value added increased sixfold from 1% to 6% over the same period (see their Table 1B). Eisfeldt, Falato, Lee, et al. (2023) relate equity-based pay to non-executive employees to deferred compensation, which helps firms relieve financial constraints, and to regular share repurchases. Firms that award stock options to employees may prefer repurchases for the same reasons that have been found for executive stock options: these options are not dividend protected (Lambert, Lanen, and Larcker, 1989; Fenn and Liang, 2001) and they dilute earnings per share when exercised (Bens, Nagar, Skinner, et al., 2003); repurchases avoid the first issue and counteract dilution. Note that equity-based

compensation serves additional purposes; specifically, it provides incentives and helps firms retain critical employees (see Section 3.4 below).[9]

Firms can conserve cash by reducing investments in employees

The third way in which firms can conserve short-term cash flows is a reduction in investments that serve employees' well-being. Two recent studies show that financially constrained firms invest less in employees' well-being. Cohn and Wardlaw (2016) show robust evidence for a negative relationship between several measures of financial constraints (leverage, internal cash flow, cash balances) and establishment-level indicators of injury rates. Evaluating three natural experiments suggests that this relationship is causal and economically significant: for example, a one-standard-deviation increase in a firm's cash flow reduces injury rates by about 10%. Similarly, Marciukaityte (2024) shows that unionized firms have higher workplace injury rates, and that this effect is more pronounced during the Great Financial Crisis for firms with higher leverage, suggesting that firms compromise on workplace safety when financial constraints become more binding. Relatedly, Bai, Lee, and Zhang (2020) show that capital market pressure (exemption from short-selling constraints under SEC regulation SHO) leads to a significant increase in workplace injury rates. Overall, allocating funds to improving workplace safety is likely a long-term investment that can be cut if access to funding is reduced. This interpretation is also consistent with Cohn, Nestoriak, and Wardlaw (2021), who provide evidence for a negative relationship between workplace safety and "short-termism."

Caggese, Cuñat, and Metzger (2019) analyze how the need to conserve short-term cash flows affects the composition of the workforce and, more specifically, the selection of workers affected by layoffs for a sample of Swedish firms. Based on their theoretical model, the authors hypothesize that unconstrained firms generally prefer to retain high-value-added, short-tenured workers and lay off longer-tenured workers. However, financial constraints should distort firing decisions toward shorter-tenured workers with lower entitlements to severance pay and thus a lower impact on short-term cash flows. Using shocks to the exchange rate to identify exogenous variation in the likelihood of firing and credit ratings to measure financial constraints, they show that an increase in financial constraints leads to an economically large increase in the likelihood of firing short-tenured workers.

Hence, the findings in the literature show that firms employ different strategies to conserve short-term cash flows to mitigate the impact of financial constraints, which affect the compensation and structure of the workforce as well as workplace safety. Most importantly, employees of human-capital-intensive firms tend to become investors in their firms, either as creditors, when they enter implicit

[9] Lazear (2004) argues that deferred compensation can also serve as a screening tool, especially in start-ups and small firms.

contracts that provide for deferred wage payments, or as shareholders, when firms award them equity-based pay. Frictions (informational, enforceability of contracts) can make employees more suitable than external investors to finance intangible capital.

Strategy 2: Hold more cash

A second strategy for managing financial constraints is to accumulate precautionary cash holdings and save cash for a "rainy day." Empirically, about 10% of US firms have no debt, and about one-third have zero or negative net debt in the sample of Strebulaev and Yang (2013) (see Section 2.2.1). These fractions have increased steadily over four decades. Yet, without considering the joint impact of financial constraints and the wage premium for financial risk, it is difficult to rationalize these observations. In particular, the extended trade-off theory can only make predictions for net debt. However, Acharya, Almeida, and Campello (2007) observe that cash is not equivalent to negative debt in financially constrained firms because only cash holdings provide immediate liquidity, so these firms prefer higher cash holdings to lower gross debt levels (see also Demiroglu and James, 2011). Döttling and Perotti (2020) and Döttling, Ladika, and Perotti (2025) present theoretical models that predict large cash holdings for human-capital-intensive firms. In these models, firms pay employees more in the form of deferred compensation, which increases their human capital risk. Employees then become creditors to the firm, and cash holdings serve as additional collateral that protects their claims.

Consistent with theoretical predictions, Ghaly, Dang, and Stathopoulos (2015) show that an increase in employee welfare is associated with higher cash holdings. Moreover, this effect is stronger for firms in industries that rely more on human capital, consistent with the notion that firms hold more cash to attract and retain employees. In a later paper (Ghaly, Dang, and Stathopoulos, 2017), the same authors investigate the relationship between cash holdings and firms' reliance on human capital more directly by developing an industry-level measure of the extent to which firms employ skilled workers, which they measure by constructing an industry-level "labor skill index" from data on the skills (education, working experience, and training) employees require for their jobs. They find that a one-standard-deviation increase in this index leads to a more than 20% increase in the cash ratio relative to its sample mean. Finally, Liu (2025) proxies for human capital reliance by distinguishing industries based on their use of robots, which can potentially substitute for human capital and reduce firms' reliance on human capital. Using instrumental variable regressions, she shows that robot usage leads to higher financial leverage and lower cash holdings, consistent with theoretical predictions of how human-capital reliance affects financially-constrained firms. Overall, we can conclude that human-capital-intensive firms hold more cash and that reduced gross leverage is only a partial substitute for higher cash holdings.

Strategy 3: Increase operating and financial flexibility

A range of factors, including long-term contracts, matching frictions in the labor market, and adjustment costs involved in changing the amount of labor input, imply that labor is mostly a fixed factor of production, which is difficult to adjust in the short term (Oi, 1962). Since financially-constrained firms are more vulnerable to liquidity shocks, they display a "demand for flexibility" (Caggese and Cuñat, 2008): The commitment to long-term employment relationships creates operating leverage, which is more costly for them and creates additional demand for temporary workers compared to unconstrained firms. This hypothesis was already investigated by Hanka (1998) for US data going back to the 1950s. He finds that higher-levered firms reduce employment more frequently and use more part-time and seasonal workers. More recently, Campello, Kankanhalli, and Muthukrishnan (2024) analyze job postings and how firms' hiring decisions changed in 2020 at the beginning of the COVID-19 crisis, which significantly exacerbated financial constraints. They find that firms dramatically reduced job postings and that this cut was larger for postings of high-skilled jobs ("downskilling"), consistent with the notion that high-skilled hirings require longer-term and less reversible commitments. Moreover, they create an index for the flexibility of jobs using textual analysis of the job postings and report a significant increase in postings asking that employees be more flexible in tasks and schedules, likely attributable to the higher uncertainty of the economic and work environment; these effects are magnified for financially-constrained firms. Relatedly, Barry, Campello, Graham, et al. (2022) evaluate surveys from CFOs and find that firms with more financial flexibility planned to grow employment and capital expenditure more during the COVID-19 crisis. Acabbi, Panetti, and Sforza (2019) show a similar effect by documenting that the credit freeze in Portugal in the wake of the Great Financial Crisis significantly reduced employment between 2008 and 2013, and that the bulk of this effect falls on firms with larger and less flexible commitments to their workforce.

Dou, Ji, Reibstein, et al. (2021) formulate and test a model in which the key variable that distinguishes firms is the degree to which the brand loyalty of a firm's customers ("customer capital") depends on key employees in a firm (managers, innovators, designers) whose human capital is critical for maintaining customer capital. Since the commitment to retaining these critical employees reduces firms' flexibility and increases their operating leverage, firms with a higher dependence of their customer capital on key employees are more exposed to financial constraints. As the model predicts, firms with a stronger dependence of their customer capital on key employees experience a higher turnover of these employees, and this effect is exacerbated by financial constraints. The economic magnitude of these effects is significant, and the model attributes them to firms' need to reduce operating leverage and thus their commitments to key employees if they are financially constrained.

Firms can address financial constraints more directly by changing their production toward a stronger reliance on collateralizable physical assets relative to labor (Calvo, Coricelli, and Ottonello, 2025; Jermann and Quadrini, 2012). ElFayoumi (2020) shows that firms managed financial constraints after the Great Financial Crisis by adjusting their production as well as their financing strategies. In his sample of European firms, the median firm increased the capital-to-labor ratio in 2008 by 13%, thus substituting labor for capital and thereby increasing the proportion of its expenditures that create collateralizable assets. Moreover, the median firm also extended the maturity of its debt by about 9%, thereby reducing its reliance on short-term debt. Relatedly, in their analysis of deferred equity compensation (see above), Sun and Xiaolan (2019) also find that claims to deferred compensation to employees create an overhang, similar to a debt overhang (Myers, 1977), which reduces firms' debt capacity and borrowings. Hence, we can observe from this literature that firms mitigate the impact of costly financial constraints by reducing operating leverage through downskilling, even if this implies losing critical employees; increasing collateralizable assets through increasing the capital-to-labor ratio; and, finally, reducing leverage.

Summary: The impact of financial constraints

Human-capital-intensive firms lack collateral, which creates and exacerbates financial constraints. Conversely, financial constraints create additional costs for making long-term commitments to workers. The literature has isolated four different channels through which financial constraints affect employees, but these channels have received varying degrees of attention: (1) Financially-constrained firms scale back their operations. The scale effect applies mostly to small firms and financially-constrained firms that rely on collateralized bank lending, and is by now well understood and supported by many studies on recessions. (2) There is only one study that shows that firms change their technology and increase their capital-to-labor ratio. This channel has received surprisingly little attention, as most studies focus on one outcome variable (e.g., only capital expenditure, only employment) and do not study how shocks and financial constraints affect the proportions of labor and capital, and potentially other dimensions of technology. Clearly, more research is needed here. (3) Firms sacrifice long-term profit opportunities to conserve internal funds by reducing long-term investments in employee well-being and their reliance on high-skilled workers through downskilling. (4) Firms switch their financing sources from external debt, which requires tangible capital as collateral, to either internal equity (stock-based compensation) or internal debt (deferred pay), both of which create claims to employees that are secured by intangible assets.

3.4 Capital structure and labor mobility

Since human capital is inalienable, employees have only a limited ability to commit to long-term relationships with their firms (Hart and Moore, 1994; Bolton, Wang, and Yang, 2019). Employees'

limited ability to enter enforceable contracts is costly for firms, just as firms' limited ability to commit to long-term contracts is costly for employees. Voluntary turnover has increased dramatically in recent years and has been labeled as the "Great Resignation" by some commentators (Breitling, Dhar, Ebeling, et al., 2021; Hoffmann and Vladimirov, 2025). Hence, in this section, I first discuss the costs of labor mobility to firms and its implications for capital structure. Then, I review the work on how firms can retain employees through the award and appropriate design of equity-based pay awards. Finally, I discuss the argument that, while restricting labor mobility is attractive to firms that depend on critical employees, it may still have negative welfare consequences by imposing costs on employees and imposing negative externalities on other firms.

Losing employees is costly for firms.

Sanati (2025) theoretically analyzes and structurally estimates the impact of labor mobility on firms' financing and investment policies. His model is dynamic and combines heterogeneous skills, labor mobility (outside job offers), labor adjustment costs, and wage setting through bargaining between firms and workers. He finds that human-capital reliant firms become less profitable and grow less if their workers are more likely to leave. A hypothetical doubling of the availability of outside job offers, the model parameter that reflects labor mobility, leads to about 10% lower investment and hiring rates for firms with high-skilled employees. Moreover, these firms reduce their leverage by about 35%. Chen, Li, Thakor, et al. (2024) perform a closely-related exercise and structurally estimate a dynamic investment model in which labor mobility has costs and benefits to firms. On the one hand, firms' investments in intangible capital are partially appropriated by employees, whose human capital is enhanced by the firm's investments. This effect gives rise to knowledge spillovers and prevents firms from fully capturing the return on their investments. On the other hand, the same effect also creates effort incentives for employees, who benefit from additional contributions to intangible assets through the increased value of their outside options. The second incentive effect is novel to this model. The calibrations show a hump-shaped relationship between labor mobility and firm value: Excessively high restrictions on labor mobility may reduce firm value by reducing employees' incentives, and firms may benefit from permitting a certain amount of knowledge spillovers.

The empirical challenge in analyzing the impact of labor mobility on firms is that most databases do not identify which employees are laid off and which leave voluntarily. Several papers identify sources of exogenous variation in labor mobility to address this issue. Jäger, Heining, and Lazarus (2022) study the deaths of 34,000 workers of German firms and analyze how firms' wage setting and hiring policies change after the death of one employee. They show that firms pay higher wages to the incumbent employees who work in the same occupation as the deceased, resulting in a higher probability of

continuing to work for the same firm.[10] The positive wage effect is also amplified if the deceased worker is more highly specialized, indicating higher losses associated with the loss of employees who are harder to replace. Firms hire new workers to replace deceased workers but at a rate of less than one-for-one and with a delay, resulting in a drop in total employment. Moreover, new hires earn higher wages if they replace deceased workers. Paul (2022) investigates the consequences of the Trump administration's 2017 "Buy American Hire American" executive order, which dramatically reduced the access of Indian multinational firms to IT workers in their US branches. They show that these firms absorbed the effect by downsizing their US operations, which involved reducing their recruiting and training of employees. In the process, the productivity of the affected firms increased, whereas their profit growth declined.

Babina and Howell (2024) explore a different cost of labor mobility by showing that firms lose knowledge capital when losing employees. They find that higher R&D expenses are followed by increased departures of employees, who then join the founding teams of start-ups, apparently taking some of the ideas and innovations of their former employer with them to the new firm. (See Section 4.2 for a more detailed discussion of this paper.)[11] Kundu and Mueller (2024) explore a similar idea and identify employees of technology firms who simultaneously act as angel investors in start-ups, thereby using some of their work capacity and technological knowledge in addition to personal funds to support young firms. They show that employers' innovation output decreases when employees personally invest in start-ups and suggest that these employees divert time and effort to their investments.

Chen, Zhang, and Zhang (2025) provide evidence that more intense competition for skilled workers reduces firm growth. They construct a measure of the competition for talent in local labor markets and show that moving from the lowest to the top tercile of this measure leads to a reduction of firms' investment of 22%. Moreover, the negative effect is concentrated in small and medium-sized firms, whereas large firms are more resilient and less likely to lose skilled employees, which the authors relate to increases in industry concentration. All these recent papers suggest that losing the services of skilled employees is costly for firms. Section 5.2 (especially the part "Labor mobility") discusses some complementary studies that relate labor mobility to firm value and asks whether the risk of labor mobility is priced in financial markets.

[10] The effect obtains irrespective of the fact that workers seem to systematically underestimate their outside options (Jäger, Roth, Roussille, et al., 2024).

[11] This effect was already observed in Rajan and Zingales (2001) for several anecdotes. They interpret these observations as "idea stealing" by employees to build a theory of organizations based on the notion that firms need to protect their knowledge capital by restricting employees' access to their core ideas.

Babina (2019) investigates whether employees leave firms in financial distress to found or join start-up firms. Using US census data from 1990 to 2008, she shows that industry-wide shocks lead to an about 20% higher increase in departures to entrepreneurship. Consistent with the notion that employees leave because their current employers face binding financial constraints, which prevent them from implementing growth options, she finds that the new employers grow employment at a higher rate compared to other new firms. Hence, while financial constraints prevent firms from exercising growth options, there is a potentially understudied compensating effect: when employees leave the firm, they may take the growth options with them, which mitigates the employment losses and welfare consequences of financial constraints and provides a bright side to labor mobility.

The overall picture is that labor mobility is costly for firms. Firms respond to losing the services of their employees with higher wages, lower growth, or outright downsizing, and lower innovation. However, there is a countervailing incentive effect if the option to leave encourages employees to invest more in their outside option, which temporarily benefits their current employers and may render the relationship between labor mobility and firm value non-monotonic.

Firms use many tools to retain their employees

Given that the loss of employees, especially highly-skilled employees, is disruptive, it is unsurprising that firms have developed multiple strategies to reduce the turnover of their labor force.

Deferred compensation

Several recent working papers analyze theoretically how deferred compensation and equity-based pay awards can be used to retain non-executive employees and prevent them from joining other firms (Oyer and Schaefer, 2005; Döttling and Perotti, 2020; Döttling, Ladika, and Perotti, 2025; Anderson, 2023; Hoffmann and Vladimirov, 2025). The key idea in all these papers is that workers are awarded deferred pay and forfeit a portion of their compensation if they leave the firm. This idea has already been used by Oyer (2004) in the literature on CEO compensation, who also shows that equity awards are more efficient for retention than deferred fixed pay because they avoid overcompensating employees in bad states of the world. Hence, in addition to conserving firms' short-term cash flows (see Section 3.3), deferred compensation helps firms retain employees. Going beyond executives, Aldatmaz, Ouimet, and Van Wesep (2018) analyze the connection between stock options and turnover by analyzing broad-based stock-option plans. While they find the hypothesized reduction in turnover to be economically and statistically significant, they show that it is only temporary: Employees simply delay their decisions to leave the firm. Chen (2024) analyzes a related model in which workers compete with each other. Then, equity-based provides insurance against promotion risk, as workers benefit from other workers raising firm value, which makes staying with the firm attractive.

Hoffmann and Vladimirov (2025) add to this literature by analyzing "worker runs," the clustering of employee turnover in firms, so that firms lose many employees at the same time. They cite a large body of empirical literature documenting this phenomenon. In their model, incumbent employees update beliefs about their own outside options when they see the resignations of their colleagues, triggering further job search and resignations. Then, equity-based pay dominates deferred fixed compensation if the equity awards vest over time: Employees who resign lose their non-vested claims and thereby do not dilute the equity awards of the remaining employees, whose value of staying with the firm automatically increases. While these and several other papers connect equity-based compensation and delayed vesting to the motive to retain employees, the empirical implications of these models remain largely untested. Sections 2.2 and 3.3 already establish the general finding that human-capital-intensive firms use more equity-based pay in our discussion of financial constraints above, and it is plausible that deferred compensation simultaneously serves the purpose of conserving cash flows and of retaining employees. Gopalan, Huang, and Maharjan (2021) test these implications for executives and show that deferred vesting is an effective strategy for reducing voluntary CEO turnover. However, the extent to which the trend toward more equity-based pay to non-executive employees (Eisfeldt, Falato, and Xiaolan, 2023; see Section 2.2.3), and vesting provisions more specifically, serve the purpose of retaining employees, or whether these compensation strategies are better explained by other forces (managing financial constraints: Eisfeldt, Falato, Lee, et al. (2023); screening employees: Lazear, 2004; providing incentives: Babenko (2009); Chen, 2025) is still an open question that should be addressed in future research.

Contractual restrictions: Non-compete agreements

The insight of Section 3.2 – leverage is costly for employees – implies that retaining employees becomes harder for firms with higher leverage. Combining this argument with the observation above that losing employees is costly implies that firms with lower costs of losing employees can afford to have higher leverage. Several studies test this implication using variation in the enforceability of non-compete agreements, which prevent employees from accepting employment at competitor firms and thus reduce employee mobility (Marx, Strumsky, and Fleming, 2009). In the US, states that recognize the Inevitable Disclosure Doctrine (IDD) enforce employment contracts that prevent employees from working for competitors because such employment may "inevitably" lead to the disclosure of trade secrets. Klasa, Ortiz-Molina, Serfling, et al. (2018) use the staggered introduction of IDD enforcement over the 1977–2011 period and show that firms indeed increase leverage by 19% (book leverage), respectively, 15% (market leverage) in locations in which the IDD applies and reduces labor mobility.

Jeffers (2024) finds that increasing the enforceability of non-compete agreements reduces departures of employees in knowledge-intensive occupations by 7% to 11% and increases capital expenditure,

consistent with the hypothesis that the retained employees have skills that are complementary to physical capital. However, this strengthening of incumbent firms leads to lower entry in the affected sectors. Similarly, Lu and Peng (2022) investigate the increase in enforceability of non-compete agreements and find that more enforceable agreements reduce firms' idiosyncratic volatility and the sensitivity of their investments to Tobin's Q. (The last result is also reported by Sanati, 2025, see the discussion of his paper above.) Both findings are consistent with a larger role of human capital in firms that can rely on non-compete agreements, since prior literature has associated both outcomes, lower investment-Q sensitivity and less risk-taking, with a larger dependence on human capital and intangible capital. Chowdhury and Doukas (2022) analyze the implications of labor mobility for cash holdings and the marginal value of cash on the balance sheet. They find that firms in states that adopt the IDD and thereby reduce labor mobility increase their cash holdings and experience an increase in the marginal value of cash. Hence, their results support the conclusion that IDD adoption leads to a longer-term commitment to employees and that these long-term commitments require firms to provide additional security through cash holdings. In summary, the findings on regulatory restrictions on labor mobility all show that this regulation is effective in reducing employee turnover and support the predictions of models that associate reductions in labor mobility with a stronger reliance on human capital, a shift from investments in physical capital to investments in intangibles, and, associated with that, lower leverage, and higher cash holdings.

Other tools

In addition to compensation and contractual restrictions, young firms also consider labor mobility in the decision to go public and delay IPOs, which reduces the liquidity of employees' stock and stock options and enhances employee retention. The literature on this topic is discussed in Section 4.3 (Lakkis, 2023; Bias, 2021). Firms also use operational strategies to reduce labor mobility. Using structural estimation of a theoretical model, Ma, Wang, and Wu (2024) show that 47% of innovation specificity in U.S. firms can be explained by strategic motives to foster firm-specific knowledge, which reduces inventor mobility but increases firm value at the expense of inventors' surplus. Overall, firms use a range of tools to restrict the mobility of their workforce, which include deferred compensation with vesting provisions, making deferred compensation less liquid through delayed IPOs, non-compete agreements, and operational choices that reduce employees' outside options.

Restricting labor mobility creates externalities

While the loss of employees associated with labor mobility is costly for firms, it also has potential benefits to firms and workers if a liquid labor market reduces search frictions and permits a better matching between firms (respectively, tasks) and employees. This bright side of labor mobility is shown by Van Doornik, Gomes, Schoenherr, et al. (2024), who analyze buyers' clubs ("consórcio") for

motorcycles in Brazil. Members are randomly allocated funds to purchase a motorcycle, which significantly enhances their mobility and thus their ability to search for and accept jobs. The study finds that obtaining credits results in a 15%-20% higher commuting distance, a 16% to 21% increase in the likelihood of employment in the formal sector of the economy, and 8% to 10% higher salaries over five years. Baltrunaite and Karmaziene (2024) study how shocks to local labor markets for directors of Italian private firms affect the matching between firms and directors. They use the expansion of the high-speed railway network as a source of exogenous variation in the access to talent pools and perform two-way fixed-effect regressions with total factor productivity as a dependent variable to separately measure firm quality and director quality. They show that new high-speed train connections improve the fit between firms and directors by increasing assortative matching: the quality of boards of high-quality firms improves, whereas the opposite happens to the boards of low-quality firms.

Clifford and Gerken (2021) and Gao, Wang, and Yu (2024) analyze labor mobility in the financial industry and document different channels through which mobility increases performance. Clifford and Gerken (2021) study the financial advisory industry and compare a switch from a regime in which firms own client relationships to one in which the individual advisor owns the client relationship.[12] They find an 18% increase in employees registering as investment advisors after the switch, permitting them to offer fee-based advice, which indicates that these employees invest in long-term client relationships instead of offering commission-based products. This conclusion is also supported by the observation that these advisors experience 20% fewer client disputes, which likely indicates myopic advisor behavior at the expense of clients. Hence, the increase in labor mobility goes along with more investments in long-term client relationships. Gao, Wang, and Yu (2024) study labor mobility in investment banking and find that high-performing M&A bankers leave multidivisional bulge bracket banks for boutique banks, where compensation is more closely tied to performance, contributing to the improved performance of boutiques, which likely increases their market share. Overall, increased labor mobility improves the match between firms and employees, respectively, the incentives of top performers, thereby increasing productivity and incomes.

Whether this shift to better protection and higher reliance on human capital enhances welfare is open. This results not only from the ambiguous relationship between labor mobility and firm value (see the discussion of Chen, Li, Thakor, et al., 2024 above). Rather, a complete welfare analysis of restrictions to labor mobility would have to include the externalities imposed on other firms and on employees: Firms' access to skilled labor declines; employees lose rents to their employers and may have lower

[12] In 2004, three of the largest New York brokerage firms signed „The Protocol for Broker Recruiting," which allowed advisors who left their firms to retain some data of their clients and solicit them from other signatories of the Protocol.

incentives to invest in assets such as client relationships (see the discussion of Clifford and Gerken, 2021 above); and the quality of matches between firms and employees declines. Moreover, a complete welfare analysis would have to consider the decline in firm entry and start-up activity reported by Jeffers (2024). Shi (2023) develops a model with search frictions in the labor market that incorporates some of these externalities, and then calibrates the model to the managerial labor market. The overall conclusion is that the optimal policy is to ban non-compete clauses because the costs that incumbent employers impose on their employees and other firms are socially excessive.

3.5 Committing to employment contracts: supporting implicit contracts

In this section, we turn to the flip side of the dual commitment problem between firms and employees. Whereas the previous section asks how firms are affected by the inalienability of human capital and employees' limited commitment to the employment relationship, we now address how firms handle their limited commitment to the employment relationship. The basic notion is that employees are risk-averse and undiversified. They have at most a limited ability to insure the risks of their human capital in financial markets, whereas firms are owned by shareholders who have access to capital markets and can diversify more easily. Hence, firms have a comparative advantage in insuring employees against adverse shocks to their human capital, an idea that goes back at least to Knight (1921) and which has been formalized by Baily (1974) and Azariadis (1975).

A significant number of papers ask whether firms perform this insurance role, and the answer is generally affirmative (e.g., Guiso, Pistaferri, and Schivardi, 2005; Ellul, Pagano, and Schivardi, 2018; Kim, Maug, and Schneider, 2018; Faccio and O'Brien, 2021), although Hallock (2009) suggests that the insurance function of firms may have declined over time. This literature is large, and Pagano (2020) already provides a dedicated survey of the theoretical and empirical work on this question. The discussion in this survey is limited to the question of how firms commit to long-term employment relationships. If firms are risk-neutral and have unlimited resources, they can simply contract to pay a constant wage to workers. However, frictions in contracting imply that firms are effectively risk-averse and have only limited resources to maintain long-term employment relationships (Grossman and Hart, 1981; Malcomson, 1983). Consequently, firms will protect workers only against temporary shocks (Gamber, 1988) or idiosyncratic shocks (Guiso, Pistaferri, and Schivardi, 2005). Ideally, the conflicting objectives of firms and employees would be balanced in state-contingent contracts. However, if these cannot be enforced, the resulting employment contracts are incomplete and therefore implicit. Firms have an incentive to commit to such implicit contracts to retain workers and avoid paying higher wages to compensate workers against uninsured risks (see Sections 3.1 and 3.2 above). Hence, firms have to simultaneously ensure that these commitments are sufficiently flexible to admit exemptions but also sufficiently credible for employees. Hence, short of complete state-contingent contracts that specify

ex-ante under which circumstances firms should uphold their commitments to long-term employment relationships and when they could be exempted, firms have to find second-best governance arrangements that strike a balance between commitment and flexibility. To this end, the literature often relies on arguments related to reputation and self-enforcing contracts as commitment devices (Harris and Holmstrom, 1982; Thomas and Worrall, 1988; Rudanko, 2011). This section discusses the literature on three forms of commitment that go beyond or complement reputation: (1) managerial preferences; (2) managerial incentives; and (3) the preferences of different types of owners. The subsequent section then discusses power-sharing arrangements within firms.

Commitment through managerial preferences

A large literature has documented that the preferences and characteristics of CEOs and other top executives have a first-order impact on firms' policies.[13] Gaston (1997) develops a model in which firms benefit from delegating the administration of employment relationships to managers who can commit to implicit contracts and are explicitly permitted to transfer wealth to employees to encourage them to make investments in firm-specific human capital. If the trade-off between long-term commitment and flexibility of employment arrangements is left to managerial discretion, managerial preferences and incentives should have a first-order impact on wage setting and layoff decisions. The theoretical argument is based on the notion that individuals may have stable preferences that maximize their long-term welfare at the expense of short-term gains (Akerlof, 1983) and that firms hire such individuals as managers and entrench them to commit to long-term implicit contracts (Shleifer and Summers, 1988).

An emerging literature addresses the role of managers' preferences in this respect. He and le Maire (2022) analyze a manager-firm-worker data set from Denmark and show that manager fixed effects explain about one-third of the variation in firm wage premiums: Moving from the 10th to the 90th percentile of the distribution of these fixed effects is related to a 30% increase in the wages of non-managerial employees. This pro-employee bias is costly for managers, as they are more likely to be replaced in involuntary turnovers and their firms are more likely to be targeted in M&As, whereas firms do not benefit from increased productivity. Moreover, manager-specific wage premiums can be predicted from their education, gender, and earlier experiences of wage inequality. In a related paper, Acemoglu, He, and le Maire (2025) analyze US as well as Danish data to study how business school

[13] Earlier papers include Bertrand and Schoar (2003), Malmendier, Tate, and Yan (2011), Graham, Harvey, and Puri (2013), and Kaplan, Klebanov, and Sorensen (2012). Many studies have established the relevance of managerial characteristics for a broad range of firm policies. See Guenzel and Malmendier (2020) for a survey of this literature. More recently, a separate literature has established the relevance of managerial practices and management quality (Bloom and Van Reenen (2007); Bender, Bloom, Card, et al. (2018); Coraggio, Pagano, Scognamiglio, et al., 2025).

education shapes managerial attitudes toward employees. They show that CEOs with a business degree in the US reduce the labor share by 5% and wages by 6% within five years of their appointment (both values are 3% in Denmark), leading to a 3% increase in ROA in the US (1.5% in Denmark). They identify changes in rent-sharing behavior as a major source of their results. Using export demand shocks in Denmark as a source of exogenous variation to firms' profits, they show that a 10% increase in profits per worker is associated with a 1% increase in employees' wages if their firm's CEO has no business degree but a net increase of zero in case the CEO has a business degree.

Guenzel, Hamilton, and Malmendier (2023) show that CEOs have concerns for the employees of their firms, as their mortality increases significantly if they lay off employees. Moreover, pro-social concerns for employees increase with CEOs' tenure, consistent with the notion that CEOs' personal costs of layoffs increase as they establish more social ties within their organization: An interquartile increase in CEO tenure reduces their layoff propensity by 11%. Longer-tenured CEOs also make fewer layoffs during the holiday season and economic downturns. Hasan, Manfredonia, and Liu (2024) study the moral values of top management. They analyze transcripts of earnings calls, using textual analysis and building on moral foundations theory (Haidt, 2007; Haidt, 2012) to construct a measure of whether managers lean more toward communal values (emphasizing the in-group) or toward universalist values. They show that managers with more communal values skewed layoff decisions during the Great Financial Crisis toward employees further away from headquarters, whereas universalist managers did not discriminate across establishments with different distances to headquarters. Hence, managerial attitudes to employees matter for wage setting and employment decisions, especially during economic downturns, and these attitudes are systematically related to managers' education, tenure, and moral commitments. Overall, the four studies summarized in this section support the notion that delegating to and entrenching managers with employee-friendly values may allow firms to commit to longer-term stable employment relationships.

Committed owners

This section addresses the relevance of ownership structures for the implementation and enforcement of implicit employment contracts. Some ownership changes are associated with high employee turnover and new owners' apparent inability to retain key employees, whereas other types of owners have been associated with a stronger commitment to stable long-term employment relationships.

Family firms

Family ownership has been most consistently associated with a longer-term view of the business and, accordingly, with a higher ability to commit to long-term implicit contracts (Anderson and Reeb, 2003; Bertrand and Schoar, 2006), which is important since a large majority of firms is family-owned, even the majority of large listed firms in most stock markets, especially in civil-law countries (La Porta,

Lopez-de-Silanes, Shleifer, et al., 1999; Aminadav and Papaioannou, 2020; Villalonga and Amit, 2020).[14] At the same time, the causal impact of family ownership on employee relations is difficult to analyze, precisely because the fact that family firms have different labor relations leads to their endogenous appearance in those environments in which labor relations are either important or difficult to manage because of institutional factors (Mueller and Philippon, 2011).

Sraer and Thesmar (2007) may be the first formal investigation of the influence of family ownership on the management of human capital in family firms. For their sample of firms listed on the French stock market, they show that family-managed firms outperform matching widely-held firms and attribute this outperformance to higher labor productivity. They show that employment fluctuates less in heir-managed firms and that employees in family firms receive lower wages. These findings are consistent with the notion of family firms providing insurance to employees in return for an insurance premium, which takes the form of lower wages. Bassanini, Breda, Caroli, et al. (2013) study a later sample of French firms that also covers non-listed firms. They confirm the findings of Sraer and Thesmar (2007) and disentangle the part of the wage discount of workers of family firms that can be attributed to the insurance enjoyed in family firms from the part that results from high-ability workers matching with non-family owned firms. Their results suggest that more than half of the approximately 5% wage discount in family firms results from different wage policies of family firms and not from selection effects.

Bach and Serrano-Velarde (2015) attempt to isolate the portion of employment insurance that works through the distinct characteristics of family CEOs. They implicitly invoke the notion of "loyalty filters" (Akerlof, 1983) that are applied in families and allow parents to pass on their commitment to employment promises to their offspring. The paper tests the hypothesis that implicit contracts in family firms are protected through the appointment of CEOs from the owning family by analyzing CEO turnovers and showing that dynastic CEO transitions within the family are associated with 20% lower wage growth but also 25% fewer separations compared to transitions to external CEOs. Moreover, the commitment of families to implicit contracts becomes stronger in environments with more frictional labor markets, i.e., precisely when it is more valuable to employees. Ellul, Pagano, and Schivardi (2018) provide comprehensive cross-country evidence for the hypothesis that family firms are better at committing to long-term implicit employment contracts. They analyze 7,800 firms in 41 countries over a 25-period and show that the baseline elasticity of employment to industry sales ranges between 14% and 20%, depending on the specification, whereas this elasticity declines to between 2% and 3% for family firms. Interestingly, they show that, while family firms offer much more employment insurance

[14] See Belot and Ginglinger (2025) for a literature survey of the labor relations in family firms.

compared to non-family firms, they appear to provide less wage insurance: wages fluctuate more in family firms, potentially because they obtain wage concessions in industry downturns. Overall, the literature surveyed here, as well as that summarized in the more extensive survey of Belot and Ginglinger (2025) establish that family firms have a lower propensity to lay off employees, especially during crisis periods (see also Baù, Karlsson, Haag, et al., 2024).

Hence, the studies on the employment policies of family firms provide consistent evidence for the claim that family firms provide significantly more employment insurance, have better employment relations, and often benefit from higher performance compared to non-family firms. Some studies show, in addition, that this insurance is priced through paying lower wages to employees, even though it is not always possible to disentangle this wage effect from a composition effect, as family firms often employ less-skilled employees. More recently, Di Porto, Pagano, Pezone, et al. (2024) associate the wage discount with slower career progression and argue that family firms create a "glass ceiling" above which non-family members cannot progress in their careers. The papers in this literature discuss three different mechanisms through which family firms operate differently: the reputational gains of long-term owners; the selection of CEOs and senior managers from the family, who inherit the commitment of families to their firm's employees; and the establishment of long-term relationships between the workforce and family members. Except for Bach and Serrano-Velarde (2015), studies in this literature do not attempt to isolate the channel through which family ownership implements implicit contracts.

There is a puzzling tension between the favorable view on family firms that emerges from the literature on employment policies and implicit contracts, and other research on family firms. Researchers have generally been less positive about family firms and associate them with inferior management practices, e.g., for Italy (Di Porto, Pagano, Pezone, et al., 2024), Sweden (Coraggio, Pagano, Scognamiglio, et al., 2025) and the majority of OECD countries, in addition to Brazil, China, and India (Bloom and Van Reenen, 2010). Resolving this tension remains on the research agenda.

Other forms of ownership

Compared to the literature on family ownership, other forms of ownership have received comparatively little attention, the notable exception being private equity funds, whose activities are invariably associated with changes in ownership structure and frequently with a transition from public to private ownership; private equity buyouts are relegated to a later discussion (see Section 4.4 below). Brav, Jiang, and Kim (2015) study the impact of hedge fund activism on labor outcomes. They show that hedge funds generally improve total factor productivity and labor productivity, which are associated with a decline in employment and work hours and an increase in the capital-to-labor ratio. Interestingly, the increase in labor productivity is concentrated in highly unionized industries, for which the paper also finds an increase in hourly wages. Niu (2024) follows up on the last finding and shows

that hedge funds are more likely to target unionized firms compared to non-unionized firms. However, employee satisfaction declines and strikes become more intense after being targeted, which suggests that hedge fund ownership is detrimental to employees. Falato, Kim, and Von Wachter (2022) analyze the impact of concentrated institutional ownership on employees. They show that a 10-percentage point increase in institutional ownership is associated with a reduction of employment and wages of about 2%. Further investigations show that the losses to employees are larger in less-unionized industries and in local labor markets in which firms have more bargaining power. These changes are associated with a loss of labor productivity, suggesting that they represent a transfer of wealth rather than efficiency improvements. Moreover, not all institutional shareholders are alike: the negative effects on employees are associated with *activist* institutions (those that engage in shareholder activism campaigns) and *dedicated* institutions (using the classification of Bushee, 1998), i.e., those with control motives, whereas there is no such association for *transient* or *quasi-indexing* institutions. Finally, a small literature addresses the impact of state ownership in the context of privatizations. The findings mostly suggest that a transfer from state ownership to private shareholders increases productivity (e.g., Estrin, Hanousek, Kocenda, et al., 2009; Megginson, 2017), often by increasing the incidence of unemployment (see Olsson and Tåg, 2025b).

Børsting and Thomsen (2017) analyze private foundations in Denmark, where they are particularly prevalent, although foundations appear to be relatively common as owners in civil law countries, particularly in high-tax countries, and they are often used as vehicles to organize family ownership (Peng and Jiang, 2010; Buchanan and Kaya, 2024). They are of interest here because foundations tend to be very long-term owners. Børsting and Thomsen (2017) present evidence based on a matched-sample design that ownership by foundations is associated with higher wages, as well as longer tenure and higher education of the firm's employees.

Hence, the limited evidence that is available so far indicates that ownership by shareholders with control interests (activists, dedicated shareholders, hedge funds) leads to improvements in firm value that are not shared with employees, and sometimes to transfers of wealth from employees to shareholders, whereas other types of ownership (transient shareholders, foundations) do not have this impact. To provide a more conclusive picture of the role of ownership in labor relations, future research should address the implications of forms of ownership other than family firms, the interactions of different types of owners (family, institutions of different categories), and whether substitutes for reputational mechanisms to enforce implicit contracts, or whether reputation is simply the mechanism through which ownership is effective to this end.

3.6 Power-sharing within firms

After discussing managerial preferences and ownership types, we now address power-sharing arrangements, which form a third type of arrangement through which firms implement state-contingent agreements that simultaneously provide long-term commitments to employees and flexible arrangements that exempt firms from obligations beyond their resources. Such internal arrangements may include works councils, board seats assigned to employees (codetermination), share ownership of employees (employee stock ownership plans, ESOPs), and unionization. Several authors have observed that such power-sharing arrangements are preferable to shareholder primacy under conditions in which employees make irreversible relationship-specific investments that benefit their employers (e.g., Malcomson, 1983; Blair, 1999; Blair and Roe, 1999; Roberts and van den Steen, 2000). An early case for unionization on this basis was advanced by Malcomson (1983), who observes that it may serve two purposes: enforcing state-contingent agreements between employees and firms, and overcoming informational frictions, which arise if managers are better informed about the situation of the firm than non-managerial employees. Blair (1999) specifically focuses on firm-specific human capital as a source of friction. Later authors note that human capital becomes firm-specific not only if workers learn skills that are valued only by their employer but also if they acquire multiple general skills in proportions that are only valued by one specific employer (Lazear, 2009), or if workers physically locate themselves and their families in the vicinity of their employers, such that the change of location involved in switching employers would be costly to them (Alesina, Algan, Cahuc, et al., 2015).

Ex-ante power-sharing arrangements that provide some power to employees may be optimal (the "bright side"). However, such arrangements also imply that each side has incentives to use power to its own advantage and to secure itself a better bargaining position in negotiations. Many studies address such power struggles, which form the dark side of power-sharing arrangements. These studies can be grouped under three mechanisms that influence the balance of power between investors and employees: (1) the strategic use of debt as a bargaining tool; (2) the formation of alliances between managers and employees; and (3) collective bargaining and unionization.

Power-sharing: The bright side

One prominent example of power-sharing arrangements within firms is codetermination, whereby worker representatives obtain seats on the board of directors. Kim, Maug, and Schneider (2018) analyze parity-codetermination in Germany, where employee representatives elect half of the directors on the supervisory boards in firms with more than 2,000 employees in Germany.[15] They show

[15] Their Figure 1 also provides additional information on how wide-spread power-sharing arrangements such as works councils and board-level codetermination are. Within the OECD, only two countries – the US and Singapore

that parity-codetermined firms protect their workers against industry-wide shocks, but this insurance is only provided to skilled blue-collar workers and white-collar workers. By contrast, unskilled blue-collar workers do not seem to be covered by insurance, which the authors relate to the observation that unskilled blue-collar workers never have their own representatives on supervisory boards. Adjusting for other factors, workers in parity-codetermined firms earn 3.3% less, which is in line with the interpretation that these workers accept lower wages as an insurance premium in exchange for employment protection. Jäger, Schoefer, and Heining (2020) ask a related question by analyzing a legal reform that exempted firms incorporated after 1994 and with more than 500 employees from the one-third codetermination requirement that remained applicable to the older cohort of firms but find that the two cohorts of firms do not differ in their wage-setting behaviors. Their findings are consistent with those of Blandhol, Mogstad, Nilsson, et al. (2025), who show that minority representation on boards has no discernible influence on wages for workers in Norway. Alternative forms of power-sharing within firms include employee stock ownership plans (ESOPs) and labor-managed firms. However, while these arrangements have been analyzed in the literature (e.g., Chaplinsky and Niehaus, 1994; Kim and Ouimet, 2014; Dow, 2018), there are only a few studies about whether these forms of power-sharing between investors and employees support implicit employment contracts, most of which rely on small samples. One of the few exceptions is Pencavel, Pistaferri, and Schivardi (2006), who analyze 2,000 worker cooperatives in Italy from 1982 to 1994 and compare them to conventional, "capitalist" enterprises. Their main finding is that workers in cooperatives receive employment protection, since they are better protected against industry shocks, but they receive lower and also more volatile wages. Burdín and Dean (2009) confirm these conclusions for a study of worker cooperatives in Uruguay from 1996 to 2005. Hence, the literature on how organizational solutions other than managerial incentives and preferences, and the ownership structure of the firm, can help to substitute for explicit state-contingent contracts is small. The tentative implication of the small number of studies is that power-sharing arrangements may work as long as employees are granted sufficient but not excessive influence on firms' policies.

Power struggles 1: The use of debt as a bargaining tool

Compared to the rather small literature on the bright side of power-sharing arrangements discussed above, there is a much larger set of studies on the power struggles between firms and workers. Power struggles imply a potential trade-off between the ex-ante benefits of commitment to implicit contracts and the costs of ex-post settling up and entrenchment. Baldwin (1983), Bronars and Deere (1991), Dasgupta and Sengupta (1993), and Perotti and Spier (1993) develop formal models in which firms can

– had none of these forms of power-sharing in 2015. See McGaughey (2016) and Jäger, Noy, and Schoefer (2022) for more information about the history and institutional details of labor arrangements in Germany.

strategically use their capital structure and investment policies to limit the bargaining power of workers, but they propose different economic mechanisms and derive similar but not identical predictions. Baldwin (1983) shows that firms may maintain inefficient plants to counteract union power. Bronars and Deere (1991) and Dasgupta and Sengupta (1993) observe that employees and firms can only bargain over cash flows that have not yet been committed to other claimholders, such as creditors. Hence, if managers raise debt and pay out cash to equity holders, they increase payouts to shareholders while simultaneously reducing the cash flows that employees and firms can bargain over, which strengthens the hand of equity holders.[16] By contrast, Perotti and Spier (1993) develop a theory in which employees have a senior claim to future cash flows and firms issue junior debt. While the junior debt does not dilute the claims of employees directly, it does commit the firm to not undertake profitable investment projects in some states of the world, thus initiating ex-post bargaining over investment projects that the firm will only undertake if employees agree to wage concessions. The main difference between Bronars and Deere (1991) and Perotti and Spier (1993) is that the former predict that the increase in leverage is permanent, whereas the latter is consistent with a temporary increase, which reverts to a lower level after wage negotiations have been completed and investment projects realized. Notwithstanding these nuances, I will refer to all theories that model debt as a bargaining tool as the "strategic debt model."

Some studies have explored the empirical implications of the strategic debt model. Bronars and Deere (1991), Garvey and Gaston (2009), and Matsa (2010) all report a positive correlation between leverage and the degree of unionization. To provide a causal analysis, Matsa (2010) studies the passage of right-to-work laws in US states in the 1950s, which prohibit employment contracts that force employees to join a union, thereby reducing the bargaining power of unions. The passage of these laws led firms to reduce leverage by more than 50%. He also shows that legislation in the 1960s and 1970s that prevented workers from collecting unemployment benefits during strikes under some conditions had a similar, though smaller impact, leading to a reduction of leverage by about 20%. Monacelli, Quadrini, and Trigari (2023) develop and estimate a structural model to explain how access to credit influences employment through the *debt-bargaining channel*, which they contrast with the *collateralized lending channel* (see Sections 3.1 and 3.2). They argue that the negative impact of leverage on wages helps firms to increase employment, so that fluctuations in access to credit affect firms' willingness to hire

[16] Asymmetric information between employees and managers may create the opposite effect on payouts: Firms may use reductions in payouts as a credible signal to employees that the firm is in financial distress and needs concessions from employees to survive. This effect creates a complementarity between leverage and dividend cuts. See DeAngelo and DeAngelo (1990) for evidence supporting this view.

workers. The quantitative estimates of the paper suggest that about one-quarter of the fluctuations in US unemployment since the 1980s can be attributed to the debt-bargaining channel.

Myers and Saretto (2016) provide a dynamic perspective and analyze shifts in the relative bargaining power of firms and unions over time by analyzing the patterns of union strikes and changes in leverage at large firms in the US. They report a negative and economically large correlation between firms' leverage and the likelihood of being targeted by a union strike. Moreover, firms that experience strikes let their leverage drop before labor negotiations. By contrast, firms that are not targeted by strikes increase their leverage before negotiations and let it fall back after negotiations within two years, consistent with the dynamic predictions for leverage of Perotti and Spier (1993). Myers and Saretto (2016) also look at the reverse direction and show that firms increase their leverage after being targeted by union strikes, and more so after strikes in which the union wins, which the authors interpret as preparations for the next round of labor negotiations.

The arguments of Bronars and Deere (1991) and Dasgupta and Sengupta (1993) apply not only to leverage but also to other firm policies that affect the size of the pie over which employees can bargain with firms. Klasa, Maxwell, and Ortiz-Molina (2009) test the hypothesis that firms strategically choose lower cash holdings if they face more pressure from unions because unions find it easier to extract concessions from firms with deeper pockets. The study measures the degree of unionization at the firm and industry level and reports evidence consistent with this hypothesis. Moreover, supporting a bargaining interpretation, the authors also find that the negative effect of unionization on cash holdings is stronger in more concentrated industries, in which unions capture larger economic rents, in firms located in states that enacted right-to-work laws (see above), and in firms in which labor represents a larger fraction of total production costs. Hence, while higher cash holdings may be a useful tool to attract employees (see Section 3.2), they may also intensify competition over corporate resources. One channel through which firms can reduce cash holdings is through higher payouts. Dang, De Cesari, and Phan (2021) show that firms reduce their cash balances through share repurchases after states pass wrongful discharge laws, which increase employment protection and thus the bargaining power of employees. They estimate this increase to be 26% of the sample mean and use matched-sample differences-in-differences estimation and the staggered adoption of these laws to argue that this effect is likely to be causal. These studies show that the mechanism proposed by the strategic-debt model carries over to other methods of reducing companies' cash holdings.

There is limited evidence on the costs to employees and investors of the power struggles between firms and employees. Benmelech, Bergman, and Enriquez (2012) show that airlines with higher leverage can extract significant wage concessions from those employees whose pension funds are underfunded, and if the underfunded claims are not guaranteed by the US federal government.

According to their estimates, airlines in financial distress can renegotiate the wages of employees with underfunded pensions downward by about 10%. Chava, Danis, and Hsu (2020) compile a data set of almost 20,000 collective bargaining agreements between 1988 and 2016, and find that a decrease in union bargaining power through the passage of right-to-work laws (see above) reduces leverage, confirming the findings of Matsa (2010) for an earlier sample, and increases employment, investment, and dividend payouts. In their study of loan covenant violations, Falato and Liang (2016) show that union elections that increase labor power lead to higher loan spreads. Hence, from the limited evidence that is available so far, we can conclude that power struggles are costly for employees, through less insurance and lower wages, as well as to firms, which have to pay higher interest on their loans.

The studies discussed in this section support the predictions of the strategic debt model for leverage as well as other ways of reducing firms' cash holdings, but some other studies provide a more nuanced view. Two studies analyze employment protection laws and argue for a separate channel through which the bargaining position of workers can affect firms' capital structure choices. Simintzi, Vig, and Volpin (2014) analyze a sample of firms in 21 countries over the period from 1985 to 2017 and show that firms reduce leverage in response to increases in employment protection. Similarly, Serfling (2016) studies a sample of US firms over the period 1967 to 1995 and shows that the adoption of wrongful discharge laws by US state courts reduces market leverage ratios by one percentage point. Finally, Li, Ang, and Lu (2023) show that the adoption of wrongful discharge laws leads suppliers to reduce their provision of trade credit. These results appear to contradict the predictions of the strategic debt model, which suggests that an increase in employees' bargaining strength should trigger an increase in leverage. Some of the studies explain their findings by arguing that increases in employment protection increase bankruptcy costs, which then reduces leverage, in line with the extended trade-off theory described in Section 3.2 above. One explanation, advocated by Schmalz (2015) and Simintzi, Vig, and Volpin (2014) is that institutional changes that exogenously increase the commitment to employment relationships also increase operating leverage as wages become a fixed claim. Higher operating leverage is more costly for financially constrained firms, which then reduce leverage. This mechanism creates a countervailing force to those identified by the strategic debt model.

Ellul and Pagano (2019) develop a theory that extends strategic-debt models to incorporate employees' rights in bankruptcy and test their model in a firm-level sample of 29 countries for the period from 1988 to 2015. Consistent with the predictions of the strategic-debt model, they find that firms increase leverage more in response to an increased value of their resources (real estate values or profits predicted from commodity prices) if employees are better protected through higher seniority in bankruptcy. However, their model also predicts the opposite for the impact of employees' rights in

debt restructuring, which becomes relevant if firms are not liquidated in bankruptcy. If employees can claim a larger share of the payoffs from debt renegotiation, then it becomes more costly to trigger such renegotiations, and leverage should decline; this hypothesis is also supported by their data. Further analyses show that the data support the strategic debt model only for financially unconstrained firms: the association of employee rights with leverage reverses signs for financially constrained firms. Schmalz (2015) comes to the same conclusion using a regression discontinuity design on unionization elections in the US: unionizations increase leverage only in financially unconstrained firms but have the opposite impact in financially constrained firms, leading to a null result at the level of the entire sample.

The overall evidence provides broad support for the strategic debt model. If unions are more powerful or display more aggressive tactics, then firms reduce cash holdings and increase leverage, which earmarks cash flows for investors and makes them less accessible to employees. However, there are some important nuances to this mechanism. First, the mechanism proposed by the strategic debt model is based on increases in firm value that create demands for rent sharing from employees; examples are cash windfalls or increases in property values. By contrast, employment protection laws result in obligations to firms, especially when firm values are low, thus creating fixed commitments and increases in operating leverage, which then crowds out financial leverage. Importantly, leverage can only affect the bargaining within firms but cannot affect the stance of regulators. Second, the strategic debt model assumes that firms can choose their debt levels freely and thus does not apply to financially constrained firms that have already exhausted their debt capacity. Third, and finally, the debt-bargaining channel requires that employees earn rents, so that their outside options are not binding on firms. By contrast, if outside options are binding, then firms are concerned about attracting and retaining employees, and the arguments summarized in Section 3.2 play a more prominent role. They have opposite predictions for the connection between wages and capital structure.

Power struggles 2: Coalitions between employees and managers

Much of the argument above is framed as a conflict between employees and "firms," where firms are conceived of as cohesive units that combine managers and shareholders. However, power is effectively shared between three groups: shareholders, managers, and employees. Managers' interests may be aligned with those of shareholders, in which case it is legitimate to discuss power struggles within a simplified framework that only distinguishes employees and firms. However, managers may also align themselves with employees if the benefits of managers from doing so outweigh the incentives provided through their own equity stake in the firm. Theories along these lines have been developed by Garvey and Gaston (1997), Gaston (1997), Chemla (2005), and Pagano and Volpin (2005). The model of Pagano and Volpin (2005) identifies two channels through which labor relations can support

management in enjoying private benefits. First, managers can choose the fraction of workers with whom they have long-term employment relationships, which cannot be renegotiated by a potential raider. Such long-term commitments reduce the incentives to take over the firm and protect managerial rents. Second, short-term workers may lose an efficiency wage premium if the firm is taken over. If the manager sets up an employee stock ownership plan (ESOP), then the employees will vote their shares against takeovers to defend their rents. In both cases, employment relationships help managers to defend the company against disciplinary takeovers. Hence, management-worker alliances may entrench workers as well as management, which may have costs and benefits. For example, firms may provide workers with incentives to make firm-specific investments, which require firms to commit to long-term contracts that provide for increased deferred wage payments (see Sections 3.4 and 3.5). Such firms need to defend themselves against takeovers to uphold their commitments to employees (Garvey and Gaston, 1997). At the same time, if employees can claim some of the value created in takeovers, then these takeovers may not take place anymore because they become too costly for potential bidders (Chemla, 2005).

Takeover defenses and employee share ownership

Most studies that look at the role of employees in the agency relationship between managers and shareholders focus on the second channel identified by Pagano and Volpin (2005) and analyze the role of employees' control of voting rights in takeover contests. Employees receive voting rights either through ESOPs or through defined contribution pension (401k) plans, in which employees are encouraged to invest in the stock of their own firm, even though such stock holdings are disadvantageous from a risk-taking perspective (Meulbroek, 2005). An early contribution is Gordon and Pound (1990) who study a sample of ESOPs created or expanded during the period 1987 to 1989, predominantly in firms incorporated in Delaware, where court decisions in the late 1980s significantly enhanced the possibility of using ESOPs as takeover defenses. They find that the creation of ESOPs reduces firm value by about 3.3% to 4.6%. Interestingly, ESOPs that invest in non-voting shares are associated with a positive impact, suggesting that the negative impact of ESOPs is attributable to their control of voting rights. Later studies on larger samples (Chaplinsky and Niehaus, 1994; Dhillon and Ramírez, 1994) do not confirm the negative effect on ESOPs in general, although Dhillon and Ramírez (1994) do find significant reductions in firm values for the subset of firms subject to takeover speculation after the Delaware Chancery court's *Polaroid* decision. Chaplinsky and Niehaus (1994) also investigate the effectiveness of ESOPs as takeover defenses and show that it is large: In their sample, only 48% of takeover targets with ESOPs experience a change of control compared to 85% of targets without ESOPs.

Rauh (2006) and Masulis, Wang, and Xie (2020) confirm that voting control of employees reduces the likelihood of being acquired. Rauh (2006) also provides more direct evidence for the hypothesis that firms give voting control to their employees with the intent to create takeover defenses. He investigates the role of deferred contribution plans and argues that the importance of voting control of insiders for protecting the interests of managers should decline if legislation shifts the balance of power in favor of management. He analyzes the impact of Delaware case law that validated the use of poison pills and shows that it led to a reduction of insider equity ownership by 2.6 percentage points, of which 0.9 percentage points fall on employees. Hence, managers seem to partially internalize the costs of protecting their influence on the firm, but a significant portion of these costs is borne by employees who are encouraged to hold shares in their own firm. Masulis, Wang, and Xie (2020) measure employees' block ownership of their firm's equity for a large sample and show that firms with at least 5% employee equity ownership experience lower stock returns on acquisition announcements. These effects are concentrated in deals in which applicable business combination laws give employee blockholders the power to block unwanted takeover attempts. Hence, the Pagano-Volpin argument that voting control of employees reduces the vulnerability to takeovers is confirmed by several studies. Moreover, these studies conclude that firms with more employee voting control are less valuable and experience fewer and less valuable acquisitions.

Bertrand and Mullainathan (2003) use time variation in the adoption of anti-takeover laws across US states as a source of exogenous variation in the alignment between shareholders and managers: managers of companies incorporated in a state that enacts anti-takeover laws enjoy more protection from the market for corporate control after their adoption. They find that managers of the affected companies also pay about 1% higher wages to production workers and about 4% higher wages to white-collar workers, consistent with the notion that CEOs are biased toward those managers with whom they have more interactions. Atanassov and Kim (2009) perform a cross-country study and ask how firms address a sudden drop in operating performance depending on whether their legal environment provides better protection to investors or to employees. They report two observations relevant to the coalition formation within firms. First, large-scale layoffs of employees and top management turnover are both more likely in stronger investor-protection countries, and layoffs are associated with asset sales, which indicates that the interests of employees are aligned with management in the case of major asset restructurings. Second, asset sales are large either when investor protection is strong but also when it is very weak, in which case it is not associated with layoffs. The authors conclude that in these countries, poorly-performing firms raise funds through asset sales to raise the requisite funds for protecting the jobs of managers and employees. These asset sales are value-reducing and more prevalent in countries with stronger unions. Both studies rely on exogenous variation in the regulatory environment based on staggered changes of laws across US states,

respectively, across countries, and both conclude that a shift of power from investors to employees makes coalitions between managers and employees more likely.

Employee voting control and incentive effects

Three studies of insider voting control go beyond these analyses of the takeover-defense channel. Faleye, Mehrotra, and Morck (2006) show that firms with a block of employee-owned shares of at least 5% are worth less. These firms invest less and grow more slowly, which the authors attribute to the fact that employees hold undiversified portfolios and use their voice in the firm to reduce risk. Cronqvist, Heyman, Nilsson, et al. (2009) analyze Swedish data and find that CEOs' voting control influences how they compensate their employees. They find that CEOs who command more voting rights compared to the voting rights of all other large blockholders of the firm combined pay their workers about 5% higher wages. However, this effect is mitigated if CEOs also have a higher exposure to the firm's cash flow rights, which by itself leads to a reduction in wages. Kim and Ouimet (2014) try to separate the two channels through which ESOPs may affect firm value: through their role as takeover defenses, as argued in the earlier literature, and through their role in providing employee incentives. They split their sample by the number of employees and by the size of ESOPs and argue that the takeover-defense channel is relevant only for ESOPs that are sufficiently large to provide voting power, whereas the incentive channel is relevant only for smaller firms, because employees can free ride on the efforts of others in larger firms. Kim and Ouimet (2014) show that smaller ESOPs adopted by firms with fewer employees significantly increase productivity: These firms exhibit increases in wages and Tobin's Q of around 20% after ESOP adoption. By contrast, firms with many employees experience large wage increases if the firm is in a state that provides employees with more power in takeover contests, consistent with the efficiency-wage channel analyzed in Pagano and Volpin (2005). The importance of distinguishing between voting control and incentive effects is also apparent from the earlier findings of Gordon and Pound (1990) reported above, who find that the impact of ESOPs changes signs depending on whether they are invested in voting or in non-voting shares.

The cash-flow exposure of incentive contracts and career concerns may counteract managers' tendency to align themselves with employees. Hallock (1998) studies a sample of layoffs during the recession in the early 1990s and finds a positive correlation between layoffs and CEO compensation. However, both variables depend highly on firm and CEO characteristics, and this correlation vanishes after including additional controls and fixed effects. Hallock (1998) concludes that, conditional on being matched to a certain firm, CEOs do not experience pay increases after layoff announcements. Di Addario, Pezone, and Saggio (2023) study the implications of cyclical board appointments in Italy, where directors are up for reappointment to the board every three years. The authors argue that the prospect of losing their jobs creates stronger career concerns for the board members closer to the

time when their contracts expire. Consistent with the hypothesis, they find that wages exhibit a cyclical pattern, with wages rising in the first year of a board's term, peaking at the beginning of the second year, and dropping by 0.5 percentage points in the third year. Further investigations suggest that these cycles are related to hiring policies. Hence, there is limited evidence that CEO incentive contracts and career concerns affect wage setting and layoffs. However, while the literature that documents the relevance of managerial preferences and attitudes toward employees is relatively consistent (see above), there is not much work on the relevance of managerial incentive contracts and career concerns to this effect, and this field may warrant further study.

Overall, there is broad agreement across studies that insider voting control, by non-executive employees as well as by management, has a first-order impact on whether managers align themselves with employees or not. However, several studies also nuance this perspective by pointing out that it is important to separate the cash-flow exposure from the voting rights associated with equity ownership, as they typically work in opposite directions.

Power struggles 3: Collective bargaining and codetermination

Codetermination is similar to equity ownership in corporate governance in giving employees decision-making rights in the firm, either through works councils or through selecting directors. However, codetermination differs from equity ownership since it does not provide employees with cash-flow incentives. In Germany, corporations with more than 2,000 domestic employees are required by law to cede half of the seats on the supervisory boards to employee representatives. Several studies analyze how this shift in power toward employees affects companies' policies and valuations. Gorton and Schmid (2004) compare German firms that are subject to parity-codetermination with those in which employees select less than half of the directors on the supervisory board. They ask whether employees use their voice in the firm to further their own objectives and show that parity-codetermined firms have a 50% longer payroll, indicating that employees use their power to maintain higher employment levels in the firm. The paper also finds that, on average, parity-codetermined firms are worth 31% less compared to non-parity firms, measured by Tobin's Q, although Kim, Maug, and Schneider (2018) find no significant difference in a later study.

Lin, Schmid, and Xuan (2018) apply two identification strategies to analyze how parity codetermination in Germany affects financial leverage. They exploit the 2,000-employee threshold to apply a regression-discontinuity design and then use the passage of the law in 1976 for a difference-in-differences setting. The results from both analyses support the conclusion that increased employee power increases financial leverage. Then they ask whether the increase in leverage results because firms use leverage as a bargaining tool (see above), or whether it should be attributed to the congruence of interests between employees and debtholders, both of whom have largely fixed claims

against the firm. Analyzing loan spreads and exogenous variation in bank ownership, the paper shows that parity-codetermined firms have higher leverage only if their equity is not held by banks; they confirm their findings using a tax-based instrument for exogenous variation in bank ownership. Similarly, firms with higher equity ownership have lower loan spreads. The authors conclude from these findings that the association between leverage and codetermination should be attributed to the interest alignment with debtholders and not to the debt-bargaining channel. Lin, Schmid, and Sun (2019) use similar identification strategies, a regression-discontinuity design around the 2,000 domestic-employee threshold, and a law change in 2009, and show that the increased power of employees in firms leads to about 20% to 40% higher executive compensation. These results are in line with the hypothesis that increasing the power of employees reduces the power of shareholders and leads to a higher alignment of incentives between employees and managers. Hence, firms in which employees have more power seem to increase rather than reduce the ratio of CEO to average-worker compensation, and the authors argue that employees accept higher executive compensation in return for higher job security for themselves.

The boundaries of the firm do matter for the internal balance of power between firms and employees. Silva (2021) estimates that the elasticity of the wages of workers in low-wage divisions of the firm is 0.14 relative to the wages of workers in high-wage divisions. He shows that the association is likely to be causal: Exogenous wage shocks associated with the implementation of NAFTA or with state-level increases in minimum wages, which affect only some plants of the firm, increase wages in other plants of the same firm that are not affected by these shocks. Similarly, Maksimovic and Yang (2024) show that unionized plants not only pay higher wages compared to non-unionized plants, they also provide lower incentives to non-managerial employees: unionized plants are 26% less likely to have performance-based bonuses and also less likely to base promotions and dismissals on performance. Incentives are strongly associated with performance, as plants with higher incentives invest more and grow faster. Moreover, there are spill-overs in partially unionized firms, in which non-managerial incentives are not only lower in their unionized plants but also in their non-unionized plants.

Summary on power sharing

We can conclude from the papers reviewed in this section that *ex-ante*, it may well be second-best optimal to give shares of cash flows and ownership rights to all constituents who provide critical inputs and need to make commitments to the firm. Ex-post, each side can use its power in a positive way to uphold commitments and in a negative way to extract rents from other stakeholders. Breaking up power-sharing arrangements that have become dysfunctional because of the second effect may require ownership changes, which form the topic of Section 4.

3.7 Summary and implications

This section starts by asking which mechanisms may account for the relationship between the trend in technology toward human capital and intangibles, and trends in corporate finance. The review of the literature on the extended trade-off theory in Sections 3.1 and 3.2 supports mechanisms that relate intangible capital to lower leverage. Similarly, the literature on financial constraints and labor mobility shows how the capital structure of the firm is related to deferred compensation, which in turn relates to shifts in payout policy and cash holdings. Hence, it seems justified to conclude that the relationships between all these trends are causal.

However, the causal connection is more nuanced than a simple cause-and-effect mechanism that links technological change to developments in corporate finance. It turns out that firms need to manage two sets of constraints: financial constraints and human resource constraints. These constraints interact in intricate ways: financial constraints make firms riskier and less attractive as employers since financing-related risks increase the risks to employees' human capital. Hence, lack of access to finance may also limit firms' access to human capital. Since a lack of access to human capital reduces future cash flows and firm value, it also exacerbates financial constraints. Hence, the need to simultaneously access financial as well as human resources creates a "chicken-and-egg" problem, which firms can overcome by dynamically prioritizing whatever is the most binding constraint at each point in time. How they do this over their life cycle is the topic of the next section.

Neither firms nor employees can commit to long-term employment relationships: firms may run out of financial resources, and employees' human capital is inalienable. Second-best solutions include the delegation of decision-making to owners or managers with preferences that allow them to favor long-term value over short-term gains. However, commitment to delegation contracts and ownership claims is limited. Alternatively, power-sharing arrangements may allow firms and employees to credibly commit to long-term strategies. However, while power sharing between stakeholders has a bright side and may be optimal *ex-ante*, it is fragile as each side can become entrenched and extract rents from the relationship, rendering it dysfunctional and triggering power struggles. The next section discusses how transactions such as buyouts, mergers, and IPOs mark major shifts in this fragile balance of power.

4 Investors and employees over the life cycle of the firm

This section analyzes corporate transactions that induce a shift in the balance of power and in the governance of the firm. The focus is on how firms manage and prioritize the twin constraints of access to finance and access to human capital over their life cycle and how they address situations in which the ownership and governance structure of the firm is no longer optimal. The next part develops a

conceptual framework. The subsequent parts of this section discuss start-up firms (Section 4.2), initial public offerings (Section 4.3), private-equity buyouts (Section 4.4), and mergers and acquisitions (Section 4.5).

4.1 Conceptual framework

Many of the theoretical frameworks used in the previous section are static and describe how financial contracting and the allocation of power and residual control rights resolve the trade-offs firms are facing at specific points in time. However, these arrangements may need to be changed over the firm's life cycle. First, the optimal resolution of these trade-offs is necessarily changing since it is state-contingent and adapts to new technologies and input requirements, which change as firms grow and accumulate resources. Thus, the relative importance of access to financial capital and access to human capital may shift, therefore changing which constraint firms need to prioritize and, thereby, the structure of optimal contracts and assignments of control rights. Second, as argued in the previous section, control rights can be used for entrenchment and render the distribution of power suboptimal and even dysfunctional.

The optimality of different forms of ownership and firm organization, and how they depend on the nature of the input factors, has been noted in earlier literature (Alchian and Demsetz, 1972; Fama and Jensen, 1983). Many contributions have noted how firms change as they move through different life-cycle stages from start-up and venture capital to mature firms that access public markets, and how these stages correlate with payout policy (DeAngelo, DeAngelo, and Stulz, 2006), financing sources (Berger and Udell, 1998, cash flow patterns (Dickinson, 2011), and investment behavior (Hasan and Cheung, 2018). However, the literature did not integrate these findings into a theory of firms' life cycle or build on Alchian and Demsetz (1972) and their notion of a dynamically optimal ownership structure. Thus, there is no accepted theory of the driving forces that propel firms through their life cycle stages, or that addresses how firms' resource needs and the constraints binding on their operations change over their life cycle.[17] No such theory can be developed here. Instead, existing theories can be used to highlight three important ideas that I will draw on, and which may serve as building blocks of a more complete theory.

The first idea is the state-contingent allocation of control rights. Pioneers in this direction are Aghion and Bolton (1989), (1992), who show how leverage and bankruptcies implement state-contingent

[17] See the survey by Denes, Karpoff, and McWilliams (2017) for a related discussion. Penrose (1959) is the classic reference on the life-cycle theory of the firm in management literature, which builds on learning processes, managerial capabilities, and the concept of firm-specific, non-tradeable resources. Jovanovic (1982) is an economic theory based on learning processes but has no implications for ownership, sources of financing, or the role of human capital. Atkeson and Kehoe (2005) present a model of the life cycle of plants, not firms, and the financial aspects relevant here do not appear in their model.

contracts. Jaggia and Thakor (1994) apply this idea and show how leverage may be chosen to trigger ownership changes that create optimal incentives to invest in firm-specific human capital. Ewens and Malenko (2024) extend a similar notion to the composition of boards of directors, which changes optimally over time. They argue that independent directors can assume a mediating role between the interests of investors (venture capitalists) and the owners of human capital (entrepreneurs) to optimally shift bargaining power and implement decisions that increase surplus as the firm moves through different stages of its life cycle.

The second idea centers on how firms build a reputation over time. The key notion is that young firms rely on financing through intermediaries that monitor firms to overcome adverse selection and moral hazard problems. As investors observe a firm's track record over an extended period of time, they gain more trust in the firm, which can then switch to financing through public markets. This idea has been explored for equity markets (Chemmanur and Fulghieri, 1999) and debt markets (Diamond, 1991) and combines the notion of reputation-building over the life cycle with the certification role of intermediaries. We can think of firms' reputation with investors as an intangible asset. As such, these theories develop the idea that firms change their ownership structure and financing sources as they develop these intangible assets.

The third idea is the standardization of the business model as a strategy to attract investors, formulated by Rajan (2012). He argues that firms have to master two critical transitions. The first transition ("differentiation") involves the development of a unique business model that distinguishes the firm from its competitors and allows it to enter the market by placing a new product or service. At this stage, the firm relies on the human capital of key employees, especially that of the entrepreneur. However, while uniqueness provides an advantage in the product market, it creates frictions in capital markets since it makes the business model of the firm hard to communicate to investors, who may hesitate to finance a firm with human capital that is difficult to replace. Hence, the firm can only grow and attract investors by passing a second stage ("standardization"), in which the human capital of the firm becomes replaceable and thus more liquid, and the organizational structure, and thus the business model, becomes more recognizable to outside investors. To the best of my knowledge, Rajan's is the only theory that explicitly considers how resource requirements influence optimal governance arrangements over the life cycle of the firm.

4.2 Start-up firms

Start-up firms form the beginning of the life cycle of the firm. They need to solve the "chicken-and-egg" problem of persuading employees to join a risky venture rather than a more established firm, and of raising funding from investors to get commitments from employees. Following Rajan (2012), start-ups lack a standardized business model and cannot use public markets. They also lack pledgeable

capital and the opportunity for collateralized borrowing from banks; thus, they need to rely on specialized investors like angel investors or venture capitalists. The literature on the employees of start-ups discusses two broad topics: first, start-up firms are subject to constraints in hiring and retaining employees, including employees with sufficient skills to ensure the success of start-ups; second, start-ups move through a life cycle with several stages and the composition of the management team as well as the balance of power between providers of human and non-human assets changes as start-ups move through these stages.

Attracting and retaining employees is crucial for start-up formation and survival

A recent strand of literature establishes that young firms and establishments pay a premium to their workers, thus overturning earlier evidence of a positive association between firm age and wages (Brown and Medoff, 2003). The earlier finding was puzzling because young firms are arguably more risky and thus less attractive employers. Since firm risk has been found to be an important criterion for employees when they evaluate potential employers (see the discussion under "The risk premium in wages" in Section 3.2), we would expect start-ups to pay a premium. Babina, Ma, Moser, et al. (2019) formalize this prediction and test it on US data, and Schmieder (2023) tests a similar prediction on German data. However, different from prior research, they observe that the matching between firms and employees may confound estimates and control for employee and firm (or establishment) fixed effects using the AKM method (Abowd, Kramarz, and Margolis, 1999; see Kline, 2024 for a discussion of this method). Babina, Ma, Moser, et al. (2019) find that young firms (firm age below three years) pay a small but statistically highly significant premium of 1.7 log points relative to older firms in specifications that control for unobserved heterogeneity and time-varying worker characteristics (education, age), but controlling for worker-fixed effects is the most critical deviation from prior literature: young firms systematically hire lower-paid workers but pay them a higher wage than the same workers would earn at more mature firms.

Schmieder (2023) uses establishments as a unit of analysis and compares the wages of newly-hired workers in establishments that are at least 20 years old to those in newly-founded establishments, which may be set up by existing firms. He shows that newly-founded establishments pay between 9 and 11 percent more to new hires, depending on the empirical specification. However, he provides additional evidence that speaks against the unemployment-risk channel: industries in which unemployment risk declines sharply with establishment age have a relatively flat wage-age profile, whereas industries in which unemployment risk is less related to establishment age show the opposite. Instead, Schmieder (2023) favors the "monopsony channel," which builds on the observation that labor supply is inelastic so that establishments that grow faster and attract more workers from existing firms, who have higher reservation wages, need to pay a premium. Adrjan (2018) and Burton, Dahl, and

Sorenson (2018) analyze the relationship between firm age and wages for, respectively, the United Kingdom and Denmark; they both show that young firms pay a wage premium. Hence, there is consistent evidence that start-ups pay a wage premium, but it is more likely that this premium arises because they need to lure workers from existing firms and not as a compensating differential for the higher unemployment risk of start-ups.

Some studies analyze the hiring decisions of start-up firms, how they change over the start-up life cycle, and how success in hiring in the early stages of the firm contributes to the long-term success of start-ups. Ouimet and Zarutskie (2014) compare the age composition of the labor force of younger and older firms and show that younger firms display a strong bias toward hiring younger employees and pay a premium to the young workers they hire. The authors attribute this finding to young workers having a higher risk tolerance and more current technical skills, which may be more important worker characteristics for start-up firms. In addition, start-ups that are set up with more young employees are more likely to raise funding from venture capitalists, and are more likely to fail, but, conditional on survival, experience higher growth rates. Moreover, using demographic instruments, they show that the availability of younger workers contributes to a higher rate at which young firms are created. Core, Ryduchowska, and Wang (2024) study how the hiring practices of start-ups change at the stage when they receive the first round of venture capital funding. Using resume data for more than 5,500 US companies between 2010 and 2020, they show that VC funding doubles the number of employees in the year of receiving funding. Employment growth is associated with increased turnover and more separations, a shift of the labor force away from R&D and operations toward finance and sales, and an increase in organizational complexity with more hierarchical layers and departments. Hence, firms do not simply scale up their labor force as they grow but also change their composition and organization. Babina, Ma, Moser, et al. (2019) analyze how hiring success at the start-up phase is correlated with the later success of these firms and find that firms that initially hire workers with higher AKM worker fixed effects have a higher likelihood of surviving and growing ten or more years later. In summary, the human capital of young firms predicts subsequent firm success.

Chen, Hshieh, and Zhang (2021) study two natural experiments to investigate the same question. The rationing of work visas in the US and the allocation of visas to successful applicants by lottery created an exogenous source of variation in the supply of skilled foreign workers to start-ups. They show that a one-standard-deviation increase in the lottery-win rate for start-up firms increased their likelihood of venture capital funding by 7.1% and the number of patents by 6.2% three years after the lottery. Finally, Bernstein, Townsend, and Xu (2024) analyze job search during the economic downturn caused by the COVID-19 crisis, which made start-up firms appear more risky to job seekers but also reduced the outside options of employees in existing firms. They document a “flight-to-safety” effect: job

seekers favored larger firms after the onset of the crisis. The average size of firms searched by candidates increased by 29%, biasing applications toward larger firms and away from less-established start-ups. Moreover, the negative effect was concentrated in less-established firms and driven by high-quality job seekers. Ultimately, less-established start-ups reduced hiring.

A complementary set of papers investigates the factors that induce a flow of employees from existing public firms to start-ups. An early study of this "entrepreneurial spawning" is Gompers, Lerner, and Scharfstein (2005), who show that these departures tend to come from entrepreneurial firms located in innovation clusters (e.g., Silicon Valley or Massachusetts) and backed by venture capital. Moreover, employees are less likely to leave their existing employers if the latter have high sales growth and more likely to form start-ups if growth slows down, suggesting that more start-ups are formed if the opportunity costs for doing so are lower. The last conclusion is supported by Starr, Balasubramanian, and Sakakibara (2018), who show that the rate of start-up formation through within-industry spinouts (start-ups founded by the employees of an existing firm in the same industry) is lower in locations in which non-compete clauses are enforced. Babina and Howell (2024) investigate how employees take the R&D output of existing firms to found start-ups and show that corporate R&D has a large effect on start-up formation: A one standard deviation increase in R&D, which corresponds to doubling it, predicts an 8.4% increase in the rate at which employees depart their employers to set up their own firms. Further analyses show that employees take ideas and technologies to startups that are created through the R&D of their existing employers but not pursued by them, because these ideas are outside their scope: the new start-ups tend to be in different industries and are not related to the patent output of existing employers. Overall, there is consistent evidence that the ability to attract and retain qualified employees is critical for start-up formation and success, and that the ability to attract funding depends to some extent on their access to human capital.

The role of human capital over the life cycle of a start-up

The success of start-ups is often associated with the critical role of the founder's human capital. Moreover, start-ups are not one homogeneous stage in the life cycle of the firm; they move through several stages, from seed financing to product development and, finally, if successful, to the exit of the initial financiers. Several studies have contributed to our understanding of the role of the human capital of the management team and how it changes over the start-up's life cycle. Two early studies emphasize how the composition of the management team, human resource policies, and the internal organization of the firm undergo a process of professionalization. Using interview and survey data, Hellmann and Puri (2002) show that companies financed by venture capital are faster to professionalize: they are more likely to hire professional managers (e.g., vice-presidents for specific functions), replace the founder-CEO with an outsider, and use improved recruitment processes.

Moreover, venture capitalists are most critical for attracting a new CEO in the earlier stages of the start-up.

On the same question, Wasserman (2003) observes that the replacements of founder-CEOs in a sample of 202 internet start-ups are often associated with certain milestones such as successful product development and completion of venture-capital financing rounds. However, these studies only provide evidence for associations and leave it open whether founder-replacements and the professionalization of management are causal for the success in acquiring funding from venture capitalists, or whether venture capitalists enforce such changes after they gain bargaining power in funding rounds, which dilute the equity stakes of initial owners (see Ewens and Farre-Mensa, 2022). Ewens and Marx (2017) provide causal evidence on these questions by using changes in the enforceability of non-compete agreements as an instrument for the supply of executives available to replace the founder. (See the discussion under "The welfare costs of restricting labor mobility" in Section 3.4 for details on this instrument.) Using this instrument, they show that replacing the founder has a positive impact on the likelihood of a successful exit through going public or an acquisition.

Complementing the research on the management team and the CEO, Ewens and Malenko (2024) study how the composition of the board of directors changes through the different stages of start-ups, and characterize three stages: an early stage, in which the board is dominated by the entrepreneurs, a late stage, in which it is dominated by investors, typically venture capitalists, and an intervening stage with "shared control," in which neither investors nor entrepreneurs dominate and independent directors have the casting vote, thus serving as tie-breakers. The authors argue that this structure is likely optimal if start-up firms go through a phase in which the commitments by providers of financial capital, as well as those of human capital, are both important and require that decisions reflect some "middle-ground" between the interests of both parties.

The relative importance of human and non-human assets for the success of start-up firms is still subject to an open debate. In their paper "Should Investors Bet on the Jockey or the Horse?" Kaplan, Sensoy, and Strömberg (2009) show in a study of 50 start-up firms that finally went public that the business models of these firms are remarkably stable, whereas the composition of management changes over the stages of the start-up life cycle. They interpret their finding as implying that the business model of the firm (the "horse") is ultimately more important than the management team (the "jockey"), which can be replaced. By contrast, Bernstein, Korteweg, and Laws (2017) conduct a randomized field experiment among investors and come to a different conclusion. They exogenously vary the information provided to investors on an online platform that matches start-up firms to potential angel investors. Their main finding is that investors react strongly to information about the operational capabilities of the founding team, whereas information about the track record of the firm ("traction")

and the composition of its existing investor base are less important. However, the authors observe that their paper focuses on the early stage of a start-up, in which human capital is arguably more critical.

Overall, these studies paint a rich picture of the interplay of employees' perception of employment opportunities at start-ups, employee characteristics, wage-setting, and how these factors influence hiring and the composition of the workforce of start-ups, and, ultimately, start-up success. The most important conclusions are that human-capital constraints are of first-order importance for start-ups, that overcoming these constraints is critical for the ability to overcome financial constraints and, ultimately, start-up success, and that start-ups pay a premium to attract human capital.

4.3 Going public

The most significant shift in the transition from privately-funded start-ups to publicly-listed firms is that this transition typically occurs much later now than it did as recently as the 1990s.[18] Commentators have diagnosed that the US developed a "listing gap," i.e., a decline in the number of listed firms relative to the expected number based on factors that forecast the frequency of IPOs (Doidge, Karolyi, and Stulz, 2017; Lattanzio, Megginson, and Sanati, 2023; see Koptyug, Persson, and Tåg, 2020 for a literature survey on the declining number of listed firms). Kahle and Stulz (2017) compare the number of IPOs during the 2001 to 2015 period to those in the period from 1980 to 2000 and find that "the average yearly number of initial public offerings after 2000 is roughly one-third of the average" of the earlier period (see also Kenney, Patton, and Ritter, 2012 for a similar finding). They also report that the average age of a firm, measured since the time of incorporation, increased from 11 to 12 years in the period before 2000 to more than 18 years after 2000, while the proportion of small firms, defined as having a market capitalization below $100 million in 2015 dollars, declines from more than 60% in the pre-2000 period to barely more than 20% in 2015. Lattanzio, Litov, Megginson, et al. (2023) link this development directly to the emergence of "growth equity" as a separate asset class, which they place between buyout funds and venture capital: like buyout funds, growth equity funds invest in more mature and profitable firms, but, like venture capital funds, they only acquire minority stakes. Coalescing data from various sources, they show that the number of growth equity funds almost tripled, and their global total net asset value grew fourteen-fold between 2000 and 2021, a period during which the market capitalization of the listed companies worldwide increased about

[18] This discussion does not attempt a complete discussion of why the number of IPOs has declined, or why IPOs occur later than previously, let alone a survey of IPO research more generally. See Lowry, Michaely, and Volkova (2017) for a recent survey of the literature on IPOs and a discussion of stylized facts.

threefold. The authors conclude that private equity funds thus became "second only to retained earnings as a net source of equity capital for global companies."

The shift in equity funding from public to private markets is puzzling, and several overlapping explanations have been advanced for the fact that firms prefer private funding. These explanations center broadly on two paradigms, which are the subject of the next two sections, and both of which relate the decision to go public to human capital, the first to the human capital of entrepreneurs, and the second to the protection of the intangible capital of the firm. A third strand of the literature describes which aspects of firms' workforce and organization change at the time of the IPO and which aspects are not – or are no any longer – associated with the IPO stage.

Are private firms better at protecting the human capital of founders and entrepreneurs?

Boot, Gopalan, and Thakor (2006); (2008) develop theoretical arguments to explain why founders prefer staying private to protect their unique entrepreneurial vision. In both papers, entrepreneurs and investors may have differences of opinion, i.e., they share the same information but do not come to the same conclusion when they update their beliefs based on this information. Entrepreneurs then trade off the benefits of public ownership, which offers liquidity and a lower cost of capital, against the benefits of private ownership, which allows them to tailor the governance structure of the firm and to protect the entrepreneurs from being overruled by investors who do not share their views ("vision") of the firm's projects and its business model. To the extent that the uniqueness of entrepreneurial vision is more important for human-capital-intensive firms, this theory may explain the increasing delays in the decision to go public. This explanation overlaps with the argument that the decision to go public marks the transition from a unique to a more standardized business model that is recognizable by investors (see Section 4.1). It also explains why technology firms increasingly prefer dual-class share structures when going public, which allow them to combine public ownership with enhanced managerial autonomy for the entrepreneur (see also Aggarwal, Eldar, Hochberg, et al., 2022, and Field and Lowry, 2022). The observation of higher tensions between managers and shareholders in such dual-class firms in Field and Lowry (2022) would be predicted by the model of Boot, Gopalan, and Thakor (2008) and would be consistent with the minimization of agency costs. Survey evidence supports the notion that the preservation of decision-making autonomy is one of the main reasons for firms to remain private (Brau and Fawcett, 2006).

To explore the same question, Anderson (2023) explores an assignment model in which firms differ in terms of size, managers differ in terms of talent, effort cannot be monitored, and the technology exhibits strong complementarity between capital, management talent, and management effort. He then contrasts two contracting regimes. In the first regime, shareholders have the bargaining power and hire a manager, who is then provided with an incentive contract. In the second regime, the

manager-entrepreneur is the founder and has the bargaining power when procuring funds from investors and becomes the residual claimant. The main result is that the second regime dominates the first regime regarding the maximization of social surplus. The key observation is that managers may be wealth-constrained, whereas investors are not. Accordingly, when investors have the bargaining power and propose a contract, they leave a rent to the manager to provide adequate incentives, and thereby trade off the increase in overall surplus against the minimization of the manager's rent. By contrast, maximization of the entrepreneur's objective is not subject to such a constraint, and, thus, is not associated with an inefficiency. In the context of the discussion above, the first regime can be seen as a model of public funding, whereas the second regime is more akin to funding through private equity. Hence, public funding may be less efficient, not only for entrepreneurs but also socially, because the limited wealth of the manager creates an additional constraint on optimal contracts.

In summary, the theoretical literature has identified multiple mechanisms that all support the notion that more human-capital-dependent firms may benefit from staying private to protect the human capital of founders and entrepreneurs. By comparison, the empirical literature on this topic is still scant and has not yet identified how important these mechanisms are.

Are private firms better at protecting firms' intangible capital?

A second group of studies tries to establish that private ownership provides a better economic environment for developing and protecting the intangible capital of the firm. Based on a theoretical model, Ferreira, Manso, and Silva (2014) argue that private firms offer a higher tolerance for failure. Their main assumption is that public firms disclose more information to investors, which makes cash flows observable, whereas private firms do not. The disclosure of cash flows provides early information about the likely success of projects, which creates short-termism and a bias toward investing in conventional projects with a high probability of generating short-term cash flows. Ferreira, Manso, and Silva (2014) identify the decision to go public with the transition of a firm from exploring new ideas and business opportunities to exploiting existing ideas. Thus, while building on different frictions, their argument resonates with Rajan's (2012) transition from a unique business model ("exploration") to a more standardized business model ("exploitation") and associates this transition with the decision to go public. Consistent with this notion, Bernstein (2015) finds that firms produce less novel patents with fewer citations after going public. They lose key innovators to startups and shift from generating patents internally to buying them by acquiring other firms. Hence, the requirement for public firms to pursue a business model that can be communicated to a large number of dispersed investors who require standardized disclosures creates costs of going public for innovative start-ups.

Bias (2021) and Lakkis (2023) both investigate the hypothesis that IPOs increase labor mobility and that human-capital-dependent private firms delay IPOs to prevent employees from leaving the firm.

The proposed mechanism in both papers is that start-up employees receive stock options, which require employees to pay the exercise price and capital gains taxes when they exercise these options. While employees of public firms can pay with the proceeds from selling shares, those of private firms cannot. Bias (2021) uses instruments for the timing of IPOs and studies inventors for whom employment dates can be inferred. He asks how IPOs affect the labor mobility of inventors with vested options relative to those with unvested options, since the liquidity created by a public listing matters only for employees with vested options. His main finding supports the proposed mechanism by showing that inventors with longer tenure, which proxies for the vesting of options, are more than 40% more likely to leave the firm compared to those with only a short tenure at the firm, who do not become more mobile after the IPO. Moreover, IPOs facilitate the assortative matching between productive innovators and innovative firms, which suggests that restrictions on labor mobility impose externalities on firms that would hire those employees who are prevented from moving. Lakkis (2023) addresses the impact of IPOs on labor mobility by asking whether changes in labor mobility influence the timing of IPOs. He uses non-compete agreements to provide exogenous variation in labor mobility (see the discussion under "Restricting labor mobility" in Section 3.4 for more details) and finds that firms are 3.9 years younger at the IPO stage after an increase in the enforceability of non-compete agreements, and that this effect is strongest in the subsample of firms that granted more stock options to their employees.

Davydova, Fahlenbrach, Sanz, et al. (2024) argue that going public is especially costly for firms in the early stages of their development if they rely strongly on organizational capital, conceptualized as the ability to train employees, and to match them to jobs, to physical capital, and to teams of other employees in such a way that increases output.[19] Among several other reasons to support this hypothesis, they argue that investments in organizational capital and innovations in managerial processes make firms more vulnerable to the transparency required from public firms because these forms of intangible capital cannot be protected through patents. Using databases on start-ups, some of which achieved unicorn status, and an exogenous shock to the patent protection of business processes, the paper shows that firms delay IPOs if they are more vulnerable to the impairment of their organizational capital.

In summary, empirical studies of delays in the decision to go public converge on the conclusion that intangible capital is better nourished in private firms, which are better suited to taking a long-term

[19] There are several closely-related definitions of organizational capital. The definition given in the text summarizes the key models in Prescott and Visscher (1980), who are usually credited with coining this term and seems to correspond to the definition of the authors. See Carlin, Chowdhry, and Garmaise (2012) for a formal model and Bruhn, Karlan, and Schoar (2010) for the closely-related concept of "managerial capital."

view, tying employees to the firm, and protecting unpatented innovations. Hence, access to public markets may simultaneously relax firms' financial constraints but potentially exacerbate their human-capital constraints.

Employees after going public

Kenney, Patton, and Ritter (2012) and Borisov, Ellul, and Sevilir (2021) both show that firms that are younger at the IPO stage grow much faster than those that go public at a later stage. This observation suggests that some firms still go public early and before their expansion phase, resulting in fast post-IPO employment growth, whereas others go public after the expansion phase, so that their IPOs are followed by slower growth. Hence, delaying the decision to go public implies that it is moved to a later stage after the expansion phase in the life cycle of the firm, which raises the question of which changes to employment levels, the composition of the workforce, the business model, the governance, and the investor base of the firm are associated with the beginning of the expansion phase, and which ones are associated with the decision to go public, given that these two milestones are increasingly dissociated.

Three studies address the overall employment growth after IPOs. This analysis is of interest to the public debate since some commentators associate the declining number of IPOs directly with declining economic dynamism and a lack of job creation (Weild and Kim, 2009). However, estimates of the post-IPO employment growth and the interpretation of these estimates for how important IPOs are for job creation differ widely across studies. Kenney, Patton, and Ritter (2012) provide a descriptive analysis of a sample of approximately 2,700 IPOs from 1996 to 2010 and show that IPO firms add 36% to the employment they had at the time of the IPO within the first three years after the IPO, a compound growth rate of 11%. Borisov, Ellul, and Sevilir (2021) use an IV strategy by comparing 2,914 completed IPOs to non-completed IPOs for the period from 1990 to 2010 to establish a causal link between IPOs and employment growth and conclude that compound employment growth after the IPO is 37% in the IPO year and that firms with completed IPOs double their employment by the end of the second post-IPO year relative to firms that withdraw the offering. Finally, Babina, Ouimet, and Zarutskie (2025) use the same IV strategy for a sample of 3,400 completed IPOs from 1992 to 2006 and estimate the annual compound employment growth rate post-IPO to be 22%, somewhere between the estimates of the two other studies. All studies agree that a likely channel for post-IPO employment growth is that IPOs relax financial constraints, but they also note that not all employment growth can be regarded as net job creation, because IPO often go public to obtain an acquisition currency to purchase other firms, and firms become very active acquirers immediately after going public (Celikyurt, Sevilir, and Shivdasani, 2010; Brau and Fawcett, 2006). However, disentangling organic growth from growth through acquisition seems to be infeasible with the data sources used. In addition, some of the growth

that could have been realized by IPO firms may now be realized by private firms. Hence, the question of how much IPOs contribute to job creation remains unanswered and may not even be a good question, since the function of IPOs for firms' growth seems to have changed.

The growth of firms associated with IPOs may involve more than a simple scaling up of the existing labor force but also require significant turnover and changes in the composition of the workforce, given that larger organizations and the governance requirements of being a public firm require adaptations of the firm's internal organization, and that going public is associated with the firm entering a new phase in its life cycle. Following this argument, Babina, Ouimet, and Zarutskie (2025) show that the turnover of the labor force is large: even though net employment is growing, employees' departure rate is significantly higher than the departure rate at comparable public firms. Interestingly, many departing employees leave for start-up firms after the IPO, especially in high-tech sectors, which may be interpreted as a match between the human capital of these employees and the requirements of start-up firms, which change after these firms go public (see also Babina, Ma, Ouimet, et al., 2018). Moreover, post-IPO firms pay a wage premium to new hires but not to existing employees, suggesting that firms face an upward-sloping supply curve as they try to expand their operations rapidly. (See Section 4.2 for the related argument on start-ups.) Finally, the average wage paid after the IPO declines significantly from $83,000 to $57,000 relative to the existing workforce. This may indicate that firms go public at the point at which they move from exploring new technologies, which requires high-skilled employees, to commercialization, which requires more production workers. (See Borisov, Ellul, and Sevilir, 2021 for a discussion of this idea.)

Bias, Lochner, Obernberger, et al. (2025) investigate how firms adapt their organizational structure before and after the IPO for a sample of German firms, which allows them to draw on German census data that permit an accurate mapping of the hierarchical structure of the firm and its organizational functions (e.g., production, administration, and managers). They find that IPO firms formalize their internal organization by adding layers, hiring more managers, reducing control spans, and establishing larger administrative functions. They also find a large increase in employee turnover. Their results mirror earlier findings that public firms are more formalized and bureaucratic, a potential reason for the large departure rate of some employees, such as innovators (Bernstein, 2015). Moreover, they show that some of the changes they document already begin in the years before the IPO as firms prepare their organization for becoming a public firm. Finally, Silva, Baghai, and Soares (2025) study the impact of IPOs on workers in Sweden, using withdrawn IPOs as a counterfactual to support causal conclusions (Bernstein, 2015). They show that public firms offer 10% to 19% higher compensation and also greater wage stability to their workers. Their conclusions are consistent with the notion that

employees of private firms accept deferred compensation payments in exchange for the promise to receive higher wages later (see Section 3.3), and firms deliver on these promises after the IPO.

Given that the scale and composition of the workforce both change around IPOs, it is interesting to note that the governance structure and the investor base of firms, both of which used to be tightly associated with reaching the IPO stage, are increasingly dissociated from it as firms remain private longer. Davydova, Fahlenbrach, Sanz, et al. (2024) show that the shift from venture-capital funding to funding through other institutional investors is associated with companies achieving unicorn status through private funding, and that investors also provide liquidity to founders and employees in private firms. Relatedly, Lowry (2024) shows that private firms increasingly grow inorganically through acquisitions, making the increase in acquisition activity post-IPO much less pronounced than before. Finally, Ewens and Malenko (2024) show how the boards of start-ups, and specifically the role of independent directors on these boards, change over the life cycle of the firm. Hence, large private firms tend to display characteristics that used to be associated with public firms, which implies that these characteristics are associated with the expansion phase and not with the status of being public.

Overall, a coherent but still incomplete picture emerges from the still-growing literature on the timing and impact of IPOs on firms and their employees. There seems to be a broad consensus that the increased availability of private equity has reduced the benefits of a public listing, while the costs of being public have increased for those firms that rely more strongly on human capital and organizational capital, which has led to an upward shift in the size and age of firms that go public. Consequently, the population of firms that go public has become more heterogeneous: while for some, the public-private trade-off has only moved a little and they still go public at an early stage of their life cycle, probably with the beginning of the expansion or commercialization stage, the public-private trade-off has moved significantly for other firms, especially those that put a higher weight on protecting the decision-making autonomy of their founders and their intangible capital. While these more mature private firms adapt to some extent to their public counterparts by having a similar investor base, board structure, and acquisition strategy, they refrain from exposing themselves to the limelight of a public listing. The argument in this section suggests that they have not quite completed their exploration stage and are thus not willing to pay the price involved in moving to the exploitation stage, in losing their innovative dynamism (Bernstein, 2015), and in standardizing their organization in the sense of Rajan (2012).

Two changes may be useful to improve future research in this area and complete this rather complex picture. First, it seems advisable to recognize the heterogeneity of firms that go public and to build on the example of Kenney, Patton, and Ritter (2012), who separate younger, faster-growing IPO firms (their “Emerging Growth Companies”) from the more mature IPO firms. Second, given that the

heterogeneity stems from the differences in which firms weigh the costs and benefits of going public, it may be fruitful to explicitly analyze the endogenous choice to go public rather than removing the endogeneity with instrumental variables.

4.4 Private equity

Providing a coherent account of private equity transactions and locating them in the firm's life cycle is challenging since private equity investors may play very different roles at different stages of the firm's development. The previous section on the decision to go public already introduces growth equity, a form of private equity that provides funds for young and growing firms during the expansion phase. Growth equity may be regarded as an extension of venture capital to the expansion phase of the firm. Growth equity is thus a substitute for going public and is associated with an early stage of the firm's life cycle. By contrast, private equity investments in more mature firms reverse the decision to go public, e.g., to address frictions that require the intervention of concentrated owners. This step to go private may only be temporary when private equity firms take their targets public again in reverse buyouts (Muscarella and Vetsuypens, 1989; Degeorge and Zeckhauser, 1993). Unfortunately, empirical studies often do not distinguish transactions based on firms' life cycles, and categorizing private equity targets into growing and mature firms is not necessarily congruent with classifying them into private-to-private and public-to-private transactions. To address this issue, this survey first discusses the literature on aggregate employment and wages, which is predominantly older and builds mostly on samples before the advent of growth equity. As such, it is not hampered by the concern that some targets may be young and growing firms. The subsequent discussion then groups studies by three constraints to which firms may be subject, and which create three corresponding margins of improvement for private equity: implementation of new technologies, financial constraints, and the implementation of state-of-the-art management practices. The last part of this section addresses the argument that private equity transactions may not create any value at all and may simply transfer wealth from other stakeholders to shareholders.

The impact of private equity buyouts on employment and wages is heterogeneous.

There is an established literature that investigates the impact of private equity buyouts on employment and wages. Effects on employees in this literature are usually attributed to operational improvements, increases in leverage, and governance reengineering. Since multiple surveys on this literature exist, it suffices to summarize the main contributions in the following table, which also includes more recent studies not covered in prior surveys.[20] Employment and wage effects are

[20] There are multiple surveys on leveraged buyouts and private equity that cover the impact of private equity on employees in one of their sections: Cumming, Siegel, and Wright (2007); Kaplan and Strömberg (2009); Wright, Gilligan, and Amess (2009); Eckbo and Thorburn (2013) (their Section 8.4.2); Renneboog and Vansteenkiste

reported for the period from the buyout to the second year after the buyout if reported in the study, or the nearest approximation to that value; hence, the table only allows for qualitative comparisons as the numbers are not fully comparable across studies.

The variation of results across studies is large, with estimates of the impact of buyouts on employment ranging from a negative 61% to a positive 12%. The impact of buyouts is estimated to be negative in ten out of fourteen studies, although the estimated effects are not large in absolute value except for two UK studies that find evidence of large downsizing after buyouts. Some of this heterogeneity may be accounted for by differences in methodology. However, the main conclusion from this table is probably that private equity buyouts are a multi-faceted category of transactions that do not admit as simple a label as "harmful" or "not harmful" to employees. Hence, it seems more fruitful to identify the margins of improvement on which buyouts operate, which are covered in the next three sections.

Table 3: Private Equity buyouts and employees. The table lists studies on how private equity buyouts affect the employment levels and wages of targets. The column "Type" describes the sample as LBOs (leveraged buyouts), reverse LBOs, MBOs (management buyouts), or PE (private equity buyouts), depending on how the authors of the study describe their sample. If available, the table reports the effect from the buyout year to the second year after the buyout; if this number is not reported in the study, the nearest approximation reported in the study is taken, often the entire pre-to-post buyout change. The "Level" of the study is either firms, establishments, or individuals and refers to the most granular level covered in the study.

	Results		**Sample**			**Type**
Study	**Employm.**	**Wages**	**Obs.**	**Period**	**Country**	**Level**
Kaplan (1989)	+0.9% (Or: 4.9%)	-	76	1980-1986	US	MBOs firms
Lichtenberg and Siegel (1990b)[21]	-2.0%	+3.6%	131	1981-1986	US	LBOs, MBOs establishments
Muscarella and Vetsuypens (1990)	-0.6% (Or:+17.0%)	-	72	1983-1987	US	Reverse LBOs firms
Smith (1990)	-2.0%	-	58	1977-1986	US	MBOs firms
Liebeskind, Margarethe, and Hansen (1992)[22]	-6.1%	-	33	1980-1984	US	LBOs firms

(2017) (their Section 3.2.2); Olsson and Tåg (2025a). Cumming, Siegel, and Wright (2007) provide similar survey tables on other dimensions in which private equity affects firms' policies.

[21] Numbers refer to production workers. See their Table 6.

[22] Calculated as the change in the decline in the number of employees in manufacturing (Exhibit 2) divided by the mean number of employees before the LBO (Exhibit 1).

	Results		Sample			Type
Study	**Employm.**	**Wages**	**Obs.**	**Period**	**Country**	**Level**
Harris, Siegel, and Wright (2005)[23]	-61%	-	35,752	1994-1998	UK	MBOs establishments
Amess and Wright (2007)	-1%	-3%	1,350	1999-2004	UK	LBOs firms
Cressy, Munari, and Malipiero (2008)[24]	-18.0%	-	57	1995-2002	UK	LBOs firms
Boucly, Sraer, and Thesmar (2011)	+12.0%	-	839	1994-2004	France	LBOs firms
Chung (2011)[25]	+21.0	-	4,652	1998-2008	UK	LBOs firms
Davis, Haltiwanger, Handley, et al. (2014)[26]	+0.88%	-	3,218	1980-2005	US	PE buyouts
Goergen, O'Sullivan, and Wood (2014)[27]	-2.2%	insign.	106	19979-2006	UK	PE buyouts firms
Antoni, Maug, and Obernberger (2019)	-2.0%	insign.	511	2002-2008	Germany	PE buyouts establishments
García-Gómez, Maug, and Obernberger (2025)	-1.9%	insign.	274	2007-2013	Nether-lands	PE buyouts establishments

Private equity buyouts may relieve financial constraints

Only two papers address how private equity buyouts address financial constraints. Boucly, Sraer, and Thesmar (2011) study a sample of 839 French LBOs between 1994 and 2004 and find a large average employment increase of 12% relative to comparable control firms, accompanied by increases in sales, capital expenditures, and profitability. Moreover, strong post-buyout growth is concentrated in private-to-private transactions and in industries that rely more strongly on external capital, consistent with the interpretation that buyout targets grow because they are financially more constrained. Boucly, Sraer, and Thesmar (2011) motivate their study by pointing out that France does not have fully-developed equity markets like the US or the UK, which may provide a stronger role for private equity

[23] The ratio of post-MBO to pre-MBO plant-level employment in their Table 4 is 39.0%.

[24] Their Table 5, column 1, coefficient on PE.

[25] Unadjusted percentage change from the year before to the year after the buyout.

[26] Firm-level employment growth for the buyout and two post-buyout years. from their Table 4, column. Estimates from establishment-level regressions are comparable (their Table 3).

[27] The sample is restricted to institutional buyouts. The reported number for employment decline cumulates the effects of the buyout year and two subsequent years ("Year 1," "Year 2," and "Year 3" in their Table 2, Panel A).

finance as a substitute for access to public markets. Hence, it is instructive to compare their results to those of Chung (2011), who conducts a similar exercise for a sample of 1,009 buyouts in the UK between 1997 and 2006. Interestingly, his results for private targets are similar to those of Boucly, Sraer, and Thesmar (2011), but stronger in magnitude: In the UK sample, employment at private targets grows by 37% more from the year before to three years after the buyout compared to a control sample. He also finds increases in sales and capital expenditures for private targets, as well as declines for public targets. This finding suggests that the private targets are in an earlier stage of their life cycle, whereas public targets are more mature, and emphasizes the importance of distinguishing targets of private equity buyouts by their life-cycle stages. Finally, Chung (2011) collects data on deal rationales for a subsample of his study and finds that 70% of the firms that provide information intend to expand through capital investments, acquisitions, or geographical expansion. Hence, Chung's results suggest that the private equity funding of growing firms has an important role even in the context of a well-developed public equity market, consistent with the notion that remaining private has specific advantages. The two studies summarized in this paragraph, together with the discussion of growth equity in the previous section, lead to the conclusion that private equity has become a valuable alternative to public markets for overcoming financial constraints.

Private equity buyouts can improve management and management practices.

An emerging literature on private equity buyouts asks how private equity firms affect the management practices of target firms. While the earlier literature recognizes that buyouts lead to operational improvements through changes in governance and management incentives, these more recent contributions investigate the transmission channels through which buyouts achieve their goals, specifically, changes in operational practices and management deeper down in the organization. Bloom, Sadun, and Van Reenen (2009); (2015) gather data on management practices from interviews at 15,000 firms in 34 countries on management practices, and classify 465 of these firms as owned by private equity.[28] Firms are ranked on 18 management practices on a scale from 1 (worst) to 5 (best) based on criteria from a management-consulting firm, which are then validated through regression analysis by relating them to total factor productivity. (See Bloom and Van Reenen, 2007 for details on the management survey.) The main findings are that firms owned by private equity have better management practices than those firms with other owners, that the higher averages result from a thinner left tail, and that private-equity-owned firms have stronger people-management practices: more merit-based hiring, firing, compensation, and promotion practices. Since the analysis is not based on a panel, it is only descriptive and cannot separate causal effects from selection effects, but it

[28] The discussion here builds on the more detailed working-paper version (Bloom, Sadun, and Van Reenen, 2009) rather than the more condensed published version (Bloom, Sadun, and Van Reenen, 2015).

suggests that operational improvements are associated with the human resource management of private equity firms. This interpretation is corroborated by the findings of Cohn, Nestoriak, and Wardlaw (2021), who document improvements in workplace safety after private-equity buyouts. Based on interviews, they attribute these improvements, among other things, to improvements in monitoring.

Two other papers provide stronger causal evidence for smaller samples. Bernstein and Sheen (2016) study 118 restaurant chains acquired by private equity investors in Florida and provide causal evidence by comparing chain-owned with franchised restaurants. While owners of the chain have full control of the former, they control the latter only through contracts without exercising residual control rights. Hence, this construction of the control group holds factors unrelated to ownership constant. The paper finds markedly reduced levels of health violations in directly-owned restaurants, which is not achieved by increasing employment. Cohn, Nestoriak, and Wardlaw (2021) link a sample of about 500 establishments of US private equity targets to records of workplace safety and show that annual injuries per employee and citations for violations after safety inspections both decline after buyouts relative to a matched sample. The decline is stronger in firms with high levels of variables that measure short-termism (abnormal accruals, analyst coverage, holdings by high-turnover institutional shareholders), which suggests that buyouts reduce short-termism. In addition, the paper provides interview evidence with executives of the buyout firms who attributed these declines to operational improvements, specifically to increased monitoring throughout the organization. Hence, together, these studies create a picture in which private equity firms implement stronger monitoring in their targets, which leads to operational improvements that also benefit workers, as in the case of reduced workplace injuries.

Some recent studies investigate other consequences of buyouts for employees. García-Gómez, Maug, and Obernberger (2025) analyze a sample of more than 50,000 buyout employees in the Netherlands with data on their health records and find no impact of buyouts on employees' intake of stress-related medications or other aspects of their health. However, they find evidence for an effect in the opposite direction: employees who were less healthy before the buyout are more likely to lose their jobs, which the authors attribute to the fact that poor health impairs workers' productivity. Hence, their findings are consistent with the notion that private equity firms implement more productivity-oriented human resource policies. Two studies utilize employees' subjective assessments of their job satisfaction based on Glassdoor ratings and reviews (Lambert, Moreno, Phalippou, et al., 2021; Gornall, Gredil, Howell, et al., 2024) and both find that job quality declines after buyouts, especially in public-to-private transactions (Lambert, Moreno, Phalippou, et al., 2021). Together, these studies suggest that at least some of the correlation of stronger people management and ownership by private equity firms in

Bloom, Sadun, and Van Reenen (2015) comes from a causal relation: changing human resource management is one of the channels through which private equity firms affect productivity, potentially at the cost of lower job satisfaction for employees.

Do private equity buyouts transfer wealth from other stakeholders?

Private-equity buyouts are often criticized in public for generating positive returns to shareholders through wealth transfers at the expense of other stakeholders, particularly employees, and thus for a "breach of trust" by breaking implicit contracts. In fact, many of the papers reviewed in this section motivate their study by the public interest in the subject and cite political commentators from several countries who express negative assessments of private equity buyouts, especially regarding their treatment of employees.[29] By contrast, there is a consensus in the academic literature surveyed here that employment declines by themselves do not constitute evidence for a breach of trust if they are accompanied by productivity improvements and thus indicate wealth creation (e.g., Kaplan and Strömberg, 2009; Olsson and Tåg, 2017). However, Olsson and Tåg (2017) argue that transfers of value may exist alongside value creation and that the test to separate the two is the development of the employment and wages of employees after buyouts. They find little evidence for a general impairment of employees' human capital after buyouts, except for the subgroup with skills that become obsolete through offshoring and routinization. Antoni, Maug, and Obernberger (2019) point out that the "breach of trust" mechanism identified by Shleifer and Summers (1988) involves the new owners taking advantage of the lock-in of workers who made investments in firm-specific human capital by forcing them to accept lower wages; they find no evidence for this implication. Herkenhoff, Lerner, Phillips, et al. (2025) also conclude that their analysis rejects the breach-of-trust argument. There is a remarkable gap between public perceptions and the academic findings on private equity.

Summary

The academic literature on private equity buyouts and their consequences for other stakeholders, particularly employees, is unusually large, in all likelihood because of the public interest in the subject. However, whereas public perceptions are generally critical, the overall assessment that emerges from the research literature is more nuanced. Private equity buyouts address many aspects of firms' policies, all of which affect employees, and some effects are indeed negative, e.g., when a process of creative destruction leads to higher turnover of the workforce, and laid-off employees cannot find new jobs.

[29] For example, Lambert, Moreno, Phalippou, et al. (2021) report how Susan Faludi won the Pulitzer Prize in 1991 for her reports on employees' suicides after the Safeway LBO and how related concerns motivated Senator Elisabeth Warren to propose the "Stop Wall Street Looting Act." Davis, Haltiwanger, Handley, et al. (2014) cite similar views of the former Danish Prime Minister Poul Rasmussen. Antoni, Maug, and Obernberger (2019) summarize the debate in Germany in which private equity firms were branded as "locusts."

However, other effects are positive, for example, when private equity firms facilitate job creation or allow employees to acquire new skills related to information technologies.

While the picture painted by the contributions to this area of research is already rich, new insights may still emerge from identifying more clearly at which stage in the firm's life cycle private equity buyouts happen and on which margin of improvement they operate. In all likelihood, private, younger, and expanding firms benefit more from relaxing financial constraints, whereas more mature public firms benefit more from improvements in technologies and management practices.

4.5 M&As and takeovers

While notions such as "synergies" and "operational improvements" are part of the stock phrases to explain gains from corporate reorganization, a detailed understanding of the associated processes and the role of the firm's workforce in them is only just emerging. Several recent studies observe that the ability to reorganize the workforce is key to successful restructuring and the creation of shareholder value after acquisitions. John, Knyazeva, and Knyazeva (2015) analyze returns to acquisition announcements for deals between 1985 and 2009 and, as their measure of employee rights, use state-level variation in right-to-work laws, which limit the bargaining power of unions (see the discussion of Matsa, 2010 in Section 3.4). They find that returns to acquirers and combined returns to bidders and targets are significantly lower for deals with acquirers from strong labor-rights states, and the effect is stronger in labor-intensive industries.[30] Dessaint, Golubov, and Volpin (2017) and Levine, Lin, and Shen (2020) both exploit cross-country differences in labor protection in large international samples. Dessaint, Golubov, and Volpin (2017) use 21 labor market reforms in the OECD and find that the number of takeovers drops by 15% and deal volume drops by 30% in response to significant increases in employment protection. The combined stock return to deal announcements falls by two percentage points, and offer premiums fall by about one-third in response to the same legal shock. The authors estimate that labor force restructuring accounts for between 50% and 80% of stock market assessments of takeovers. Levine, Lin, and Shen (2020) address similar questions for a sample of 13,000 cross-border acquisitions and use different measures of labor protection, which allows them to extend their sample beyond the OECD to a total of 50 countries. They confirm the findings of Dessaint, Golubov, and Volpin (2017). In addition, they show that the effects of labor protection are stronger in

[30] How to interpret event-study results in M&A research is currently undergoing a debate. While much of the earlier literature took for granted that abnormal returns can be attributed to synergies and their division between acquirers and targets (see Betton, Eckbo, and Thorburn, 2008 and Eckbo, Malenko, and Thorburn, 2025 for reviews), recent contributions emphasize the importance of the revaluation of the stand-alone values of bidders and targets (Wang, 2018; Ben-David, Bhattacharya , Huang, et al., 2025). This survey adopts the conventional interpretation of event studies and disregards confounding anticipation and revaluation effects.

labor-intensive industries and that acquirers tend to purchase labor-intensive targets in weak-labor-regulation countries.

Results on the role of unions in the creation of synergies are more nuanced. On the one hand, organized labor may increase the frictions in post-merger restructuring in similar ways to employment protection and thus impede M&As and synergy creation. Tian and Wang (2021) investigate this hypothesis by using a regression discontinuity design on union elections in the US and find that firms with election outcomes barely above the acceptance threshold receive only about half of the number of takeover bids within three years after the election compared to those firms barely below the threshold. Moreover, conditional on receiving a bid, the former group also has lower takeover premiums. By contrast, Ahmad and Lambert (2019) study how the union density and bargaining coverage of unions affect M&A activity and synergies in 46 countries and find that the frequency and volume of M&As as well as combined-firm announcement returns, increase substantially with union density. However, this study confirms the negative impact of employment protection legislation on M&A volume and announcement returns and suggests that the union effect and the legislation effect are of comparable size. This observation may also indicate why the two studies find different results: In the presence of restrictive employment protection legislation, the ability to negotiate a deal with a union may be beneficial for M&As, an effect that cannot be observed in the US, which receives low scores on employment protection legislation from the OECD. However, the precise mechanisms through which employment protection legislation and collective bargaining interact have not yet been investigated. The overall conclusion from these studies is that the ability to reorganize the labor force is key to the success and value creation of M&As and that restrictions on this ability reduce the profitability as well as the likelihood of M&As.

The systematic study of how M&As affect employees begins with Bhagat, Shleifer, and Vishny (1990), Lichtenberg and Siegel (1990a), and Rosett (1990), who investigate how wages and employment develop after mergers. These studies spawned many follow-up studies that investigate employment and wage effects, many of which are discussed below. The older literature is more comprehensively summarized in established surveys of the general literature on M&As.[31] The remaining part of this section analyzes the mechanisms through which M&As affect employment and wages. Section 4.5.1 discusses several labor-related channels through which M&As may create synergies. The subsequent Section 0 then focuses on how M&As affect employees.

[31] This is an established and long literature that is surveyed by Andrade, Mitchell, and Stafford (2001); Martynova and Renneboog (2006). (2008); Betton, Eckbo, and Thorburn (2008); Holmstrom and Kaplan (2001); and Harford (2024).

4.5.1 Labor-related sources of synergies and dyssynergies in M&As

The labor-related mechanisms through which firms achieve synergies in M&As can be categorized into four broad paradigms: (1) consolidation of operations and exploiting economies of scale; (2) leveraging organizational and technological capabilities; (3) exploiting complementarities in the skills of acquirers and targets; and (4) acquiring the labor force of the target to overcome skill shortages. As these four paradigms sometimes overlap, some studies are cited multiple times.

Synergies from consolidation and exploiting economies of scale

Firms may be able to achieve economies of scale if they can consolidate the operations of two or more firms in one organization, thereby eliminating overlaps. Since it is the similarity of operations that is critical for such redundancies to exist, studies in this literature have developed several measures based on the similarities of the workforces of the merging firms. An early study in this literature is Neffke and Henning (2013), who develop a measure of skill-relatedness from cross-industry labor flows for skilled workers. They show that their measure of skill-relatedness predicts the occurrence of mergers and has incremental explanatory power relative to other measures of firms' similarities, e.g., of firms' product markets or technologies. Lee, Mauer, and Xu (2018) construct a cosine-similarity measure of skill-relatedness based on the occupational profiles of industries in which firms operate and also find that their measure predicts mergers and is not subsumed by measures related to product markets. In addition, they investigate how skill-relatedness affects synergies and report that a one-standard-deviation increase in their measure of skill-relatedness increases the combined firms' announcement returns on average by 42%. Moreover, firms' employee-related expenses decline significantly with skill-relatedness, especially when product-market relatedness is low. Lagaras (2021) uses a similar approach to a sample of merging firms in Brazil. Instead of industry-level occupational profiles, he uses firm-level profiles for measuring skill-relatedness and data that distinguish voluntary from involuntary separations. The analysis confirms the high association between skill-relatedness and the incidence of mergers. In addition, the likelihood of involuntary separations increases by 33% for firms with high levels of skill-relatedness. Dobbelaere, McCormack, Prinz, et al. (2022) show for a sample of M&As in the Netherlands that firms reduce the employment of target workers by 8.5% and that workers are more likely to be separated if their skills are duplicated by those of the acquirer and if they are more highly paid. Overall, the contributions to this literature provide convincing evidence that the similarity in the workforces of firms predicts the likelihood of consolidating mergers and that the degree of occupational overlap is associated with synergies and reductions in the workforce.

Synergies from exploiting the complementarities of the workforce

The literature on M&As has long recognized that asset complementarities between firms may give rise to mergers (e.g., Rhodes-Kropf and Robinson, 2008). Tate and Yang (2023) hypothesize that M&As add

value by creating internal labor markets in which firms can rematch workers to tasks between acquirers and targets, and that rematching is easier if the workers from one firm are more similar to those of the other firm. They proxy for this similarity with a measure of the transferability of human capital between the industries of merging firms in diversifying acquisitions, which they define as the frequency of between-industry job changers relative to the total number of job changers. Consistent with their hypothesis, they find that diversifying mergers between industry pairs characterized by higher human capital transferability are more frequent and associated with higher cumulative abnormal stock returns. Furthermore, the transferability of high-skilled workers seems to be more important, and the effects are strongest for acquirers from states that enforce non-compete agreements, consistent with the notion that internal transfers substitute for external hires. Bai, Bereskin, Officer, et al. (2025) develop a dynamic perspective of this question by examining the extent to which not only the similarity of skills but also changes in the similarity of skills predict mergers, building on the hypothesis that when firms change the direction of their growth strategy, they first develop their labor force to support this direction and then buy complementing target firms. They find that firms are more likely to merge after a convergence in their skill demand, as measured by job postings, which supports the claimed mechanism in which organic growth precedes external growth.

Whereas Tate and Yang (2023) ask into which sectors firms diversify when they acquire other firms, Beaumont, Hebert, and Lyonnet (2025) ask the closely-related question of whether firms enter a new sector by acquiring other firms or by expanding their existing business, i.e., whether they "build" or "buy" when they diversify. They hypothesize that firms enter new sectors by acquiring other firms if the new sector requires different skills from those of the firm's current employees. The authors use a data set of 61,000 entries into new sectors in France between 2003 and 2014, and use a cosine-similarity measure of human-capital relatedness between firms and sectors into which they diversify. Their key result is that firms are more likely to buy rather than build if they diversify into a new sector that requires skills more dissimilar from those of the firm's current employees: a one-standard-deviation increase in human capital distance is associated with a 20% increase in the probability of buying, and instrumental variable regressions suggest that this association admits a causal interpretation. Moreover, this effect is concentrated in firms with a lower level of organizational capital. These findings provide a potential mechanism for the claim that negative cumulative abnormal returns to acquirers mainly reflect a revaluation of the acquirer's standalone value: the acquisition may reveal to investors that acquirers lack growth options and cannot develop their product portfolio organically (e.g., Wang, 2018).

Li, Qiu, and Shen (2018) analyze the closely-related hypothesis that deal performance in M&As depends critically on firms' organizational capital, which derives from information firms accumulate

through their management systems and processes as part of the production process. Li, Qiu, and Shen (2018) follow prior literature (e.g., Eisfeldt and Papanikolaou, 2013) and proxy firms' organizational capital by constructing a measure of capitalized SG&A expenses. Their key finding is that firms with a one-standard-deviation higher stock of organizational capital experience about two percentage points higher three-year buy-and-hold abnormal stock returns and about six percentage points higher returns on assets after mergers. Hence, information about the suitable assignment and training of employees seems to be critical to successful post-merger restructuring, potentially because it allows firms to operate internal labor markets more effectively.

Bena and Li (2014) and Li and Wang (2023) both analyze how complementarities arising from companies' inventors influence the incidence of M&As and the quality and quantity of firms' innovations. Bena and Li (2014) show that mergers are more likely between firms if their patent portfolios overlap and that firms with high R&D expenses but slow growth in patent output are likely to become targets, whereas those with low R&D expenses and large patent portfolios become acquirers, which indicates the importance of complementarities of innovative activities between merging partners for the creation of synergies. It also suggests that acquirers and targets are at different stages of their respective life cycles. Li and Wang (2023) investigate the mechanisms through which these synergies are created by showing that mergers increase the collaboration between target inventors and acquirer inventors post-merger, that these collaborations are more likely if inventors share the same core expertise, and that these collaborations substantially increase the value and impact of the patents relative to a counterfactual. Wang (2025) also documents productivity improvements of inventors after M&As and finds that they are concentrated in mergers with more technological overlap, measured by the cosine similarity of technology classes, which is consistent with the notion that M&As exploit technological complementarities. The findings of these studies complement those of Smeets, Ierulli, and Gibbs (2016), who study a sample of Danish M&As in the 1980s and 1990s. They show that the degree of post-merger integration, measured by the extent to which employees of one firm collaborate with those from the other firm post-merger, is generally low and suggest that firms integrate by concentrating collaborative relationships in a small number of key employees, in particular, high-skilled employees and managers.

Finally, Gehrke, Maug, Obernberger, et al. (2025) show that the skills of the managerial employees of acquirers and targets are complementary: Firms close target establishments and transfer their operations to the establishments of the acquirer in about one-third of the transactions in their sample of German M&As. While firms retain only a few of the operational employees of the target, they retain a significant proportion of their managers, who then displace some of the acquirer's management. Conversely, if firms continue to operate the establishments of the target, they do the opposite and

replace target managers with those of the acquirer or new hires. Hence, firms always combine the operational knowledge of the target managers with the managerial skills and processes of the acquirer managers, which indicates that both sets of skills are complementary. Overall, papers in this literature show that complementarities in M&As may not only derive from physical assets but also from intangible assets and, specifically, from the complementary skills in acquirers' and targets' workforce.

Synergies from improving technological and organizational capabilities

Several studies investigate the hypothesis that M&As foster technological change. However, in addition to the channel through reducing agency costs emphasized above for private equity buyouts (the agency channel), M&As may also help firms improve technologies by transferring them between acquirers and targets (the transfer-of-technologies channel, which may operate in both directions). In his study of Brazilian M&As, Lagaras (2021) shows that these transactions shift the composition of the labor force toward highly-skilled employees and, specifically, employees with knowledge-intensive and innovation-intensive occupations. His results are thus consistent with the hypotheses that mergers implement routine-biased technological change, in which workers with easily-codifiable tasks are replaced through automation, and skill-biased technological change, in which labor shares are tilted away from jobs that are substituted by technology and toward jobs with skill requirements that are complementary to technology. Ma, Ouimet, and Simintzi (2025) analyze a US sample of the target establishments involved in horizontal mergers and find that mergers implement routine-based technological change and skill-biased technological change. The paper asks through which channel M&As affect technological change and finds only weak evidence for the agency channel, whereas there is more consistent evidence to support the transfer-of-technology channel: more IT-intensive acquirers induce more automation at the target. These changes in technology are associated with changes in wages: post-merger, average wages increase, but the dispersion of wages increases as well, consistent with earlier findings that technological change fosters wage inequality.

Gardberg, Heyman, and Tåg (2023) study the wages of employees for a sample of foreign acquisitions of Swedish targets. They show that wages remain unaffected by acquisitions but decline for workers in software-exposed occupations. In particular, workers in these occupations who stay with their firm and whose employers are bought by software-intensive acquirers lose almost 15% over eight years. Similarly, workers in occupations with robot exposure who stay and are acquired by robot-intensive firms lose 12% over the same period. These results on wages complement those on employment in other studies and support the hypothesis that acquirers foster skill-biased and routine-biased technological change. Interestingly, the patterns reverse for exposure to artificial intelligence (AI): Workers exposed to AI see their wages increase by 3.5%. This effect is puzzling but may be explained by the opposite impact different technologies have on the internal organization and the internal

allocation of tasks of the firm (Bloom, Garicano, Sadun, et al., 2014): While improved communication technologies shift tasks to the top of the organization and disempower employees in the middle, thereby reducing their productivity and wages, investments in information technology like expert systems (which would include AI) have the opposite impact: they facilitate delegation and increase the productivity and wages in the middle of the organization (see also the discussion of job polarization in Section 4.4). Future work will likely explore the impact of AI and whether it automates tasks and substitutes for and displaces labor, or whether AI is complementary to human capital and increases labor demand through creating new tasks ("new work" in the sense of Autor, Chin, Salomons, et al., 2024). The preliminary evidence available so far indicates that the latter may dominate and that AI tends to empower employees in the middle of the organization, thereby reversing job polarization and flattening hierarchies (Ewens and Giroud, 2025) and increasing the labor income share (Zhang, Ye, and Meng, 2025).

Overall, there is strong support for the notion that M&As foster technological change. However, the effects are heterogeneous across workers and firms, as different acquirers foster different types of technological change, and the impact on employees depends on whether new technologies substitute for or complement their skills.

Acqui-hiring as a motivation for M&As

One potential source of employee-related synergies in M&As analyzed in a number of studies is the acquisition of scarce talent through the acquisition of firms – often start-ups – with skilled employees ("acqui-hiring").[32] The idea is that access to employees with scarce skills limits firm growth, especially for firms in knowledge-intensive industries, and that they overcome this limitation by acquiring targets mainly for their workforce. It is not entirely obvious why firms would prefer to acquire the entire firm rather than poaching individual employees or entire teams, given that acqui-hiring also involves paying a premium to the shareholders of the firm. Based on a survey of entrepreneurs in Silicon Valley, Polsky and Coyle (2013) argue that a combination of reputational and tax concerns, buttressed by the threat of informal social sanctions, makes entrepreneurs prefer selling to a larger firm rather than just leaving the start-up.

Showing that firms acqui-hire and use acquisitions as a substitute for direct hiring or for poaching individual employees from other firms is methodologically challenging, since acquirers purchase not only the employment relationships of the firm but also assets that are complementary to human capital, such as technological knowledge and incomplete R&D projects. For example, the

[32] The term "acq-hire" can be traced to a blog post on *Business Insider*, "Recruiting, the most important thing in Silicon Valley," published in 2005.

characteristics of the workforce may proxy for the characteristics of the technology, and it may be difficult to disentangle whether acquirers seek the workforce or the technology. An important complementary asset is organizational capital: As Chen, Hshieh, and Zhang (2024) and others emphasize, acquirers obtain an entire team with an existing track record of successful collaboration and not just individual workers. Teams have a value in addition to the combined value of the human capital of the individual employees (Jaravel, Petkova, and Bell, 2018). As such, team collaboration forms a component of organizational capital, which acquirers purchase in a bundle with the human capital of the individual employees. (See Groysberg, Lee, and Nanda, 2008 on this point, who provide evidence for the role of firm capabilities and teams for financial analysts.) Some but not all contributions to this literature disentangle the potential confounding effect from acqui-hiring employees and acquiring complementary assets associated with these employees.

Ouimet and Zarutskie (2020) investigate the acqui-hiring hypothesis and identify targets with a highly-skilled workforce through textual analysis of their annual reports. They find that post-merger employment growth is higher in those transactions in which the target mentioned the skills of its workforce more frequently in its annual reports before the merger. Moreover, high-wage workers are more likely to be retained and receive higher wages after mergers, and these effects are strongest in states that enforce non-compete agreements. Chen, Hshieh, and Zhang (2024) explore the same hypothesis and use firms' success in lotteries for work visas as a source of identification. (See their related work on start-ups in Section 4.2 for further details.) It turns out that a one-standard-deviation increase in a firm's lottery win rate increases its number of acquisitions by 4.4% and the number of acqui-hired workers with a work visa by 6.6%, which suggests that acquiring firms that were successful in hiring foreign workers is a substitute for hiring these workers directly. These effects are stronger in tight labor markets, in states that enforce non-compete agreements, and for firms with a highly-skilled and highly-paid workforce, which provides further evidence for the acqui-hiring hypothesis. They investigate the hypothesis that firms attempt to buy not the employment relationships but the patents of the target, but find no evidence to support this hypothesis from separate analyses of targets with and without patents. (See, however, the complementary evidence in Bena and Li, 2014 discussed in the previous subsection, which suggests that firms are more likely to become targets if they have more incomplete R&D projects.)

Two papers use the costs of losing employees post-merger as a source of identification. Younge, Tong, and Fleming (2015) use a legal reform in Michigan in which legislators – probably inadvertently – repealed a law that prevented the enforcement of non-compete agreements and unexpectedly granted Michigan employers the right to prevent employees from leaving. The reform thus increased the ability of these firms' acquirers to retain their employees. The paper finds that Michigan firms were

more likely to become acquisition targets after the reform. Similarly, Chen, Gao, and Ma (2021) use staggered reforms in the enforcement of non-compete agreements as a source of exogenous variation in labor mobility and show that targets in states that enforce these agreements are 0.8 percentage points more likely to be acquired relative to those states that do not enforce non-compete agreements. These effects are stronger for firms with more human capital and more mobile employees. They also show that firms in states that enforce non-compete agreements retain more inventors and managers, experience higher announcement returns, enjoy better stock and operating performance, and tend to have more collaboration between acquirer and target employees post-merger. Overall, there is sound evidence for acqui-hiring and for the hypothesis that firms sometimes acquire targets predominantly for their workforce.

Dyssynergies when employees leave

While acqui-hiring has advantages over poaching (teams of) highly-skilled employees, as summarized by Polsky and Coyle (2013), one of the important downsides is that acquiring firms may be unable to retain the key employees of the target. Several studies document elevated levels of employee turnover of M&A targets around the event, with increases starting even before the completion of the transaction. J. D. Kim (2020) analyzes these costs and reports several findings. While 12% of the regularly-hired employees of the acquirer leave within one year, the same rate is 34% for acqui-hired employees, indicating that acqui-hired employees who did not choose to work for the acquirer are significantly less likely to be retained after the acquisition. Moreover, this effect is significantly stronger for high earners and for employees with a high score for *organizational mismatch*, which is constructed based on their peers' prior employment history (see also Zhang, Zhong, and Yang, 2023 for further evidence on the relevance of organizational fit for the retention of employees after M&As). However, serial acquirers learn how to manage this friction over time and become more successful in retaining target employees.

Agrawal and Tambe (2019) analyze data from a job-search platform and show that target employees increase the rate at which they upload resumes by 5% to 11% relative to employees from control firms, with increased activity starting up to 10 months before the event; most of the job-search activity is concentrated in managerial employees. The authors interpret their findings in the context of a standard job-search model in which changes in search behavior are attributed to changes in expected future wages. Andres, Bazhutov, Cumming, et al. (2025) analyze a sample of about 10,000 takeover rumors from the period 1997 to 2018 and show how takeover rumors that do not materialize affect labor productivity. The rumors do not materialize within at least two years and often originate from outside the firm, e.g, social media, without any relation to events of the firm. However, they lead to a temporary drop in labor productivity of about 1.5%, measured by the ratio of sales to the number of

employees. The effect is stronger for firms headquartered in countries with weaker employment protection legislation. These results suggest that employees are temporarily distracted and fear job loss, which reduces their productivity until rumors subside. Taken together, these studies suggest that M&As, and even unfounded M&A announcements, can create dyssynergies by inducing employees to search for other jobs, by increasing employee turnover, and even by creating a temporary distraction.

Summary of synergies

Overall, the literature on M&As has documented four sources of labor-related synergies, which differ significantly across merger types:

- Consolidation, which achieves synergies from exploiting economies of scale, and leads to the reduction of duplicate jobs and operations.
- Combinations of complementary skills that generate synergies from a better matching of jobs to tasks or improved collaboration between target and acquirer employees. Leveraging these synergies depends critically on organizational capital.
- Technological change, which may take the form of transfers of technological capabilities from acquirers to targets as well as from targets to acquirers.
- Acqui-hiring, in which acquirers purchase the employment relationships of the target, potentially in combination with organizational capital embedded in target employees.

In addition, M&As, and even M&A announcements and rumors, can create dyssynergies by inducing employees to search for other jobs. The heterogeneity of the sources of synergies across merger types is associated with an equally wide range of outcomes for target employees. Whereas the elimination of duplicate jobs and operations, automation, and technological obsolescence negatively affect some employees, notably operational employees in the lower-to-middle range of the skill distribution, other employees benefit, particularly those with scarce skills and with skills complementary to new technologies.

Private equity buyouts may help foster technological change and creative destruction.

There is a consensus that private equity buyouts address agency problems in firms, and one agency problem may be that managers avoid making difficult and unpopular decisions, such as technological and organizational changes that are resisted by employees (Olsson and Tåg, 2017). Hence, firms may fall behind the efficient technological frontier, and the more concentrated ownership by private equity firms may help firms catch up with technological developments.

Davis, Haltiwanger, Handley, et al. (2014) study 150,000 establishments of 3,200 US targets of private equity buyouts between 1980 and 2005. They analyze the job creation and job destruction at multiple margins of adjustment: job creation and job destruction at establishments that continue to operate;

job losses at establishments that are closed; job creation at new, greenfield establishments; and acquisitions and divestitures. They find that employment declines by a little under one percent within two years of the buyout, summing up over all margins of adjustment combined. However, over the same period, wages at continuing establishments decline by 2.4%; job gains and losses amount to 14% of initial employment and exceed that of control establishments by 25%. Hence, while the net employment declines are marginal, the turnover of the labor force after buyouts is very large. Total factor productivity also increases, and the authors conclude that private equity buyouts improve operating performance by reallocating resources and catalyzing a process of creative destruction. Agrawal and Tambe (2016) analyze a data set of resume data gathered from a job-search platform and argue that PE investments have positive spillover effects on workers with IT-related skills. The mechanism is that private equity buyouts lead to technological improvements that provide more opportunities to learn on the job for such workers. Consistent with this argument, they find that employment spells are six to nine percent longer after buyouts and that the increase in employability is concentrated in employees who perform IT-related jobs, who take on average 1.3 years to acquire new skills in the buyout target, and these skills then increase their long-run employability.

Olsson and Tåg (2017) analyze buyouts in Sweden for a sample from 2002 to 2008 and find similar patterns for productivity growth and a negligible impact on the incidence of unemployment across all workers. In addition, they provide evidence for the hypothesis that private equity buyouts foster a process of job polarization, whereby the most negatively affected employees are those in the middle of the wage distribution, whereas the employment shares of those at the top and the bottom increase (Autor, Katz, and Kearney, 2006; Goos and Manning, 2007). Consistent with this hypothesis, they provide evidence for both mechanisms that underpin job polarization: the incidence of unemployment about doubles for low-productivity workers who perform routine jobs that are easy to replace by automation or who perform jobs that are easy to offshore to low-wage countries. They also find that private equity targets with below-average productivity increase their productivity and their investments in intangible assets (likely, investments in IT), which are complementary to offshoring and automation.

Antoni, Maug, and Obernberger (2019) shift the focus of the analysis from a discussion of net employment to the worker flows to and from buyout establishments, and show that buyout targets undergo a large turnover of their workforce. In a sample of 150,000 buyout employees of 511 German buyouts, the 2.0% decline (9.0% decline) in employment relative to a control group until the end of the second (fifth) post-buyout year is composed of a separation rate of 6.5% (18.8%) and a hiring rate of 4.5% (9.8%), hence on average, about 70% of the workers who leave the firm during the first two years are replaced by new hires. They find that human capital impairments are concentrated in three groups:

managers, white-collar workers, and older workers. However, buyout firms reduce the employment of white-collar workers, whose earnings losses are larger and who are replaced much less frequently, resulting in more than twice the employment decline of average employees. Hence, while firms appear to strengthen the higher layers of the organization and their administrative capabilities after IPOs (see Section 4.3), private equity buyouts seem to do exactly the reverse. By contrast, the losses of older workers are unrelated to the policies of buyout targets: they lose their jobs even less frequently than younger workers but find it disproportionately more difficult to find new employment. Antoni, Maug, and Obernberger (2019) find no evidence consistent with job polarization and reject the notion that private equity buyouts implement skill-biased technological change.

Finally, Herkenhoff, Lerner, Phillips, et al. (2025) investigate competing explanations for the impact of private equity investments on employees for a large sample of transactions in the US, which they match to individual workers. Their key results are that private equity leads to employment reductions in less productive establishments relative to more productive establishments, and that high-wage workers are reallocated to more productive establishments.

Overall, the recent literature converges on the view that the net employment changes associated with private equity buyouts are moderate or negligible. Rather, buyouts facilitate creative destruction through the simultaneous creation and destruction of jobs and establishments, and through the streamlining of organizations and the reallocation of workers. The findings on more specific skill-based explanations, such as job polarization, are generally more mixed, except that private equity firms appear to foster investments and job creation related to information technologies.

4.5.2 How do M&As affect employees?

The literature in the previous section sees the impact of M&As on employees as a side-effect of the creation of synergies. However, another strand of the literature argues that some mergers are pursued with the explicit objective of transferring wealth from employees to shareholders through one of two channels: the creation of monopsony power in local labor markets, and the breach of implicit contracts.

M&As are not a primary driver of monopsony power in labor markets

While economic researchers have always been aware of the impact of market power in product markets, and the regulation of monopoly power dates back to the 19th century, attention to how employer concentration leads to monopsony power in labor markets and depresses wages is more recent and has not yet triggered comparable regulatory initiatives (see, however, Boal and Ransom, 1997; Manning, 2003; and Ashenfelter, Farber, and Ransom, 2010). An emerging literature analyzes the extent to which M&As create market power for employers and depress wages. Arnold (2020)

formulates a theoretical model that builds on standard Cournot models of monopsony power and extends it by introducing the possibility that workers in one industry may move to other industries, which limits firms' monopsony power and depends on the industry-specificity of workers' human capital. Therefore, industry wages depend not only on the employer concentration of the industry in the local labor market but also on the availability of other industries to which workers could move. Accordingly, the monopsony power of firms depends on all factors that influence the bargaining power and the outside options of workers: the industry specificity of their human capital, the enforceability of non-compete agreements, no-poaching agreements among firms (a form of cartelization of the local labor market), and the degree of unionization. Calibrating his model to the data, he finds that local labor market concentration reduces wages by about 4 to 5 percent relative to a scenario in which labor markets are fully competitive. However, he also shows that M&As account for only a small fraction of the changes in local labor market concentration, which are largely driven by how firms shrink or grow organically.

Prager and Schmitt (2021) analyze mergers in the hospital industry and show that they reduce wages under some conditions. Specifically, they group workers into three categories: unskilled, those with general skills (e.g., administrators), and those with industry-specific skills (e.g., nurses). Post-merger wage growth does not slow down for unskilled workers, but wages are 4.0% lower for non-health professionals and 6.8% lower for health professionals, consistent with the hypothesis that wage effects depend on the industry-specificity of employees' human capital. The authors compare mergers that increase local labor market concentration with those that do not increase concentration (i.e., if hospitals are in different locations) and find that only concentration-increasing mergers reduce wages. They conclude that the creation of monopsony power is the most plausible channel through which M&As depress wages.

Benmelech, Bergman, and Kim (2022) perform a large-scale study of how the concentration of local labor markets affects wages in the US and use M&As as instruments. They find that M&As that move the Herfindahl index of local labor market concentration by one standard deviation reduce wages between 9.1 and 14.4 percent. This negative relation increases in magnitude over time and is mitigated by higher degrees of unionization. These findings indicate that the impact of local labor market concentration is reduced by workers' bargaining power.

Bai, Cao, Hull, et al. (2024) construct a measure of local labor market competition based on data on firms' labor demand obtained from job postings. The measure reflects proximity in terms of occupational skill requirements as well as geography. They find that their measure strongly predicts M&As: a one-interquartile increase in the measure of local labor market competition increases the probability of a merger by between 7% and 21%, depending on the empirical approach. Moreover, an

analysis of employee ratings of their employers shows that M&As with a higher score of local labor market competition have lower employee expectations for compensation and career outcomes. Note, however, that reduced career outcomes would also result if these M&As are driven by efficiency considerations to consolidate operations and achieve economies of scale. Cicero, Shen, and Shenoy (2025) address this ambiguity and ask whether M&As create value through efficiency gains from consolidation and economies of scale, or from creating monopsony power in local labor markets. They find that a higher increase in local labor market concentration increases the likelihood of M&As and increases the stock market returns to the combined firm of those that are announced. However, this wealth effect is stronger if the skills of workers can be redeployed more easily and if non-compete agreements are less enforceable. Both findings are consistent with the efficiency-gains channel and inconsistent with the monopsony-power channel. Analyses of the returns of rival firms and those of customers and suppliers buttress the same conclusion.

De la Parra and Glaeser (2025) develop a measure of labor market competition based on textual analysis of online job postings and show that firms with more similar labor demand are more likely to merge, indicating that M&As may be driven by labor market competition. However, the paper does not analyze the outcomes of competition-reducing M&As for employees. Finally, He and Xue (2025) show that competition-reducing M&As also affect outcomes other than wages. They develop and test a theoretical model and study more than 100,000 inventors affected by 3,300 mergers between innovative firms over the period 2005 to 2017. If firms' labor-market power increases after M&As, the number of patents, wages, and the job mobility of high-impact innovators of merging firms declines significantly.

Overall, the wage effects documented in the literature on monopsony power in labor markets provide robust evidence that M&As increase the market power of employers at the expense of workers and depress wages. However, this effect is obtained only if the increase in concentration is sufficiently strong and restricted to workers with significant industry-specific human capital. Moreover, the effects on employment and wages do not conform to the predictions of standard monopsony models, and understanding these effects requires models with additional frictions. Moreover, M&As are not a primary driver of local labor market concentration, and they are not primarily undertaken to depress wages. In fact, the employment effects and the wealth effects of M&As on product market rivals, suppliers, and customers suggest that M&As are undertaken for efficiency reasons. The monopsonistic effects documented in the literature are probably best interpreted as an – albeit important – side effect of M&As, alongside the other side effects discussed in Section 4.5.1.

M&As do not create value through a "breach of trust" and related wage effects.

Starting with the much-cited contribution of Shleifer and Summers (1988), the literature on M&As has always been concerned that gains to shareholders in hostile takeovers may not constitute the creation of wealth but transfers of wealth from employees to shareholders. The evidence is based on four case studies. While subsequent large-scale empirical studies of wage effects found that some transfers of wealth exist, either through depressing wages or the appropriation of surpluses in pension funds, these transfers are either small or at least not a dominant source of the gains from takeovers (Rosett, 1990; Bhagat, Shleifer, and Vishny, 1990; Pontiff, Shleifer, and Weisbach, 1990).

Recent research has picked up on the question of how M&As affect wages. He and le Maire (2022) use Danish data from 1995 to 2011 and apply the AKM method (see Section 4.2) to measure the manager-specific component of wages managers pay to workers. They show that the manager-specific wage premium is substantial and strongly predicts management turnover. Managers who pay high wage premiums are more likely to be demoted to lower-paid non-managerial positions and less likely to be promoted to higher-paid managerial positions. Moreover, M&As pair acquirer-managers who pay 1.4% lower wage premiums with target managers who pay 1.8% higher wage premiums, and target employees' wages decline relative to control firms by 2% after M&As. Dobbelaere, McCormack, Prinz, et al. (2022) pursue a related idea and use the AKM method to estimate firm-specific wage premiums and separate workers who are more highly paid ("over-placed") relative to their human capital from those who are paid less. They observe that workers in the former group experience a threefold higher reduction in employment (retention and hours worked) compared to those who are paid less. While these studies show that the market for corporate control penalizes managers (workers) who pay (receive) more than the industry standard, this observation is difficult to align with the breach-of-trust mechanism of Shleifer and Summers (1988).

Lagaras (2023) undertakes an extensive analysis of the wage effects of mergers in Brazil and shows that M&As have negative short-term employment and long-term wage effects on employees, and that firms that pay higher wage premiums are more likely to become the targets of mergers. He discusses the breach-of-trust as well as the monopsony channel and separates employees into those who stay with the target firm and those who leave. The breach-of-trust mechanism of Shleifer and Summers (1988) focuses on those workers who stay and are locked into their current employment because of the specificity of their human capital, which forces them to accept lower wages. By contrast, Lagaras (2023) finds no effect on the workers who stay with the firm and shows that the negative wage effects are concentrated in those who leave and accept lower-paid employment at other firms. He also shows that wage effects do not depend on the degree of geographical overlap and the merger-induced change in concentration in local labor markets. Similarly, in one of the few studies that also investigates

the effects on the employees of acquirers, Gehrke, Maug, Obernberger, et al. (2025) show that the majority of their sample of German workers experience wage increases, and that this observation applies to workers who stay as well as to those who separate either from the target or the acquirer. These findings are at odds with the breach-of-trust as well as with the monopsony-power channels. Overall, the findings discussed in this section associate M&As with negative wage effects but do not provide evidence for the breach-of-trust channel and are more consistent with the removal of wage payments above the industry norm and the monopsony channel.

Summary of M&As

Employees play a critical role in the success of M&As: The literature has shown that the ability to reorganize the workforce is of primary importance for the volume of transactions as well as for the creation of synergies. Similarly, M&As have a first-order impact on employees, which differs significantly across merger types and employees. However, even though the literature on the subject is large, studies usually focus on the type of transaction (e.g., hostile takeovers) but not on the primary motivation for the merger. Hence, with some uncertainty, we can infer that the impact of mergers on employees is negative if M&As consolidate operations and positive when M&As are undertaken to acqui-hire the target's workforce. When M&As are undertaken to transfer technologies or to combine complementary skills, then they probably benefit those employees who possess the relevant skills, and retaining them may even be critical to merger success. Developing a better understanding of how different types of M&As affect employees, which are potentially different for operational employees, highly-skilled employees, and innovators, may be a fruitful area for future research.

Given the diversity of reasons for mergers and sources of synergies, there is no unambiguous way to locate M&As within the life cycle of the firm. In fact, M&As have been associated with three different types of constraints, which prevail at different stages of the life cycle: human-capital constraints (the acqui-hiring argument, see Section 4.5.1 above), which dominate for start-up firms; financial constraints (Almeida, Campello, and Hackbarth, 2011; Erel, Jang, and Weisbach, 2015), which dominate after the start-up phase; and constraints from the lack of growth opportunities (Levine, 2017; Wang, 2018), which dominate for mature and declining firms. Levine (2017) and Wang (2018) develop and structurally estimate models in which firms that lack growth options but have the management processes and organizational capital to produce efficiently become acquirers, firms that own growth options but cannot produce efficiently become targets, and firms with balanced abilities to produce and grow stay out of the M&A market. This argument suggests that firms become targets because they lack access to organizational capital, which acquirers may provide, in parallel to the role of acquirers for overcoming financial constraints. In these transactions, acquirers are neither constrained by a lack of financial nor human resources. Instead, they are constrained by a lack of

growth options. While life-cycle implications arise immediately from these models, the models themselves are static and do not explicitly relate productivity differentials to organizational capital.

4.6 Other transactions and mechanisms

The previous sections summarize the large amount of work that has been done on start-ups, IPOs, private equity investments, and mergers and acquisitions. (The literature on bankruptcies is discussed in Section 3.2 in the context of capital structure.) By contrast, other transactions have received little or no attention. Specifically, we would expect that the large interest in M&As documented in Section 4.5 is based on a broader interest in transactions that redraw the boundaries of the firm. Yet, I could not identify a single study that discusses the implications of divestitures for employees or how human capital considerations and the break-up of internal labor markets are potentially relevant for divestiture decisions. Similarly, the detailed discussion of IPOs in the literature (see Section 4.3) is not matched by a similar interest in SEOs. The only study at this point is Kim, Li, Lu, et al. (2024), who analyze a large sample of Chinese SEOs between 2000 and 2012, a period in which two regulatory reforms of SEOs in China help to isolate exogenous variation in SEOs. Their main finding is that SEOs facilitate skill-biased technological change, such that the employment share of high-skilled employees who perform tasks that are complementary to new technologies increases at the expense of the employment share of production workers. These findings are consistent with the notion that firms use SEOs in the later stage of their life cycle to finance investments that increase the efficiency of production.

Some closely-related papers investigate mechanisms other than M&As through which firms may increase their monopsony power in local labor markets. One such mechanism may be common ownership, and Goshen and Levit (2025) develop a theory of a causal mechanism through which common ownership may affect wages: common ownership triggers stronger advocacy of strong, shareholder-friendly governance that empowers hedge funds and reduces investment levels as well as wages. Azar, Dai, Qiu, et al. (2024) analyze the connection between common ownership and employees' earnings empirically. They use S&P 500 index additions as a source of exogenous variation for common ownership and show that it leads to a reduction of annual wages per employee of the firms that were added to the index by 1.8%, or about $900 per year. Interestingly, employment increases as well, which is inconsistent with the standard oligopsony model with an upward-sloping supply curve. However, the authors show that their findings can be rationalized in a model in which firms engage in costly recruiting efforts, which become more profitable when wages decline. Begley, Haslag, and Weagley (2025) study if collusion between firms may be facilitated through common board members. They combine data on boards and on employees' resumes to relate flows between firm pairs to the initiation of common directorships. In their baseline estimation, flows between firm pairs

decline by 27% after the firms began to share a common director. This decline is much stronger for managers and highly-skilled employees, in states that do not enforce non-compete agreements, and among firms that are closer in product market similarity. Hence, common ownership and shared directorships may substitute for outright mergers as coordination devices to create monopsony power in the labor market.

4.7 Overall summary of the life cycle of the firm

The discussion of transactions in this section describes how firms change their ownership and governance structure as they move through different phases in their life cycle. Building on the concept of a dynamically optimal ownership structure advocated by Alchian and Demsetz (1972), the discussion in this section suggests expanding their theory to accommodate additional constraints and to relate different stages of firms' life cycle to the most pressing constraints firms try to address. While Alchian and Demsetz (1972) identify agency issues as the major source of frictions, this section suggests three other constraints: firms may lack access to human capital, to financial resources, and to growth options.

A highly stylized and simplified narrative of the different stages of the life cycle may then characterize them by the constraints firms prioritize at each stage. The start-up stage is marked by exploration and the development of a unique business model, and firms focus on hiring employees and on building organizational capital. They also require access to finance that, to some extent, depends on their hiring success. When firms move to the expanding phase, they emphasize access to financial resources. If they still need to build and protect organizational capital, they prefer private funding through growth equity; otherwise, they go public. The IPO stage is then characterized by exploitation, standardization, and employee turnover. When firms enter the mature and declining stages of their life cycle, they are unlikely to be constrained in their access to human or financial resources but may run out of ideas, i.e., opportunities to grow, and may complement their technology and skills through acquisitions.

One common feature of all transitions in the life cycle is high employee turnover, which has been documented for private equity buyouts, IPOs, and M&As but is relatively understudied compared to the large literature on net employment and wages. It appears that firms do not simply scale up their operations as they grow, but also change their internal structure, their internal division of labor, and, consequently, the composition of their workforce. In all likelihood, changes in the external ownership structure of the firm also lead to changes in its internal structure (see also Zingales, 2000, who may have been the first to pay attention to this issue), which in turn affects the career paths available to employees (Baker, Gibbs, and Holmstrom, 1994; Ferreira and Nikolowa, 2024), and the degree of autonomy of decision-making granted to them (J. D. Kim, 2020). An emerging literature leverages more granular data to document how firms' organization and workforce change over their life cycle, and

some contributions use new tools to map their hierarchical structure (e.g., Huitfeldt, Kostøl, Nimczik, et al., 2022; Ewens and Giroud, 2025). More empirical research in this direction is needed, as well as a more complete theory of how firms adapt their internal structure and their ownership structure as they grow.

The simplified narrative does not recognize that firms may move back and forth between stages. For example, it seems that private-equity buyouts reverse, to some extent, the organizational changes associated with IPOs (more hierarchies, more hiring in the higher levels of the firm). It appears that firms may sometimes revert earlier developments and move between concentrated ownership and dispersed ownership. Concentrated ownership appears to be better suited to address entrenchment and imbalances of power and temporarily reverse dispersed ownership, e.g., through private equity buyouts, blockholder governance, or acquisitions.

Overall, while the dynamic perspective of the life cycle of the firm provides a coherent picture, it still has many gaps. The reason is that most researchers do not adopt such a perspective and construct samples based on transaction types or ownership types, which form the subheadings of this section. However, a static perspective based on transaction types assumes that, for example, private equity buyouts are different from mergers and acquisitions but are sufficiently homogeneous within each transaction type. Yet, the discussion above has distinguished two very different types of private equity buyouts and four different types of M&As, and multiple stages of the development of start-ups. Accordingly, a private-equity-funded young firm in the expansion phase may be more similar to a young public firm in the expansion phase than to a mature private-equity-owned firm that has been taken private to address agency problems. Similarly, a mature private-equity target may be part of a "buy-to-build" strategy, and may thus be more similar to the target of a consolidating merger than to firms financed by growth equity. Hence, one suggestion for future research is to complement the conventional perspective based on transaction types with a dynamic perspective on life cycle stages.

5 Human capital in financial markets

The previous sections identify a range of factors through which financial contracting, employee relations, and investments in intangibles contribute to firm value by providing critical resources and sustaining the cooperation between providers of capital and labor. Accordingly, it is legitimate to ask whether financial markets incorporate these aspects in market prices. Whether and how they can do this is not obvious: Section 2.1 shows that intangible investments and the returns attributable to these investments are difficult to observe and need to be inferred indirectly from observable data, including market prices. Edmans (2009) theorizes that investors with sufficient stakes and skills may have the ability and incentives to make informed guesses about whether cash outflows constitute investments

or should be regarded as cost overruns, but the assessments of these investors may reach the market with a delay and lead only to a partial incorporation of their information in market prices (Hong and Stein, 1999). Hence, a significant literature studies two overlapping questions: Do financial markets value intangible assets related to human capital, often referred to as the quality of labor relations, organizational capital, or corporate culture (Section 5.1)? And how do markets reflect the risks inherent in human-capital-intensive production, e.g., from power struggles, labor mobility, or fixed commitments to long-term contracts (Section 5.2)?

Separating these questions is difficult and requires methodological effort: If investors have only a limited ability to recognize and evaluate intangible investments, then markets are consistently surprised by cash flow news related to these investments, which then generate abnormal returns, potentially over extended periods. How should these effects of cash flow surprises on returns be separated from effects on the cost of capital (expected returns) stemming from the riskiness of these cash flows? Some studies provide separate analyses of returns and cash flows or earnings to address this methodological issue (e.g., Edmans, 2011; Agrawal, Hacamo, and Hu, 2021; Regier and Rouen, 2023; Bae and Kang, 2023). In other studies, these questions are left open, and methods that separate cash-flow effects from expected-return effects in other areas of asset pricing (e.g., Campbell and Shiller, 1988; Campbell and Vuolteenaho, 2004) are usually not applied. Accordingly, the classification of studies under the cash-flow channel on valuation (Section 5.1) or the expected-return channel on risk (Section 5.2) in this survey is, to some extent, arbitrary.

Some papers provide event-study evidence, which is not easy to interpret. For example, Hallock (1998) and Farber and Hallock (2009) document the time-series trend in event-study returns to layoff announcements. These announcement returns are negative on average, and for most announcements, they are also not associated with compensation premiums to CEOs, which leads Hallock (2009) to comment that layoffs are in themselves a puzzle because “no one seems to be substantially better off and many are worse off” (p. 90). However, stock market reactions to layoff announcements reflect information about the state of the firm as well as information about the benefits of the layoff itself, and disentangling these two pieces of information is not straightforward, so the observation of negative stock price reactions is difficult to interpret. (See the related discussion of interpreting M&A event studies in Section 4.5.)

5.1 Do stock markets value human capital?

An early contribution that analyzes the importance of labor for explaining firm value is Merz and Yashiv (2007). They develop and structurally estimate a production-function model with adjustment costs for capital and labor and establish that firm values are better explained by incorporating not only the

capital stock but also employment, the hiring of employees, and investment flows. Thus, unlike earlier Q models, their model also provides a role for labor.

The first question raised above is whether the "stock market fully values intangibles" (Edmans, 2011). He uses inclusions in the list of the *100 Best Companies to Work for in America* ("BC ranking"), compiled by the *Great Place to Work Institute* and published by *Fortune* magazine. The ranking is based on surveys and covers employees' perceptions of their relationships with their employers. Edmans (2011) constructs portfolios of firms included in the ranking and measures an annual outperformance of 3.5% to 3.7% relative to non-ranked firms by estimating alphas in a Fama-French-Carhart model. He attributes this outperformance to the cash-flow channel described above by combining two findings: Inclusions in the BC ranking are associated with significant earnings surprises, and earnings surprises are associated with higher event-study returns. Edmans, Li, Pu, et al. (2024) extend their framework to a study of 30 countries and confirm the results for the US, albeit with significant variation across countries. In addition, they hypothesize and show that the link between job satisfaction and firm value is stronger in countries with more flexible labor markets, measured by the OECD's index of employment protection legislation. Finally, they show that the benefits of employee satisfaction are higher in industries with greater labor mobility and a larger fraction of skilled employees. The authors attribute these findings to the influence of a more attractive work environment on firms' ability to recruit and retain employees. The study also shows that firms with higher employee satisfaction and in countries with more flexible labor markets experience higher stock returns as well as higher valuations (Tobin's Q) at the beginning of the event window, which again suggests that the stock market incorporates information about intangibles, albeit only partially. Guiso, Sapienza, and Zingales (2015) also use the response data from the *Great Place to Work Institute* and construct variables that measure the perceptions of management's ethics from employees' expressions of agreement or disagreement with the statements "Management's actions match its words" and "Management is honest and ethical in its business practices." They find that these variables predict Tobin's Q and the return on sales.

Huang, Li, Meschke, et al. (2015) expand on the literature on the employment relations of family firms by analyzing employee reviews on Glassdoor, which proxy for employee satisfaction. This study shows two sets of findings, which use a two-stage Heckman approach to control for several selection effects, including the endogenous decisions of families to retain their ownership. The first set of analyses shows that employees of family firms rate their firms higher than employees of non-family firms and that the higher ratings specifically concern human resource policies (e.g., career opportunities, compensation, work-life balance). However, the positive effects are concentrated entirely in firms that are managed by their founders, whereas there are no differences between heir-managed firms and

non-family firms. The second group of analyses provides evidence for the impact of employee ratings on measures of firm valuation (Tobin's Q) and firm performance (return on assets). However, it remains unclear whether it is the component of ratings related to family ownership and founder management that can be associated with improved valuation and performance.

Israelsen and Yonker (2017) study how the loss of key employees impacts firm valuation. They identify key employees by collecting data from disclosures that firms hold life insurance policies on these employees, often members of the management team or major innovators. These policies insure firms against the deaths but not against the voluntary departures of key employees, and the paper shows that firms lose about 4% of firm value around announcements of the departures of key employees; the largest losses are concentrated in those firms that pay higher insurance premiums, scaled by total assets.

Shan and Tang (2022) conduct an event study on Chinese firms around the data of the first COVID-19 lockdown in Wuhan on February 3, 2020. They show that firms with above-median employee satisfaction outperformed those below the median by 1.3 percentage points on that day, which is economically significant in relation to the 7.7 percent drop in the Chinese stock market on that day. The authors attribute this finding to the higher value of employee morale during a period that required employees to work from home.

Fedyk and Hodson (2023) ask whether stock markets correctly value firms' investment in highly-skilled employees. They build a data set of US employees between 2000 and 2016 with detailed information about their skills and backgrounds from resumes. Their key results show that firms with abnormally high investments in skilled employees (e.g., in IT, mobile networks, or software engineering) enjoy higher valuations (Tobin's Q) but lower subsequent stock returns as well as lower profitability, which suggests that stock markets overvalue investments in highly-desired skills. Regier and Rouen (2023) evaluate the extent to which stock markets incorporate information about the resources firms invest in their employees. Identifying such investments is hampered by the usual shortcoming that financial statements record them as expenses (see Section 2.1 above). Regier and Rouen (2023) disentangle the investment component of personnel expenses from the predicted values in regressions of operating income against lagged personnel expenses and show two results. First, analysts' forecasts do not fully capture the investment component of personnel expenses and are, on average, too pessimistic in forecasting the earnings of firms that invest more heavily in human capital. Second, the investment component of personnel expenses positively affects stock prices, whereas the remaining cost component has the opposite influence, which indicates that investors can, to some extent, correctly identify companies' long-term investments in their employees. However, sorting stocks based on the investment component and comparing the alphas across quintiles in five-factor regressions shows that

the top quintile outperforms the bottom quintile by 4.8% (7.8%) for equally weighted (value-weighted) portfolios. Hence, analysts and stock market investors seem to be consistently surprised by the high earnings of firms that make long-term investments in their employees. Finally, Bae and Ha (2025) show that employee satisfaction positively predicts stock returns for a sample of over 900 Korean firms from 2015 to 2021. They find that a portfolio of stocks with high employee satisfaction outperforms a low-satisfaction portfolio by 1.1% per month and that this return difference cannot be explained by standard risk factors. They attribute their results to improvements in labor productivity and argue that it cannot be explained by reduced employee turnover.

All studies discussed in this section provide evidence consistent with the notion that employee satisfaction and training have positive effects on firms' valuation and returns. However, two studies (Shan and Tang, 2022; Bae and Ha, 2025) only analyze returns, two studies (Guiso, Sapienza, and Zingales, 2015; Huang, Li, Meschke, et al., 2015) only analyze valuation-related variables, whereas the remaining studies (Edmans, 2011; Edmans, Li, Pu, et al., 2024; Fedyk and Hodson, 2023; Regier and Rouen, 2023) provide effects for both. In line with the discussion at the beginning of this section, these results suggest that the stock market, indeed, values intangibles, and that investments in employees' well-being and training systematically lead to higher valuations. However, the stock market does not seem to fully recognize these investments at the time they are made. Hence, the information about these investments is incorporated in market prices only gradually, as the stock market is consistently surprised by positive earnings and cash flow news of firms that invest more in their employees.[33]

Overall, there is still little work on the valuation of human capital and organizational capital compared to the large body of work on the pricing of risks related to these factors, which is reviewed below. Three issues stand out that deserve further attention: First, there is no quantitative assessment – and often no assessment at all – of the speed and accuracy with which stock markets incorporate information about human-capital-related investments (however, see the studies by Agrawal, Hacamo, and Hu (2021) and Regier and Rouen (2023) cited above, among others); second, we have only a limited understanding of the factors that determine the speed and accuracy with which human-capital-related information is incorporated. Some recent contributions in this direction are Dittmann, Montone, and Zhu (2023), who identify stocks that are difficult to price because of limits to arbitrage; and Kieback, Gleason, Thomsen, et al. (2025), who show that the presence of worker representatives leads to better information incorporation. More research in this direction is needed, also on other potential factors that might determine the incorporation of information, e.g., the presence of blockholders and

[33] Earlier studies of the same question for different intangible assets reached the same conclusion: See Chan, Lakonishok, and Sougiannis (2001) on the incorporation of information about R&D expenditures and Fornell, Mithas, Morgeson, et al. (2006) on the information about customer satisfaction.

specialized institutional investors, or firms' human-capital-related disclosures. Third, and finally, it would be interesting to study the mechanism proposed by Edmans (2009) that a higher speed and accuracy of information incorporation of intangibles-related information into stock prices creates incentives for firms to invest in employees. The only effort in this direction is Richmond, Tang, and Wang (2024), who show that increased derivatives (CDS) trading reduces measures of short-termism (e.g., earnings smoothing, narrowly meeting earnings targets) and improves measures of employee welfare. More research along these lines is needed to establish whether there is a stable relationship between market efficiency, short-termism, and investments in intangible assets.

5.2 Human capital as a risk factor

Returns to human capital may affect the risk premium in the prices of financial assets for two largely unrelated reasons. The first reason is that employees are also investors and hold non-tradeable assets like human capital as well as financial assets. Hence, their need to hedge the returns to their human capital affects their portfolio strategies for holding financial assets, which thus affects the pricing kernel and, thereby, the returns on all assets (e.g., Eiling, De Jong, Laeven, et al., 2025; Gómez, Priestley, and Zapatero, 2016). This survey addresses this issue briefly and only to the extent that it is required as background for the subsequent discussion. The focus of this section is on the second reason why human capital is a risk factor in asset prices, namely that the frictions in labor markets affect the riskiness of firms' cash flows and how firms are exposed to economy-wide shocks. While the literature has long recognized that frictions in product markets and in financial markets create risks for firms and that these risks are priced, a corresponding recognition that the same holds also for frictions from labor relations and the potential disruption from losing key employees is relatively new. Section 3 discusses these frictions and how firms manage them by adapting their capital structure, their compensation and hiring policies, or their ownership structures. This section revisits these frictions and asks which risks they create for asset prices. Specifically, we will study operating leverage ("labor leverage") stemming from firms' commitments to their employees, and labor mobility and power struggles, which may disrupt firms' operations.

Human capital is an important asset that may be traded indirectly.

The importance of accounting for wealth tied to non-tradeable assets, and to human capital specifically, has long been recognized in the asset-pricing literature. An in-depth survey of this literature is beyond the scope of this article. However, several key insights are relevant. First, human capital is by far the most important asset class and is often estimated to form a share of total wealth above 90%, hence, about one order of magnitude larger than the share of financial assets (Lustig, Van Nieuwerburgh, and Verdelhan, 2013; Palacios, 2015). Second, adding returns to human capital at the aggregate level (Campbell, 1996; Jagannathan and Wang, 1996) or at the industry level (Eiling, 2013)

improves the performance of asset pricing models and helps to account for some asset-pricing puzzles, e.g., the size of the equity-risk premium (e.g., Heaton and Lucas, 1996) or the pricing of idiosyncratic risk (e.g., Eiling, 2013). Third, there is some evidence that individuals decide on stock market participation and the allocation of wealth to financial assets depending on their exposure to uninsured human capital risk (Betermier, Jansson, Parlour, et al., 2012; Bonaparte, Korniotis, and Kumar, 2014; Agarwal, Aslan, Huang, et al., 2022). Thus, the heterogeneity of individuals' exposure to human capital risk can potentially account for the heterogeneity of their holdings of financial assets.

Berk and Walden (2013) develop a model that combines insights from the literature on hedging labor income risks with a discussion of how these hedging needs may be mediated through firms and thus affect firms' cash flows. Their key observation is that employees have two channels to hedge labor income risks: directly, through holding financial assets, or indirectly through their employment contracts, if firms insure their employees against productivity shocks (see Section 3.5). In their model, firms insure workers, who then choose endogenously not to participate in the stock market since their employment relationship already provides sufficient insurance. They argue that their model questions the conventional conclusion that human capital is not traded, simply because not all wealth is traded in financial markets; that it explains the low correlation between asset returns on one side and labor and consumption risk on the other; and that it explains why equity wealth is more volatile and human capital wealth is less volatile than total wealth.

Commitments to employees can be a risk factor.

The corporate finance literature on worker-firm relations surveyed in Section 3 shows when and why firms and workers enter relationships that imply longer-term commitments from firms. The asset-pricing literature takes the rigidities implied by these long-term contracts as a starting point and explores their implications for risk premiums, equity return volatility, and the amplification of macroeconomic fluctuations. The literature has analyzed three labor-related sources of frictions that create additional operating leverage: long-term commitments to workers, associated with rigid wages; collective bargaining arrangements; and adjustment costs for integrating newly-hired employees.

Long-term commitments and rigid wages

An early contribution is Danthine and Donaldson (2002), who construct a dynamic stochastic general equilibrium (DSGE) model based on two observations: First, firms' long-term commitments to their workers create additional operating leverage ("labor leverage"), which enhances the impact of shocks on firms' profits; and, second, firms and workers renegotiate their income shares period by period, which creates idiosyncratic risks to both parties that cannot be insured. They show how two puzzling empirical observations, high return volatilities and the size of the equity risk premium, can be explained in this framework. Favilukis and Lin (2016b) calibrate a dynamic model with infrequent wage

negotiations and thus rigid wages, which makes profits and equity returns more risky (see also Uhlig, 2007).

Donangelo, Gourio, Kehrig, et al. (2019) develop, calibrate, and test a model in which labor leverage predicts expected stock returns. Their key observation is that wages are smooth and respond inelastically to shocks to the firm: whereas a 1.0% decline in sales reduces non-labor costs by 1.08%, labor costs decline by only 0.53%. Building this smoothness into an otherwise frictionless model in which capital and labor are complements shows that the labor share predicts expected stock returns. Finally, Ai and Bhandari (2021) develop a model of the operating-leverage channel that combines risks to labor income and investors. In their setting, firms provide insurance to workers, but neither firms nor workers can fully commit to the relationship because of resource constraints. The limited commitment to employment contracts gives rise to uninsured tail risk of labor income and creates higher return volatility and risk premiums, which increase with firms' commitments to their workers.

Several papers provide empirical evidence in addition to the calibration results shown in the theoretical studies. An early study is Rosett (2001) who shows that estimates of the labor stock, defined as the present value of compensation paid to employees, positively predict the standard deviation and the CAPM-beta of stock returns. Donangelo, Gourio, Kehrig, et al. (2019) document that high labor share firms have higher expected returns, using alternative definitions of the labor share and realized returns and betas of the Hou, Xue, and Zhang (2014) q-factor model as proxies for expected returns. Similarly, Favilukis and Lin (2016a) test if wage growth negatively predicts stock returns if wages are rigid and provide evidence for this prediction at the aggregate level, the industry level, and the state level; moreover, they show that this effect is stronger in industries and states with more rigid wages. Overall, these empirical studies support the conclusions from the theoretical analyses and calibration studies.

Favilukis, Lin, and Zhao (2020) show in a similar framework that the same labor market frictions that explain risk premia and return volatility for stocks also predict risks in credit markets: firms with higher labor leverage have lower financial leverage and lower debt growth but higher credit risk (default spreads and default frequencies). Thus, they conclude that their model based on wage rigidity "provides a coherent accounting of several major financial puzzles (the credit spread puzzle, the under-leverage puzzle, and the equity premium puzzle) in a unified framework." Bhojraj, Jang, Weinbaum, et al. (2024) show that a one-standard-deviation increase in the labor share, measured as the ratio of labor expenses to the total value added of the firm, is associated with a 12.5 basis point increase in loan spreads. Moreover, firms with higher labor leverage also receive smaller loans, shorter-maturity loans, and their loans are more likely to be collateralized. Hence, lenders adjust the price as well as the quantity and structure of loan contracts in ways that are consistent with the notion that labor leverage

increases firm risk. Hence, the empirical studies on labor leverage converge by showing that firms' long-term commitments to compensating their employees create additional risks by increasing operating leverage, and that this risk is priced in bond markets as well as stock markets.

Unions and collective bargaining

In two separate studies, Chen, Kacperczyk, and Ortiz-Molina (2011), (2012) analyze another source of labor-related operating leverage: The additional commitment and reduced operating flexibility created by labor unions. Chen, Kacperczyk, and Ortiz-Molina (2011) ask how the unionization of the labor force affects firms' cost of equity, measured mainly by the implied cost of equity of Gebhardt, Lee, and Swaminathan (2001). The main result is that a one-standard-deviation increase in the unionization rate is related to a 1.23 percentage point increase in the implied cost of equity. Further tests lead the authors to rule out other explanations and to conclude that unions increase operating leverage, thus forming a separate source of labor leverage. Moreover, consistent with this explanation, they find that the unionization premium in the cost of equity is countercyclical and that it is mainly related to the book-to-market channel in a Fama-French three-factor model. Chen, Kacperczyk, and Ortiz-Molina (2012) also show that there is no corresponding premium in the cost of debt. On the contrary, a one-standard-deviation higher degree of unionization is associated with bond yields that are lower by 32 basis points, even after controlling for other factors that determine yields. The authors explain their finding by the close alignment of interests between workers and creditors, both of whom receive payoffs that are relatively insensitive to firm performance in solvent states. The overall conclusion from these studies is that collective bargaining creates priced risks with opposite signs in equity and debt markets. Finally, Qiu and Zhang (2024) compare firms that had the opportunity to renegotiate collective bargaining agreements during the financial crisis in 2008 to those that did not have this opportunity. They show that the former group reduced wage growth during the crisis, whereas the latter group experienced an increase in bond yields and a reduction in new bond issues. Hence, there seem to be two opposing effects: Creditors and workers have largely fixed claims against the firm, which leads to an alignment of interests between them and reduces bond yields. However, they also compete over the priority of their claims (see Section 3.6 on the strategic use of debt) on the firm, and bond yields rise to the extent that workers succeed in establishing the priority of their claims.

Adjustment costs for integrating new hires

Belo, Lin, and Bazdresch (2014) incorporate adjustment costs to labor into a neoclassical dynamic investment-based asset pricing model. The main insight of their model is that firms with more flexibility in hiring (i.e., lower labor adjustment costs) have lower expected stock returns in the cross-section. Firms with lower adjustment costs hire more workers after positive productivity shocks and are then worth more, which reduces the risk premiums on these stocks and gives rise to a "hiring spread:" A 10

percentage-point increase in a firm's current hiring (investment) rate is associated with an 0.7 to 1.5 (1.6 to 2.3) percentage point decrease in its annual future stock returns. Hence, the relative strengths of these adjustments are comparable, and the authors conclude that labor frictions are of comparable importance to investment frictions. Consistent with an expected-return-based interpretation, the model captures this hiring spread, as well as the outperformance of the Fama and French (1993) three-factor model relative to the CAPM. Belo, Li, Lin, et al. (2017) extend the same setup and hypothesize that the hiring premium should be larger in industries with a high-skilled labor force because high-skilled workers are harder to replace compared to low-skilled workers, which is reflected in higher adjustment costs in high-skilled industries. They find support for this hypothesis: the hiring premium is -3.8% in high-skilled industries and -2.2% in low-skilled industries, in each case measured for a 20-percentage-point increase in the hiring rate. They also show the robustness of their findings for a cross-country sample of firms from the G7 countries. Bae and Kang (2022) perform similar tests to those of Belo, Lin, and Bazdresch (2014) and Belo, Li, Lin, et al. (2017) for the Korean stock market and confirm their findings.

The explanations discussed in this section differ in their modeling strategies and the specific frictions they consider, which include rigid wages, long-term commitments to employment, unions, and adjustment costs to changing the labor force. While these details are highly relevant for the quality of the calibrations and for the ability to endogenize key parameters, they overlap in their key mechanism: the modeled frictions contribute to the dissociation of wages from the marginal product of labor and shift risks from employees to firms and their shareholders (see also the model of Berk and Walden, 2013 discussed in the previous section). Thus, wage payments become smoother, profits become more volatile, the labor share becomes countercyclical, and equity returns become riskier as shareholders, and potentially also creditors, absorb the risks shifted from workers to firms.

Labor mobility can be a risk factor.

Employment contracts are asymmetric in that they commit firms to employ and compensate workers, whereas they do not impose an equally long-term commitment on workers, who usually move freely to other firms. Hence, to the extent that firms rely on the long-term availability of human capital, labor mobility creates the risk of disrupting production, and several papers try to estimate this risk and ask whether it is priced.

Donangelo (2014) builds a dynamic model in which firms compete for workers in an industry that features partially-segmented labor markets. To the extent that workers have skills that are transferable to other industries (e.g., network administrators), they leave if firms in these other industries experience positive productivity shocks. By contrast, employees with industry-specific skills (e.g., nurses in the healthcare industry) are less mobile and less likely to move to other industries. The model

shows that labor mobility is like operating leverage in that it exacerbates the impact of industry-level shocks to productivity and creates priced risk for shareholders. The paper then develops a measure of cross-industry labor mobility based on the cross-industry dispersion of occupations (which is high for network administrators and low for nurses). Return regressions show that a one-standard-deviation increase in this measure is associated with a 2.5% increase in annual stock returns, measured with a zero-investment long-short portfolio, which shows that labor mobility creates priced risks for investors. Eisfeldt and Papanikolaou (2013) develop and calibrate a model in which the division of surplus between employees and shareholders depends on the development of technology. Specifically, improvements in the productivity of human capital ("organizational capital") increase the outside options of these employees, and shareholders receive less of the firm's surplus when the productivity of human capital increases; thus, the outside options of employees improve. Using cumulated SG&A expenses as a measure of human capital intensity, the empirical analysis shows that firms that are more reliant on human capital are smaller, more productive, and have higher valuations (Tobin's Q). However, these firms also have 4.7% higher average returns compared to those that rely less on human capital.

Several studies focus the discussion of labor mobility on key employees, such as top executives or innovators, whose presence in the firm is critical for its value and success. Acharya, Pagano, and Volpin (2016) develop a model in which highly-talented employees switch employers more frequently to reduce firms' ability to discover their talent, thus self-insuring themselves against the risk of discovering their talent. In their study of key employees discussed above, Israelsen and Yonker (2017) show that firms with a stronger reliance on key employees have risk-adjusted stock returns that are 0.84% to 1.20% higher compared to those that are less reliant on key employees. Boguth, Newton, and Simutin (2022) focus on top executives and argue that firms are more exposed to the risk that critical employees leave the firm if the top management team is larger. They show that average stock returns in cross-sectional regressions increase by 1.2% per year if the (residualized) size of the top management team increases by one member. However, larger teams are beneficial as a hedge against the departures of CEOs: CEO departures have a strong negative effect on firms with smaller but not on those with larger management teams. Chen, Huang, and Wei (2013) also focus on the role of CEOs and use the CEO pay slice (CPS), defined as the proportion of top management compensation awarded to the CEO, to identify potential risks to the firm. They also measure expected returns using the implied cost of capital (see the discussion of Chen, Kacperczyk, and Ortiz-Molina, 2011 above), which has the advantage that it is less likely to confound changes in expected cash flows and growth opportunities with changes in the cost of capital. They find that moving from the 10^{th} to the 90^{th} percentile in the distribution of the CEO pay slice increases the cost of equity by 14 basis points and that the cost-of-equity effects can account for 43% of the valuation effects of the CEO pay slice reported by Bebchuk,

Cremers, and Peyer (2011). They also provide evidence for the notion that a portion of the risk premium associated with the CEO pay slice can be attributed to CEO succession risk, in line with the evidence in Boguth, Newton, and Simutin (2022) for the critical role of the CEO for firm value.

Shen (2021) uses administrative imperfections in the allocation of permanent resident status ("green card") to foreign workers in the US as an exogenous source of variation in labor mobility: foreign workers can switch jobs more easily if they hold a green card compared to a temporary work visa (H-1B), which ties them more strongly to their current employers. The paper shows that restrictions on labor mobility are valuable for firms, which appropriate monopoly rents over skilled employees. His estimates suggest that the value of this restriction is about 6% to 7% of firm value, or around one-third of a skilled worker's annual compensation. Moreover, firms reduce investments when skilled foreign workers are more mobile, in line with the notion that labor mobility increases firms' labor adjustment costs and that physical capital and human capital are complementary. In summary, all studies converge on the conclusion that labor mobility creates priced risks for investors. Hence, labor mobility may be costly for firms through two channels: the risk from disruptions increases firms' cost of capital, and the price-setting in local labor markets may reduce firms' monopsony power. These effects, together with the externalities that restrictions on labor mobility create (see Section 3.4) lead to ambiguous welfare implications of such restrictions.

Summary

The argument in Sections 3 and 4 suggests a notion of firms as networks of relationships in which employees and investors cooperate, and managers and entrepreneurs sustain this cooperation through contractual and non-contractual promises. This section first shows that financial markets reward successful cooperation: firms that are more attractive employers are more committed to their employees, invest more in their well-being and training, and enjoy higher valuations. However, financial markets recognize the quality of cooperation only imperfectly and are consistently surprised by the cash flows of firms that invest more in these types of intangible capital. Hence, it is likely that firms underinvest in intangible capital because managers take cues from stock prices, which also form a part of their compensation. This subject remains unexplored, and future research should address the connection between the quality of information aggregation about intangibles in stock prices and the formation of intangible capital.

The second part of this section shows that the fragility of the cooperation between employees and investors is costly, as long-term commitments to employees reduce firms' flexibility, increase their operating leverage, and consequently their cost of capital. Similarly, disruptions through labor mobility or unions are reflected in riskier cash flows and a higher cost of capital. The cost-of-capital implications put the discussion of long-term employment relationships discussed in Section 3 in a different context.

The conclusion in Section 3 was that long-term commitments are valuable as employees reward firms with lower wages and higher investments in firm-specific human capital in exchange for employment protection. However, long-term commitments not only increase bankruptcy costs but also the cost of capital, which creates a more subtle trade-off for the costs and benefits of long-term contracts.

6 Conclusions and reflections

Since the Introduction to this survey already provides summaries of the individual sections, detailed summaries of the argument will be omitted here. Instead, I will offer a couple of additional reflections. Sections 2 and 3 show that human capital and other assets that are created with human capital ("knowledge capital," "organizational capital") have increasingly displaced physical capital, and that this trend is causal for several trends in corporate finance, including the decline in leverage, increase in cash holdings, and the shift toward share repurchases. Various mechanisms support this shift: employees pass on their costs of financial distress to firms, which ultimately internalize them; human capital and intangibles provide little collateral; and intangible assets are sometimes better financed by borrowing from employees through deferred compensation. One important insight from this discussion is that firms face financial constraints as well as constraints in their access to human capital, and that these constraints depend on each other, since employees are more likely to provide services to a firm that also has the support of investors, and vice versa.

Extant theories of the firm seem to struggle with this setting. Gibbons (2005) surveys four major economic theories of the firm and remarks that they all exclude "resources (…), routines (…), and knowledge" (p. 202), thus precisely those aspects that would be relevant for the understanding of the role of human capital and intangible assets in the theory of the firm. Much of the theory of corporate finance sees the firm as a "nexus of contracts," following Jensen and Meckling (1976). Since contracts can only reassign alienable rights, inalienable inputs such as human capital remain mostly on the sidelines.[34] Alternatively, the firm is seen as a collection of physical assets (following the property-rights theory of Grossman, Hart, and Moore; e.g., see Moore, 1992), which does not accommodate intangible assets. A tentative proposal would be to expand on the approach of Alchian and Demsetz (1972), who emphasize that firms do not own all of their inputs. Instead, the owners of these inputs cooperate by contracting through a centralized agency, typically the management or an entrepreneur. However, whereas Alchian and Demsetz (1972) focus on agency costs as the major friction in this cooperation, this survey argues that additional constraints need to be considered, which limit firms' access to both human capital and financial capital; the discussion of M&As also touches on the access

[34] However, see: Hart and Moore (1994); Jaggia and Thakor (1994); Blair (1999); Roberts and van den Steen (2000); Bolton, Wang, and Yang (2019).

to growth options, or ideas, although this topic is largely outside the scope of this survey. Optimal governance and ownership structures then emerge as second-best solutions to address these constraints, which was one of the main conclusions from Section 3.

A further step to expanding this framework makes it explicitly dynamic. This is important because firms accumulate resources over time, which shifts the emphasis between constraints. In addition, the second-best solutions to sustaining a viable cooperation between input owners may lead to entrenchment and inefficiencies, which then require changes in ownership and governance structures.[35] Hence, Section 4 advocates for a perspective based on the life cycle of the firm. In a highly-simplified summary, young and start-up firms develop organizational capital and are primarily concerned with human-capital constraints, but also with the financial constraints that follow from that; expanding firms address mostly financial constraints but still pay attention to the protection of their organizational capital; mature and declining firms mainly struggle with the lack of growth options. As the constraints that are most binding on firms' operations change, so does the bargaining power of the owners of different inputs. The research reviewed in Sections 2.3 and 4 suggests that the increased importance of human capital for young firms has reduced the bargaining power of investors relative to employees, whereas the opposite happened for mature, public firms.

Not developing a life-cycle perspective appears to limit much of the empirical work surveyed here, which typically builds samples based on transaction types (private-equity buyouts, M&As, IPOs). However, these transactions are solutions that may address a range of different problems. For example, private equity buyouts may address governance failures or financial constraints, and M&As may address excess capacities, human-capital constraints, financial constraints, or a lack of growth options. Hence, much of the extant research works backward from transaction types – the solutions – to the underlying problems that firms are trying to solve, which may be very heterogeneous. By contrast, an explicit life-cycle perspective would start with the problems, i.e., with the constraints or governance failures that firms try to address, and then work forward to the solutions, which would better illuminate how firms make choices between them. There may well be different solutions to the same problem, e.g., when some firms use private equity and others use public funding when they want to expand operations. Understanding the trade-offs involved in these choices would be informative. Ideally, the empirical work advocated here would build on conceptual advances from integrating the different building blocks discussed in Section 4.1 into a coherent theory of how resource constraints, financing sources, and ownership structures develop over the life cycle of the firm.

[35] Hellwig (2000) is one of the few who argue for a more historical approach to contracting in which developments can get off track and lead to serious inefficiencies, compared to an approach in which all arrangements and contingencies are included in an ex ante optimal design.

A dynamic approach appears necessary for a satisfactory modeling of employment relationships and human capital. Dynamic contracting models can simultaneously accommodate explicit, formal contracts and implicit, informal contracts, which are self-enforcing and depend on repeated interactions that are often modeled in repeated games. In these models, formal contracts play a critical role in defining outside options and thus shape informal relationships. An early example is the dynamic wage model of Harris and Holmstrom (1982), which became a workhorse in the analysis of capital structure (Berk, Stanton, and Zechner, 2010, see Section 3.2) and financial constraints (Michelacci and Quadrini, 2005, 2009, see Section 3.3). Dynamic contracting models address almost any other issue discussed in this survey.[36] By contrast, conventional theories of the firm that conceive of the firm as a nexus of contracts, or as a collection of (physical) assets, and rely on static models, can naturally only incorporate formal contracts. Hence, they cannot integrate the informal, self-enforcing characteristics of employment relationships or analyze the complementarity between formal and informal contracts. As such, they struggle with making a conceptual distinction between employees and contractors.[37] By contrast, theories that adopt a "relational contracting" paradigm and analyze repeated interactions have a better grasp of the limited commitment that both employees and firms can make to the employment relationship, which gives rise to the interdependent constraints in financial markets and labor markets (see Sections 3.5 and 3.6).[38]

The relational-contracting paradigm advocated here allows for a better analysis of the way in which human capital can be an asset of the firm. The inalienability of human capital and labor mobility pose challenges to this notion. Employees and not firms own human capital. However, the workforce of the firm forms a significant component of its value (Belo, Gala, Salomao, et al., 2022), and one CEO went so far as claiming that "Employees are a company's greatest asset."[39] Hence, the suggested approach is to abandon the notion that a firm is defined by the ownership of assets, but, instead, that it is a

[36] Not all dynamic models feature informal, self-enforcing contracts. An incomplete list of dynamic models discussed in this survey is: leverage and cash ratios: Falato, Kadyrzhanova, Sim, et al. (2022), see Section 2.2; Labor mobility: Bolton, Wang, and Yang (2019); Chen, Li, Thakor, et al. (2024); Sanati (2025), see Section 3.4; deferred compensation: Sun and Xiaolan (2019), see Section 3.4; power struggles: Bronars and Deere (1991); Perotti and Spier (1993), see Section 3.6; monopsony power in labor markets: Arnold (2020), see Section 4.5; valuation: Belo, Gala, Salomao, et al. (2022), see Sections 2.2 and 5.1; labor leverage and wage rigidity: Danthine and Donaldson (2002), Favilukis and Lin (2016b), see Section 5.2.

[37] The fact that informal relationships that are not governed by formal long-term contracts can also be found outside of firms – Alchian and Demsetz's famous quip that such a relationship can also arise from repeated purchases from the same grocer – is irrelevant for this point. The important question is what separates the status of an employee and that of a contractor.

[38] Baker, Gibbons, and Murphy have developed this paradigm in a series of papers, see Baker, Gibbons, and Murphy (1994); Baker, Gibbons, and Murphy (1999); Baker, Gibbons, and Murphy (2002) and their own overview in Baker, Gibbons, and Murphy (2023).

[39] Attributed to Anne Mulcahy, CEO of Xerox in a speech from 2003 and cited by Regier and Rouen (2023).

venue that permits the repeated interaction between many owners of its inputs. In such a framework, we can distinguish between employment *relationships*, which can be owned by the firm, and *employees*, who can not. The value of human capital as an asset of the firm is then the present value of all quasi rents from its employment relationships. (This is also reflected in the approach of Belo et. al., 2022 discussed in Section 2.1.) The expected duration of employment relationships forms the durability of this asset. Labor mobility is then the rate of depreciation in the sense of perpetual inventory models (see Section 2.1), and positive shocks to labor mobility are impairments of this asset.

Properly reflecting the limited commitment to employment relationships is not only relevant for the analysis of financial and human capital constraints, but also for understanding how it creates additional risks. Informal relationships that are sustained by reputation formed through repeated interactions can easily be disrupted if the outside options and preferences of either firms or employees change. Hence, while firms support the collaboration of the owners of different inputs through relational contracting, this collaboration is necessarily fragile, as each input owner can withdraw their contribution, disrupt operations, and thereby impose costs on the owners of the other inputs. The literature summarized in this survey has amply documented that these risks are reflected in wages when employees charge a risk premium to firms (Section 3), and in stock prices, when investors incorporate the fragility of this collaboration into their valuations (Section 5).

Most of the research surveyed here relies on data from the United States. As such, it originates in a specific institutional environment that is unusual in its tight regulation of financial markets (for example, see the large literature in law and finance, e.g., La Porta, Lopez-De-Silanes, and Shleifer, 2008) and its comparatively loose regulation of labor markets (see, for example, Dessaint, Golubov, and Volpin, 2017; Kim, Maug, and Schneider, 2018). This survey does not attempt to locate the research surveyed here in the institutional and cultural environment from which the data originate, and, given the few studies on European markets – which are heterogeneous within themselves – and the scant research on Asian markets, such an endeavor is probably impossible at this stage. One feature of this survey is the strong role of theory and thus the focus on economic mechanisms, and the hope is that many of the insights on these economic mechanisms will prove to be robust across institutional environments, even though the strengths and the relevance of many effects may still differ across countries and regions. At this stage, these can only be conjectures. Accordingly, one of the challenges for research at the interface of financial economics and labor economics in the years to come should be to explore the impact of different institutional environments and to subject the insights established so far to robust out-of-sample testing.

Another limitation of extant research – and, accordingly, also this survey – is that it takes the perspective of individual firms or of individual employees when analyzing financial contracting and

financial transactions. Thus, it neglects a general equilibrium perspective. All discussions of economic welfare based on these analyses can only be tentative, however, because they neglect externalities. This survey touches on this topic only briefly in the discussion of restrictions to labor mobility in Sections 3.4 and 4.2. Hence, extant research has vastly increased our understanding of how corporate events such as bankruptcies, private equity buyouts, or mergers and acquisitions affect existing employees, or potentially also prospective employees. Yet, researchers rarely, if ever, ask how these transactions affect other economic activities, e.g., how the release of qualified employees may benefit other firms, market entry, or start-up formation (for exceptions, see again Section 4.2). In many ways, the analysis of "creative destruction" mostly emphasizes the "destruction" part and the existing employment relationships and rarely addresses – potentially also for methodological reasons – the "creative" part. However, from the perspective of economic welfare and guiding policies, analyzing this aspect should be equally important.

References

Abowd, John M., and David S. Kaplan, 1999, Executive Compensation: Six Questions that Need Answering, *Journal of Economic Perspectives* 13:4, pp. 145-168.

Abowd, John M., Francis Kramarz, and David N. Margolis, 1999, High Wage Workers and High Wage Firms, *Econometrica* 67:2, pp. 251-333.

Acabbi, Edoardo M, Ettore Panetti, and Alessandro Sforza, 2019, The Financial Channels of Labor Rigidities: Evidence from Portugal, (Gabinete de Estratégia e Estudos, Ministério da Economia).

Acemoglu, Daron, Alex He, and Daniel le Maire, 2025, Eclipse of Rent-Sharing: The Effects of Managers' Business Education on Wages and the Labor Share in the US and Denmark, *NBER Working Paper No. 29874*.

Acharya, Viral, Sergei A. Davydenko, and Ilya A. Strebulaev, 2012, Cash Holdings and Credit Risk, *The Review of Financial Studies* 25:12, pp. 3572-3609.

Acharya, Viral, Marco Pagano, and Paolo F: Volpin, 2016, Seeking Alpha: Excess Risk Taking and Competition for Managerial Talent, *Review of Financial Studies* 29:10, pp. 2565–2599.

Acharya, Viral V., Heitor Almeida, and Murillo Campello, 2007, Is Cash Negative Debt? A Hedging Perspective on Corporate Financial Policies, *Journal of Financial Intermediation* 16:4, pp. 515-554.

Adelino, Manuel, Antoinette Schoar, and Felipe Severino, 2015, House Prices, Collateral, and Self-Employment, *Journal of Financial Economics* 117:2, pp. 288-306.

Adrjan, Pawel, 2018, Risky Business? Earnings Prospects of Employees at Young Firms.

Agarwal, Vikas, Hadiye Aslan, Lixin Huang, and Honglin Ren, 2022, Political Uncertainty and Household Stock Market Participation, *Journal of Financial and Quantitative Analysis* 57:8, pp. 2899-2928.

Aggarwal, Dhruv, Ofer Eldar, Yael V. Hochberg, and Lubomir P. Litov, 2022, The Rise of Dual-Class Stock IPOs, *Journal of Financial Economics* 144:pp. 122-153.

Aghion, Philippe, and Patrick Bolton, 1989, The Financial Structure of the Firm and the Problem of Control, *European Economic Review* 33:pp. 286-293.

Aghion, Philippe, and Patrick Bolton, 1992, An "Incomplete Contract" Approach to Financial Contracting, *Review of Economic Studies* 59:200, pp. 473-494.

Agrawal, Ashwini, Juanita González-Uribe, and Jimmy Martínez-Correa, 2022, Measuring the Ex-Ante Incentive Effects of Creditor Control Rights During Bankruptcy Reorganization, *Journal of Financial Economics* 143:1, pp. 381-408.

Agrawal, Ashwini K., Isaac Hacamo, and Zhongchen Hu, 2021, Information Dispersion Across Employees and Stock Returns, *The Review of Financial Studies* 34:10, pp. 4785-4831.

Agrawal, Ashwini K., and David A. Matsa, 2013, Labor Unemployment Risk and Corporate Financing Decisions, *Journal of Financial Economics* 108:2, pp. 449-470.

Agrawal, Ashwini K., and Prasanna Tambe, 2016, Private Equity and Workers' Career Paths: The Role of Technological Change, *Review of Financial Studies* 29:9, pp. 2455-2489.

Agrawal, Ashwini K., and Prasanna Tambe, 2019, Takeovers and Endogenous Labor Reallocation, *Working Paper, London School of Economics*.

Ahmad, Muhammad Farooq, and Thomas Lambert, 2019, Collective Bargaining and Mergers and Acquisitions Activity Around the World, *Journal of Banking & Finance* 99:pp. 21-44.

Ai, Hengjie, and Anmol Bhandari, 2021, Asset Pricing With Endogenously Uninsurable Tail Risk, *Econometrica* 89:3, pp. 1471-1505.

Akerlof, George A., 1983, Loyalty Filters, *American Economic Review* 73:1, pp. 54-63.

Alchian, Armen A., and Harold Demsetz, 1972, Production, Information Costs and Economic Organization, *American Economic Review* 62:5, pp. 777-795.

Aldatmaz, Serdar, Paige Ouimet, and Edward D. Van Wesep, 2018, The Option to Quit: The Effect of Employee Stock Options on Turnover, *Journal of Financial Economics* 127:1, pp. 136-151.

Alesina, Alberto, Yann Algan, Pierre Cahuc, and Paola Giuliano, 2015, Family Values and the Regulation of Labor, *Journal of the European Economic Association* 13:4, pp. 599-630.

Alexander, Lewis, and Janice Eberly, 2018, Investment Hollowing Out, *IMF Economic Review* 66:pp. 5-30.

Almazan, Andres, Adolfo de Motta, and Sheridan Titman, 2015, Debt, Labor Markets, and the Creation and Destruction of Firms, *Journal of Financial Economics* 118:3, pp. 636-657.

Almeida, Heitor, Murillo Campello, and Dirk Hackbarth, 2011, Liquidity Mergers, *Journal of Financial Economics* 102:3, pp. 526-558.

Almeida, Heitor, Murillo Campello, Bruno Laranjeira, and Scott Weisbenner, 2012, Corporate Debt Maturity and the Real Effects of the 2007 Credit Crisis, *Critical Finance Review* 1:1, pp. 3-58.

Almeida, Heitor, and Thomas Philippon, 2007, The Risk-Adjusted Cost of Financial Distress, *Journal of Finance* 62:6, pp. 2557-2586.

Altman, Edward I., 2007, About Corporate Default Rates, *Salomon Center Special Report, New York University*.

Amess, Kevin, and Mike Wright, 2007, The Wage and Employment Effects of Leveraged Buyouts in the UK, *International Journal of the Economics of Business* 14:2, pp. 179-195.

Aminadav, Gur, and Elias Papaioannou, 2020, Corporate Control Across the World, *Journal of Finance* 75:3, pp. 1191-1246.

Anderson, Ronald C., and David M. Reeb, 2003, Founding-Family Ownership and Firm Performance: Evidence from the S&P 500, *Journal of Finance* 58:3, pp. 1301-1327.

Anderson, Ronald W., 2023, Firms Run by Talented Humans: Shareholder Value or Rent Extraction?, *Working Paper, London School of Economics*.

Andrade, Gregor, Mark Mitchell, and Erik Stafford, 2001, New Evidence and Perspectives on Mergers, *Journal of Economic Perspectives* 15:2, pp. 103-120.

Andres, Christian, Dmitry Bazhutov, Douglas J. Cumming, Gerrit Köchling, et al., 2025, Does Speculative News Hurt Productivity? Evidence from Takeover Rumors, *Journal of Financial and Quantitative Analysis (forthcoming)*.

Antoni, Manfred, Ernst Maug, and Stefan Obernberger, 2019, Private Equity and Human Capital Risk, *Journal of Financial Economics* 133:3, pp. 634-657.

Araujo, Aloisio, Rafael Ferreira, Spyridon Lagaras, Flavio Moraes, et al., 2023, The Labor Effects of Judicial Bias in Bankruptcy, *Journal of Financial Economics (forthcoming)*.

Arnold, David, 2020, Mergers and Acquisitions, Local Labor Market Concentration, and Worker Outcomes, *Working Paper, Princeton University*.

Ashenfelter, Orley C., Henry Farber, and Michael R. Ransom, 2010, Labor Market Monopsony, *Journal of Labor Economics* 28:2, pp. 203-210.

Atanassov, Julian, and E. Han Kim, 2009, Labor and Corporate Governance: International Evidence from Restructuring, *Journal of Finance* 64:1, pp. 341-374.

Atkeson, Andrew, and Patrick J. Kehoe, 2005, Modeling and Measuring Organization Capital, *Journal of Political Economy* 113:5, pp. 1026-1053.

Autor, David, Caroline Chin, Anna Salomons, and Bryan Seegmiller, 2024, New Frontiers: The Origins and Content of New Work, 1940–2018, *The Quarterly Journal of Economics* 139:3, pp. 1399-1465.

Autor, David H., Lawrence F. Katz, and Melissa S. Kearney, 2006, The Polarization of the U.S. Labor Market, *American Economic Review* 96:2, pp. 189-194.

Azar, José, Xin Dai, Yue Qiu, and Aaron Sojourner, 2024, Common Ownership in Labor Markets, *Working Paper, University of Navarra*.

Azariadis, Costas, 1975, Implicit Contracts and Underemployment Equilibria, *Journal of Political Economy* 83:6, pp. 1183-1202.

Babenko, Ilona, 2009, Share Repurchases and Pay-Performance Sensitivity of Employee Compensation Contracts, *Journal of Finance* 64:1, pp. 117-150.

Babina, Tania, 2019, Destructive Creation at Work: How Financial Distress Spurs Entrepreneurship, *The Review of Financial Studies* 33:9, pp. 4061-4101.

Babina, Tania, and Sabrina T. Howell, 2024, Entrepreneurial Spillovers from Corporate R&D, *Journal of Labor Economics* 42:2, pp. 469–509.

Babina, Tania, Wenting Ma, Christian Moser, Paige Ouimet, et al., 2019, Pay, Employment, and Dynamics of Young Firms, *Kenan Institute of Private Enterprise Research Paper No. 19-25*.

Babina, Tania, Wenting Ma, Paige Ouimet, and Rebecca Zarutskie, 2018, Entrepreneurial Wages, *Columbia Business School Research Paper*.

Babina, Tania, Paige Ouimet, and Rebecca Zarutskie, 2025, IPOs, Human Capital, and Labor Reallocation, *Journal of Finacial and Quantitative Analysis (forthcoming)*.

Bach, Laurent, and Nicolas Serrano-Velarde, 2015, CEO Identity and Labor Contracts: Evidence from CEO Transitions, *Journal of Corporate Finance* 33:pp. 227-242.

Bae, Jaewan, and Yu Sung Ha, 2025, Employee Satisfaction, Firm Performance, and Stock Returns: Evidence from the Korean Stock Market, *Pacific-Basin Finance Journal* 93.

Bae, Jaewan, and Jangkoo Kang, 2022, The Negative Hiring Rate Premium on Stock Returns in the Korean Stock Market, *Pacific-Basin Finance Journal* 73:p. 101761.

Bae, Jaewan, and Jangkoo Kang, 2023, Information of Employee Decisions and Stock Returns in the Korean Stock Market, *International Review of Finance* 23:1, pp. 206-224.

Bae, Kee-Hong, Jun-Koo Kang, and Jin Wang, 2011, Employee Treatment and Firm Leverage: A Test of the Stakeholder Theory of Capital Structure, *Journal of Financial Economics* 100:1, pp. 130-153.

Baghai, Ramin P., Rui C. Silva, Viktor Thell, and Vikrant Vig, 2021, Talent in Distressed Firms: Investigating the Labor Costs of Financial Distress, *Journal of Finance* 76:6, pp. 2907-2961.

Bai, John (Jianqiu), Yi Cao, Tyler Hull, Chen Shen, et al., 2024, Labor Demand Similarity and Mergers and Acquisitions: Evidence from 3 Million Job Postings, *Northeastern U. D'Amore-McKim School of Business Research Paper No. 4545044*.

Bai, John (Jianqiu), Massimo Massa, Chi Wan, and Yan Wang, 2022, Local Labor Market Competition and Capital Structure Decisions, *INSEAD Working Paper No. 2022/40/FIN*.

Bai, John, Daniel Carvalho, and Gordon M. Phillips, 2018, The Impact of Bank Credit on Labor Reallocation and Aggregate Industry Productivity, *Journal of Finance* 73:6, pp. 2787-2836.

Bai, John, Eunju Lee, and Chi Zhang, 2020, Capital Market Frictions and Human Capital Investment: Evidence from Workplace Safety Around Regulation SHO, *Financial Review* 55:2, pp. 339-360.

Bai, Yang, Fred Bereskin, Micah S. Officer, and Jing Wang, 2025, The Role of Growth Strategies in Acquisitions, *Working Paper, California State University*.

Baily, Martin Neil, 1974, Wages and Employment Under Uncertain Demand, *Review of Economic Studies* 41:1, pp. 37-50.

Baker, George, Robert Gibbons, and Kevin J. Murphy, 1994, Subjective Performance Measures in Optimal Incentive Contracts, *The Quarterly Journal of Economics* 109:4, pp. 1125-1156.

Baker, George, Michael Gibbs, and Bengt Holmstrom, 1994, The Internal Economics of the Firm: Evidence from Personnel Data, *Quarterly Journal of Economics* 109:4, pp. 881-919.

Baker, George P., Robert Gibbons, and Kevin J. Murphy, 1999, Informal Authority in Organizations, *Journal of Law, Economics, & Organization* 15:1, pp. 56-73.

Baker, George P., Robert Gibbons, and Kevin J. Murphy, 2002, Relational Contracts and the Theory of the Firm, *The Quarterly Journal of Economics* 117:1, pp. 39-84.

Baker, George P., Robert Gibbons, and Kevin J. Murphy, 2023, From Incentives to Control to Adaptation: Exploring Interactions Between Formal and Relational Governance, *Journal of Institutional and Theoretical Economics (JITE)* 3-4, pp. 500-529.

Baldwin, Carliss Y., 1983, Productivity and Labor Unions: An Application of the Theory of Self- Enforcing Contracts, *The Journal of Business* 56:2, pp. 155-185.

Baltrunaite, Audinga, and Egle Karmaziene, 2024, Fast Tracks to Boardrooms: Director Supply and Board Appointments, *Journal of Corporate Finance* 88:p. 102642.

Barkai, Simcha, 2020, Declining Labor and Capital Shares, *The Journal of Finance* 75:5, pp. 2421-2463.

Barrot, Jean-Noël, Thorsten Martin, Julien Sauvagnat, and Boris Vallée, 2024, The Labor Market Effects of Loan Guarantee Programs, *The Review of Financial Studies* 37:8, pp. 2315-2354.

Barry, John W., Murillo Campello, John R. Graham, and Yueran Ma, 2022, Corporate Flexibility in a Time of Crisis, *Journal of Financial Economics* 144:3, pp. 780-806.

Bassanini, Andrea, Thomas Breda, Eve Caroli, and Antoine Rebérioux, 2013, Working in Family Firms: Paid Less but More Secure? Evidence from French Matched Employer-Employee Data, *Industrial Labor Relations Review* 66:2, pp. 433-466.

Bates, Thomas W., Kathleen M. Kahle, and René M. Stulz, 2009, Why Do U.S. Firms Hold So Much More Cash Than They Used To?, *The Journal of Finance* 64:5, pp. 1985-2021.

Baù, Massimo, Johan Karlsson, Kajsa Haag, Daniel Pittino, et al., 2024, Employee Layoffs in Times of Crisis: Do Family Firms Differ?, *Entrepreneurship & Regional Development* 36:5-6, pp. 722–744.

Beaumont, Paul, Camille Hebert, and Victor Lyonnet, 2025, Build or Buy? Human Capital and Corporate Diversification, *The Review of Financial Studies* 38:5, pp. 1333-1367.

Bebchuk, Lucian Arye, K. J. Martijn Cremers, and Urs C. Peyer, 2011, The CEO Pay Slice, *Journal of Financial Economics* 102:1, pp. 199-221.

Beck, Thorsten, Ross Levine, and Norman Loayza, 2000, Finance and the Sources of Growth, *Journal of Financial Economics* 58:1, pp. 261-300.

Begenau, Juliane, and Berardino Palazzo, 2021, Firm Selection and Corporate Cash Holdings, *Journal of Financial Economics* 139:3, pp. 697-718.

Begley, Taylor A., Peter H. Haslag, and Daniel Weagley, 2025, Directing the Labor Market: The Impact of Shared Board Members on Employee Flows, *Olin Business School Center for Finance & Accounting Research Paper No. 2024/20*.

Belo, Frederico, Vito D. Gala, Juliana Salomao, and Maria Ana Vitorino, 2022, Decomposing Firm Value, *Journal of Financial Economics* 143:2, pp. 619-639.

Belo, Frederico, Jun Li, Xiaoji Lin, and Xiaofei Zhao, 2017, Labor-Force Heterogeneity and Asset Prices: The Importance of Skilled Labor, *Review of Financial Studies* 30:10, pp. 3669-3709.

Belo, Frederico, Xiaoji Lin, and Santiago Bazdresch, 2014, Labor Hiring, Investment, and Stock Return Predictability in the Cross Section, *Journal of Political Economy* 122:1, pp. 129--177.

Belot, Francois, and Edith Ginglinger, 2025, Family Businesses and Labor Relations, *ECGI Finance Working Paper* 1039/2025.

Ben-David, Itzhak, Utpal Bhattacharya , Ruidi Huang, and Stacey E. Jacobsen, 2025, The (Missing) Relation Between Announcement Returns and Value Creation, *Journal of Finance (forthcoming)*.

Bena, Jan, and Kai Li, 2014, Corporate Innovations and Mergers and Acquisitions, *Journal of Finance* 69:5, pp. 1923-1960.

Bender, Stefan, Nicholas Bloom, David Card, John Van Reenen, et al., 2018, Management Practices, Workforce Selection, and Productivity, *Journal of Labor Economics* 36:S1, pp. S371-S409.

Benmelech, Efraim, Nittai K. Bergman, and Ricardo J. Enriquez, 2012, Negotiating with Labor Under Financial Distress, *Review of Corporate Finance Studies* 1:1, pp. 28-67.

Benmelech, Efraim, Nittai K. Bergman, and Hyunseob Kim, 2022, Strong Employers and Weak Employees: How Does Employer Concentration Affect Wages?, *Journal of Human Resources* 57:S, pp. S200-S250.

Benmelech, Efraim, Nittai Bergman, and Amit Seru, 2021, Financing Labor, *Review of Finance* 25:5, pp. 1365-1393.

Benmelech, Efraim, Carola Frydman, and Dimitris Papanikolaou, 2019, Financial Frictions and Employment During the Great Depression, *Journal of Financial Economics* 133:3, pp. 541-563.

Benmelech, Efraim, Nitish Kumar, and Raghuram G. Rajan, 2024, The Decline of Secured Debt, *Journal of Finance* 79:1, pp. 35-93.

Bens, Daniel A., Venky Nagar, Douglas J. Skinner, and Franco M.H. Wong, 2003, Employee Stock Options, EPS Dilution, and Stock Repurchases, *Journal of Accounting and Economics* 36:1, pp. 51-90.

Berger, Allen N., and Gregory F. Udell, 1998, The Economics of Small Business Finance: The Roles of Private Equity and Debt Markets in the Financial Growth Cycle, *Journal of Banking & Finance* 22:6, pp. 613-673.

Berk, Jonathan B., Richard Stanton, and Josef Zechner, 2010, Human Capital, Bankruptcy, and Capital Structure, *Journal of Finance* 65:3, pp. 891-926.

Berk, Jonathan B., and Johan Walden, 2013, Limited Capital Market Participation and Human Capital Risk, *Review of Asset Pricing Studies* 3:1, pp. 1-37.

Bernstein, Shai, 2015, Does Going Public Affect Innovation?, *Journal of Finance* 70:4, pp. 1365-1403.

Bernstein, Shai, Arthur G. Korteweg, and Kevin Laws, 2017, Attracting Early-Stage Investors: Evidence from a Randomized Field Experiment, *Journal of Finance* 72:2, pp. 509-538.

Bernstein, Shai, and Albert Sheen, 2016, The Operational Consequences of Private Equity Buyouts: Evidence from the Restaurant Industry, *Review of Financial Studies* 29:9, pp. 2387-2418.

Bernstein, Shai, Richard R Townsend, and Ting Xu, 2024, Flight to Safety: How Economic Downturns Affect Talent Flows to Startups, *The Review of Financial Studies* 37:3, pp. 837-881.

Bertrand, Marianne, and Sendhil Mullainathan, 2003, Enjoying the Quiet Life? Corporate Governance and Managerial Preferences, *Journal of Political Economy* 111:5, pp. 1043-1075.

Bertrand, Marianne, and Antoinette Schoar, 2003, Managing with Style: The Effect of Managers on Firm Policies, *Quarterly Journal of Economics* 118:4, pp. 1169–1208.

Bertrand, Marianne, and Antoinette Schoar, 2006, The Role of Family in Family Firms, *Journal of Economic Perspectives* 20:2, pp. 73-96.

Betermier, Sebastien, Thomas Jansson, Christine Parlour, and Johan Walden, 2012, Hedging Labor Income Risk, *Journal of Financial Economics* 105:3, pp. 622-639.

Betton, Sandra, B. Espen Eckbo, and Karin S. Thorburn, 2008, Corporate Takeovers, in B. Espen Eckbo, ed.: *Chapter 15 in: Handbook of Corporate Finance: Empirical Corporate Finance* (Elsevier/North-Holland), pp. 291-430.

Bhagat, Sanjay, Andrei Shleifer, and Robert Vishny, 1990, Hostile Takeovers in the 1980's: The Return to Corporate Specialization, *Brookings Papers on Economic Activity; Microeconomics* pp. 1-84.

Bhojraj, Sanjeev, Youngki Jang, David Weinbaum, and Nir Yehuda, 2024, Labor Leverage and Debt Contract Provisions, *Working Paper, Cornell University*.

Bias, Daniel, 2021, Illiquid Equity, Labor Mobility, and Talent Allocation, *Working Paper, Swedish House of Finance*.

Bias, Daniel, Benjamin Lochner, Stefan Obernberger, and Merih Sevilir, 2025, Going Public and the Internal Organization of the Firm, *Journal of Finance (forthcoming)*.

Blair, Margaret M., 1999, Firm-Specific Human Capital and Theories of the Firm, in Margaret M. Blair, and Mark J. Roe, eds.: *Employees and Corporate Governance* (Brookings Institution Press).

Blair, Margaret M., and Mark J. Roe, *Employees and Corporate Governance* (Brookings Institution Press, 1999).

Blandhol, Christine, Magne Mogstad, Peter Nilsson, and Ola L. Vestad, 2025, Who Benefits from Worker Representation on Corporate Boards?, *NBER Working Paper No. 28269*.

Bloom, Nicholas, Luis Garicano, Raffaella Sadun, and John Van Reenen, 2014, The Distinct Effects of Information Technology and Communication Technology on Firm Organization, *Management Science* 60:12, pp. 2859-2885.

Bloom, Nicholas, Raffaella Sadun, and John Van Reenen, 2009, Do Private Equity Owned Firms Have Better Management Practices?, *Center for Economic Performance Occasional Paper No. 24*.

Bloom, Nicholas, Raffaella Sadun, and John Van Reenen, 2015, Do Private Equity Owned Firms Have Better Management Practices?, *American Economic Review* 105:5, pp. 442-46.

Bloom, Nicholas, and John Van Reenen, 2007, Measuring and Explaining Management Practices Across Firms and Countries, *Quarterly Journal of Economics* 122:4, pp. 1351-1408.

Bloom, Nicholas, and John Van Reenen, 2010, Why Do Management Practices Differ Across Firms and Countries?, *Journal of Economic Perspectives* 24:1, pp. 203-24.

Boal, William M., and Michael R. Ransom, 1997, Monopsony in the Labor Market, *Journal of Economic Literature* 35:1, pp. 86-112.

Boguth, Oliver, David Newton, and Mikhail Simutin, 2022, The Fragility of Organization Capital, *Journal of Financial and Quantitative Analysis* 57:3, pp. 857-887.

Bolton, Patrick, Neng Wang, and Jinqiang Yang, 2019, Optimal Contracting, Corporate Finance, and Valuation with Inalienable Human Capital, *The Journal of Finance* 74:3, pp. 1363-1429.

Bonaparte, Yosef, George M. Korniotis, and Alok Kumar, 2014, Income Hedging and Portfolio Decisions, *Journal of Financial Economics* 113:2, pp. 300-324.

Boot, Arnoud W. A., Radhakrishnan Gopalan, and Ajan V. Thakor, 2006, The Entrepreneur's Choice Between Private and Public Ownership, *Journal of Finance* 61:2, pp. 803-836.

Boot, Arnoud W. A., Radhakrishnan Gopalan, and Anjan V. Thakor, 2008, Market Liquidity, Investor Participation, and Managerial Autonomy: Why Do Firms Go Private?, *Journal of Finance* 63:4, pp. 2013-2059.

Booth, Laurence David, and Jun Zhou, 2013, Increase in Cash Holdings: Pervasive or Sector-Specific?, 10:2, pp. 31-62.

Borisov, Alexander, Andrew Ellul, and Merih Sevilir, 2021, Access to Public Capital Markets and Employment Growth, *Journal of Financial Economics* 141:3, pp. 896-918.

Børsting, Christa, and Steen Thomsen, 2017, Foundation Ownership, Reputation, and Labour, *Oxford Review of Economic Policy* 33:2, pp. 317–338.

Boucly, Quentin, David Sraer, and David Thesmar, 2011, Growth LBOs, *Journal of Financial Economics* 102:2, pp. 432-453.

Brau, James C., and Stanley E. Fawcett, 2006, Initial Public Offerings: An Analysis of Theory and Practice, *The Journal of Finance* 61:1, pp. 399-436.

Brav, Alon, Wei Jiang, and Hyunseob Kim, 2015, The Real Effects of Hedge Fund Activism: Productivity, Asset Allocation, and Labor Outcomes, *Review of Financial Studies*.

Breitling, Frank, Julia Dhar, Ruth Ebeling, and Deborah Lovich, 2021, 6 Strategies to Boost Retention Through the Great Resignation, *Harvard Business Review*.

Bronars, Stephen G., and Donald R. Deere, 1991, The Threat of Unionization, the Use of Debt, and the Preservation of Shareholder Wealth, *Quarterly Journal of Economics* 106:1, pp. 231-254.

Brown, Charles, and James L. Medoff, 2003, Firm Age and Wages, *Journal of Labor Economics* 21:3, pp. 677-697.

Brown, Jennifer, and David A. Matsa, 2016, Boarding a Sinking Ship? An Investigation of Job Applications to Distressed Firms, *Journal of Finance* 71:2, pp. 507-550.

Bruhn, Miriam, Dean Karlan, and Antoinette Schoar, 2010, What Capital Is Missing in Developing Countries?, *American Economic Review* 100:2, pp. 629–33.

Buchanan, Bonnie, and Caglar Kaya, 2024, Foundation Ownership and Creditor Governance: Evidence from Publicly Listed Companies, *Journal of International Financial Markets, Institutions and Money* 93.

Burdín, Gabriel, and Andrés Dean, 2009, New Evidence on Wages and Employment in Worker Cooperatives Compared with Capitalist Firms, *Journal of Comparative Economics* 37:4, pp. 517-533.

Burton, M. Diane, Michael S. Dahl, and Olav Sorenson, 2018, Do Start-ups Pay Less?, *ILR Review* 71:5, pp. 1179-1200.

Bushee, Brian J., 1998, The Influence of Institutional Investors on Myopic R&D Investment Behavior, *The Accounting Review* 73:3, pp. 305-333.

Caggese, Andrea, and Vicente Cuñat, 2008, Financing Constraints and Fixed-term Employment Contracts, *The Economic Journal* 118:533, pp. 2013-2046.

Caggese, Andrea, Vicente Cuñat, and Daniel Metzger, 2019, Firing the Wrong Workers: Financing Constraints and Labor Misallocation, *Journal of Financial Economics* 133:3, pp. 589-607.

Calvo, Guillermo A., Fabrizio Coricelli, and Pablo Ottonello, 2025, Labor Market, Financial Crises and Inflation: Jobless and Wageless Recoveries, *NBER Working Paper No. 18480*.

Campbell, John Y., 1996, Understanding Risk and Return, *Journal of Political Economy* 104:2, pp. 298-345.

Campbell, John Y., and Robert J. Shiller, 1988, The Dividend-Price Ratio and Expectations of Future Dividends and Discount Factors, *The Review of Financial Studies* 1:3, pp. 195-228.

Campbell, John Y., and Tuomo Vuolteenaho, 2004, Bad Beta, Good Beta, *American Economic Review* 94:5, pp. 1249-1275.

Campello, Murillo, Gaurav Kankanhalli, and Pradeep Muthukrishnan, 2024, Corporate Hiring Under COVID-19: Financial Constraints and the Nature of New Jobs, *Journal of Financial and Quantitative Analysis* 59:4, pp. 1541 - 1585.

Carlin, Bruce Ian, Bhagwan Chowdhry, and Mark J. Garmaise, 2012, Investment in Organization Capital, *Journal of Financial Intermediation* 21:2, pp. 268-286.

Celikyurt, Ugur, Merih Sevilir, and Anil Shivdasani, 2010, Going Public to Acquire? The Acquisition Motive in IPOs, *Journal of Financial Economics* 96:3, pp. 345-363.

Chan, Louis K. C., Josef Lakonishok, and Theodore Sougiannis, 2001, The Stock Market Valuation of Research and Development Expenditures, *The Journal of Finance* 56:6, pp. 2431-2456.

Chaplinsky, Susan, and Greg Niehaus, 1994, The Role of ESOPs in Takeover Contests, *Journal of Finance* 49:4, pp. 1451-1470.

Chaplinsky, Susan, Greg Niehaus, and Linda Van de Gucht, 1998, Employee Buyouts: Causes, Structure, and Consequences, *Journal of Financial Economics* 48:3, pp. 283-332.

Chava, Sudheer, András Danis, and Alex Hsu, 2020, The Economic Impact of Right-to-Work Laws: Evidence from Collective Bargaining Agreements and Corporate Policies, *Journal of Financial Economics* 137:2, pp. 451-469.

Chemla, Gilles, 2005, Hold-Up, Stakeholders and Takeover Threats, *Journal of Financial Intermediation* 14:3, pp. 376-397.

Chemmanur, Thomas J., Yingmei Cheng, and Tianming Zhang, 2013, Human Capital, Capital Structure, and Employee Pay: An Empirical Analysis, *Journal of Financial Economics* 110:2, pp. 478-502.

Chemmanur, Thomas J., and Paolo Fulghieri, 1999, A Theory of the Going-Public Decision, *Review of Financial Studies* 12:2, pp. 249-279.

Chen, AJ, Miao Ben Zhang, and Zhao Zhang, 2025, Talent Market Competition and Firm Growth, *Working Paper, University of Southern California*.

Chen, Alvin, 2024, Firm Performance Pay as Insurance Against Promotion Risk, *The Journal of Finance* 79:5, pp. 3497-3541.

Chen, Alvin, 2025, Encouraging Employee Engagement: The Role of Equity Pay, *Working Paper, Stockholm School of Economics*.

Chen, Deqiu, Huasheng Gao, and Yujing Ma, 2021, Human Capital-Driven Acquisition: Evidence from the Inevitable Disclosure Doctrine, *Management Science* 67:8, pp. 4643-4664.

Chen, Huafeng, Marcin Kacperczyk, and Hernán Ortiz-Molina, 2012, Do Nonfinancial Stakeholders Affect the Pricing of Risky Debt? Evidence from Unionized Workers, *Review of Finance* 16:2, pp. 347-383.

Chen, Huafeng, Marcin T. Kacperczyk, and Hernan Ortiz-Molina, 2011, Labor Unions, Operating Flexibility, and the Cost of Equity, *Journal of Financial and Quantitative Analysis* 46:1, pp. 25-58.

Chen, Jun, Shenje Hshieh, and Feng Zhang, 2021, The Role of High-Skilled Foreign Labor in Startup Performance: Evidence from Two Natural Experiments, *Journal of Financial Economics*.

Chen, Jun, Shenje Hshieh, and Feng Zhang, 2024, Hiring High-Skilled Labor Through Mergers and Acquisitions, *Journal of Financial and Quantitative Analysis* 59:6, pp. 2762-2798.

Chen, Yuchen, Xuelin Li, Richard T. Thakor, and Colin Ward, 2024, Appropriated Growth, *Working Paper, University of Minnesota*.

Chen, Zhihong, Yuan Huang, and K. C. John Wei, 2013, Executive Pay Disparity and the Cost of Equity Capital, *Journal of Financial and Quantitative Analysis* 48:3, pp. 849-885.

Chodorow-Reich, Gabriel, 2014, The Employment Effects of Credit Market Disruptions: Firm-level Evidence from the 2008–9 Financial Crisis, *Quarterly Journal of Economics* 129:1, pp. 1-59.

Choi, Bong-Geun, Jung Ho Choi, and Sara Malik, 2023, Not Just for Investors: The Role of Earnings Announcements in Guiding Job Seekers, *Journal of Accounting and Economics* 76:1, p. 101588.

Choi, Woon Gyu, and David E. Cook, 2024, Jobs as Collateral: Employment Dynamics, *Working Paper, HKUST*.

Chowdhury, Rajib, and John A. Doukas, 2022, Protection of Trade Secrets and Value of Cash Holdings: Evidence From a Natural Experiment, *Journal of Banking & Finance* 143:p. 106617.

Chung, Ji-Woong, 2011, Leveraged Buyouts of Private Companies, *Working Paper, Korea University*.
Cicero, David C., Mo Shen, and Jaideep Shenoy, 2025, Corporate M&As and Labor Market Concentration: Efficiency Gains or Power Grabs?, *Journal of Finance (forthcoming)*.
Clifford, Christopher P., and William Christopher Gerken, 2021, Property Rights to Client Relationships and Financial Advisor Incentives, *Journal of Finance* 76:5, pp. 2409-2445.
Cohn, Jonathan B., Nicole Nestoriak, and Malcolm Wardlaw, 2021, Private Equity Buyouts and Workplace Safety, *Review of Financial Studies*.
Cohn, Jonathan B., and Malcolm I. Wardlaw, 2016, Financing Constraints and Workplace Safety, *Journal of Finance* 71:5, pp. 2017-2058.
Coraggio, Luca, Marco Pagano, Annalisa Scognamiglio, and Joacim Tåg, 2025, JAQ of All Trades: Job Mismatch, Firm Productivity and Managerial Quality, *Journal of Financial Economics* 164:p. 103992.
Core, Fabrizio, Gosia Ryduchowska, and Su Wang, 2024, Human Capital Acquisition in VC-Backed Companies, *Working Paper, Luiss Guido Carli University*.
Core, John E., Wayne R. Guay, and David F. Larcker, 2003, Executive Equity Compensation and Incentives: A Survey, *Economic Policy Review* 9:8, pp. 27-50.
Corrado, Carol A., Daniel E. Sichel, and Charles R. Hulten, 2005, Measuring Capital and Technology: An Expanded Framework, in Carol A. Corrado, John Haltiwanger, and Daniel E. Sichel, eds.: *Measuring Capital in the New Economy* (Chicago, Ill.).
Corrado, Carol, Jonathan Haskel, Cecilia Jona-Lasinio, and Massimiliano Iommi, 2022, Intangible Capital and Modern Economies, *Journal of Economic Perspectives* 36:3, pp. 3-28.
Corrado, Carol, Charles Hulten, and Daniel Sichel, 2009, Intangible Capital and U.S. Economic Growth, *Review of Income and Wealth* 55:3, pp. 661-685.
Cressy, Robert, Federico Munari, and Alessandro Malipiero, 2008, Creative Destruction? UK Evidence That Buyouts Cut Jobs to Raise Returns, *Venture Capital: An International Journal of Entrepreneurial Finance* 13:1, pp. 1-23.
Cronqvist, Henrik, Fredrik Heyman, Mattias Nilsson, Helena Svaleryd, et al., 2009, Do Entrenched Managers Pay Their Workers More?, *Journal of Finance* 64:1, pp. 309-339.
Crouzet, Nicolas, Janice C. Eberly, Andrea L. Eisfeldt, and Dimitris Papanikolaou, 2022, The Economics of Intangible Capital, *Journal of Economic Perspectives* 36:3, pp. 29-52.
Cumming, Douglas J., Marc Deloof, Sophie Manigart, and Mike Wright, 2019, New Directions in Entrepreneurial Finance, *Journal of Banking & Finance* 100:pp. 252-260.
Cumming, Douglas J., and Alexander Peter Groh, 2018, Entrepreneurial Finance: Unifying Themes and Future Directions, *Journal of Corporate Finance* 50:pp. 538-555.
Cumming, Douglas J., Donald S. Siegel, and Mike Wright, 2007, Private Equity, Leveraged Buyouts and Governance, *Journal of Corporate Finance* 13:4, pp. 439-460.
Dang, Viet A., Amedeo De Cesari, and Hieu V. Phan, 2021, Employment Protection and Share Repurchases: Evidence from Wrongful Discharge Laws, *Journal of Corporate Finance* 69.
Danthine, Jean-Pierre, and John B. Donaldson, 2002, Labour Relations and Asset Returns, *The Review of Economic Studies* 69:1, pp. 41-64.
Dasgupta, Sudipto, and Kunal Sengupta, 1993, Sunk Investment, Bargaining and Choice of Capital Structure, *International Economic Review* 34:1, pp. 203-20.
Davis, Steven J., John C. Haltiwanger, Kyle Handley, Ron Jarmin, et al., 2014, Private Equity, Jobs, and Productivity, *American Economic Review* 104:12, pp. 3956-90.
Davydova, Daria, Rüdiger Fahlenbrach, Leandro Sanz, and René M. Stulz, 2024, Why Do Startups Become Unicorns Instead of Going Public?, *ECGI Finance Working Paper* 857/2022.
De la Parra, Daniela, and Stephen Glaeser, 2025, Measuring Labor Market Competition at the Firm Level and an Application to Innovation Production, *Working Paper, UNC Chapel Hill*.
DeAngelo, Harry, and Linda DeAngelo, 1990, Dividend Policy and Financial Distress: An Empirical Investigation of Troubled NYSE Firms, *Journal of Finance* 45:5, pp. 1415-1431.

DeAngelo, Harry, Linda DeAngelo, and René M. Stulz, 2006, Dividend Policy and the Earned/Contributed Capital Mix: A Test of the Life-Cycle Theory, *Journal of Financial Economics* 81:2, pp. 227-254.

Degeorge, Francois, and Richard Zeckhauser, 1993, The Reverse LBO Decision and Firm Performance: Theory and Evidence, *Journal of Finance* 48:4, pp. 1323-1348.

deHaan, Ed., Nan Li, and Frank S. Zhou, 2023, Financial Reporting and Employee Job Search, *Journal of Accounting Research* 61:2, pp. 571-617.

Dell'Ariccia, Giovanni, Dalida Kadyrzhanova, Camelia Minoiu, and Lev Ratnovski, 2020, Bank Lending in the Knowledge Economy, *Review of Financial Studies* 34:10, pp. 5036-5076.

Demiroglu, Cem, and Christopher James, 2011, The Use of Bank Lines of Credit in Corporate Liquidity Management: A Review of Empirical Evidence, *Journal of Banking & Finance* 35:4, pp. 775-782.

Denes, Matthew R., Jonathan M. Karpoff, and Victoria B. McWilliams, 2017, Thirty Years of Shareholder Activism: A Survey of Empirical Research, *Journal of Corporate Finance* 44:pp. 405-424.

Dessaint, Olivier, Andrey Golubov, and Paolo F: Volpin, 2017, Employment Protection and Takeovers, *Journal of Financial Economics* 125:2, pp. 369-388.

Dhillon, Upinder S., and Gabriel G. Ramírez, 1994, Employee Stock Ownership and Corporate Control: An Empirical Study, *Journal of Banking & Finance* 18:1, pp. 9-25.

Di Addario, Sabrina Lucia, Vincenzo Pezone, and Raffaele Saggio, 2023, Managerial Horizon and Corporate Labor Policies: Evidence from Fixed-Term Boards, *Working Paper, Bank of Italy*.

Di Porto, Edoardo, Marco Pagano, Vincenzo Pezone, Raffaele Saggio, et al., 2024, Careers and Wages in Family Firms: Evidence from Matched Employer-Employee Data, *ECGI Finance Working Paper No. 1022/2024*.

Diamond, Douglas W., 1991, Monitoring and Reputation: The Choice Between Bank Loans and Directly Placed Debt, *Journal of Political Economy* 99:4, pp. 689-721.

Dickinson, Victoria, 2011, Cash Flow Patterns as a Proxy for Firm Life Cycle, *The Accounting Review* 86:6, pp. 1969-1994.

Dittmann, Ingolf, Maurizio Montone, and Yuhao Zhu, 2023, Wage Gap and Stock Returns: Do Investors Dislike Pay Inequality?, *Journal of Corporate Finance* 78:p. 102322.

Dobbelaere, Sabien, Grace McCormack, Daniel Prinz, and Sandor Sovago, 2022, Firm Consolidation and Labor Market Outcomes, *IZA Discussion Paper No. 15724*.

Doidge, Craig, G. Andrew Karolyi, and René M. Stulz, 2017, The U.S. Listing Gap, *Journal of Financial Economics* 123:3, pp. 464-487.

Donangelo, Andres, 2014, Labor Mobility: Implications for Asset Pricing, *Journal of Finance* 69:3, pp. 1321–1346.

Donangelo, Andres, François Gourio, Matthias Kehrig, and Miguel Palacios, 2019, The Cross-Section of Labor Leverage and Equity Returns, *Journal of Financial Economics* 132:2, pp. 497-518.

Dore, Timothy E, and Rebecca Zarutskie, 2022, When Does Higher Firm Leverage Lead to Higher Employee Pay?, *The Review of Corporate Finance Studies* 12:1, pp. 36-77.

Döttling, Robin, Tomislav Ladika, and Enrico C. Perotti, 2025, Creating Intangible Capital, *Working Paper, University of Amsterdam*.

Döttling, Robin, and Enrico C. Perotti, 2020, Secular Trends and Technological Progress, *Working Paper, Erasmus University*.

Dou, Winston Wei, Yan Ji, David Reibstein, and Wei Wu, 2021, Inalienable Customer Capital, Corporate Liquidity, and Stock Returns, *The Journal of Finance* 76:1, pp. 211-265.

Dow, Gregory K., 2018, The Theory of the Labor-Managed Firm: Past, Present, and Future, *Annals of Public and Cooperative Economics* 89:1, pp. 65-86.

Duygan-Bump, Burcu, Alexey Levkov, and Judit Montoriol-Garriga, 2015, Financing Constraints and Unemployment: Evidence from the Great Recession, *Journal of Monetary Economics* 75:pp. 89-105.

Eckbo, B. Espen, Andrey Malenko, and Karin S. Thorburn, 2025, Corporate Takeovers: Theory and Evidence, *ECGI Finance Working Paper* 41/2025.

Eckbo, B. Espen, and Karin S. Thorburn, 2013, Corporate Restructuring, *Foundations and Trends in Finance* 7:3, pp. 159-288.

Edmans, Alex, 2009, Blockholder Trading, Market Efficiency, and Managerial Myopia, *Journal of Finance* 64:6, pp. 2481-2513.

Edmans, Alex, 2011, Does the Stock Market Fully Value Intangibles? Employee Satisfaction and Equity Prices, *Journal of Financial Economics* 101:3, pp. 621-640.

Edmans, Alex, and Xavier Gabaix, 2016, Executive Compensation: A Modern Primer, *Journal of Economic Literature* 54:4, pp. 1232-87.

Edmans, Alex, Lucius Li, Darcy Pu, and Chendi Zhang, 2024, Employee Satisfaction, Labor Market Flexibility, and Stock Returns Around the World, *Management Science* 70:7, pp. 4357-4380.

Eiling, Esther, 2013, Industry-Specific Human Capital, Idiosyncratic Risk, and the Cross-Section of Expected Stock Returns, *Journal of Finance* 68:1, pp. 43-84.

Eiling, Esther, Frank De Jong, Roger J. A. Laeven, and Rob C. Sperna Weiland, 2025, Medium-Run Labor Income Risk, *Working Paper, University of Amsterdam*.

Eisfeldt, Andrea L., Antonio Falato, Dongryeol Lee, and Mindy Z. Xiaolan, 2023, Equity Pay Beyond the C-Suite, *Working Paper, University of California at Los Angeles*.

Eisfeldt, Andrea L., Antonio Falato, and Mindy Z. Xiaolan, 2023, Human Capitalists, *NBER Macroeconomics Annual* 37:pp. 1-61.

Eisfeldt, Andrea L., and Dimitris Papanikolaou, 2013, Organization Capital and the Cross-Section of Expected Returns, *Journal of Finance* 68:4, pp. 1365-1406.

Eisfeldt, Andrea L., and Dimitris Papanikolaou, 2014, The Value and Ownership of Intangible Capital, *American Economic Review* 104:5, pp. 189-94.

Eisfeldt, Andrea L., and Adriano A. Rampini, 2007, New or Used? Investment with Credit Constraints, *Journal of Monetary Economics* 54:8, pp. 2656-2681.

ElFayoumi, Khalid, 2020, Firm Financing and the Relative Demand for Labor and Capital, *DIW Berlin Discussion Paper No. 1908*.

Elkamhi, Redouane, Daniel Kim, and Marco Salerno, 2024, How Large Are Predefault Costs of Financial Distress? Estimates from a Dynamic Model, *Management Science* 70:11, pp. 7373-7396.

Ellul, Andrew, and Marco Pagano, 2019, Corporate Leverage and Employees' Rights in Bankruptcy, *Journal of Financial Economics* 133:3, pp. 685-707.

Ellul, Andrew, Marco Pagano, and Fabiano Schivardi, 2018, Employment and Wage Insurance within Firms: Worldwide Evidence, *Review of Financial Studies* 31:4, pp. 1298-1340.

Erel, Isil, Yeejin Jang, and Michael S. Weisbach, 2015, Do Acquisitions Relieve Target Firms' Financial Constraints?, *Journal of Finance* 70:1, pp. 289-328.

Ersahin, Nuri, and Rustom M Irani, 2018, Collateral Shocks and Corporate Employment, *Review of Finance* 24:1, pp. 163-187.

Estrin, Saul, Jan Hanousek, Evzen Kocenda, and Jan Svejnar, 2009, The Effects of Privatization and Ownership in Transition Economies, *Journal of Economic Literature* 47:3, pp. 699–728.

Ewens, Michael, and Joan Farre-Mensa, 2020, The Deregulation of the Private Equity Markets and the Decline in IPOs, *The Review of Financial Studies* 33:12, pp. 5463-5509.

Ewens, Michael, and Joan Farre-Mensa, 2022, Private or Public Equity? The Evolving Entrepreneurial Finance Landscape, *Annual Review of Financial Economics* 14:1, pp. 271-293.

Ewens, Michael, and Xavier Giroud, 2025, Corporate Hierarchy, *National Bureau of Economic Research Working Paper Series No. 34162*.

Ewens, Michael, and Nadya Malenko, 2024, Board Dynamics Over the Startup Life Cycle, *ECGI Finance Working Paper No. 687/2020*.

Ewens, Michael, and Matt Marx, 2017, Founder Replacement and Startup Performance, *The Review of Financial Studies* 31:4, pp. 1532-1565.

Ewens, Michael, Ryan H. Peters, and Sean Wang, 2025, Measuring Intangible Capital with Market Prices, *Management Science* 71:1.

Faccio, Mara, and William J. O'Brien, 2021, Business Groups and Employment, *Management Science* 67:6, pp. 3468-3491.

Falato, Antonio, Dalida Kadyrzhanova, Jae Sim, and Roberto Steri, 2022, Rising Intangible Capital, Shrinking Debt Capacity, and the US Corporate Savings Glut, *Journal of Finance* 77:5, pp. 2799-2852.

Falato, Antonio, Hyunseob Kim, and Till Von Wachter, 2022, Shareholder Power and the Decline of Labor, *Working Paper, Boards of Governors of the Federal Reserve System*.

Falato, Antonio, and Nellie Liang, 2016, Do Creditor Rights Increase Employment Risk? Evidence from Loan Covenants, *Journal of Finance* 71:6, pp. 2545-2590.

Faleye, Olubunmi, Vikas Mehrotra, and Randall Morck, 2006, When Labor has a Voice in Corporate Governance, *Journal of Financial and Quantitative Analysis* 41:3, pp. 489-510.

Fama, Eugene F., and Kenneth R. French, 1993, Common Risk Factors in the Returns of Stocks and Bonds, *Journal of Financial Economics* 33:1, pp. 3-55.

Fama, Eugene F., and Michael C. Jensen, 1983, Agency Problems and Residual Claims, *Journal of Law and Economics* 26:2, pp. 327-349.

Farber, Henry S., and Kevin F. Hallock, 2009, The Changing Relationship Between Job Loss Announcements and Stock Prices: 1970–1999, *Labour Economics* 16:1, pp. 1-11.

Farre-Mensa, Joan, Roni Michaely, and Martin Schmalz, 2014, Payout Policy, *Annual Review of Financial Economics* 6:1, pp. 75-134.

Favilukis, Jack, and Xiaoji Lin, 2016a, Does Wage Rigidity Make Firms Riskier? Evidence from Long-Horizon Return Predictability, *Journal of Monetary Economics* 78:pp. 80-95.

Favilukis, Jack, and Xiaoji Lin, 2016b, Wage Rigidity: A Quantitative Solution to Several Asset Pricing Puzzles, *Review of Financial Studies* 29:1, pp. 148–192.

Favilukis, Jack, Xiaoji Lin, and Xiaofei Zhao, 2020, The Elephant in the Room: The Impact of Labor Obligations on Credit Markets, *American Economic Review* 110:6, pp. 1673-1712.

Fedyk, Anastassia, and James Hodson, 2023, Trading on Talent: Human Capital and Firm Performance, *Review of Finance* 27:5, pp. 1659-1698.

Fenn, George W., and Nellie Liang, 2001, Corporate Payout Policy and Managerial Stock Incentives, *Journal of Financial Economics* 60:1, pp. 45-72.

Ferreira, Daniel, Gustavo Manso, and André C. Silva, 2014, Incentives to Innovate and the Decision to Go Public or Private, *Review of Financial Studies* 27:1, pp. 256–300.

Ferreira, Daniel, and Radoslawa Nikolowa, 2022, Talent Discovery and Poaching Under Asymmetric Information, *The Economic Journal* 133:649, pp. 201-234.

Ferreira, Daniel, and Radoslawa Nikolowa, 2024, Prestige, Promotion, and Pay, *Journal of Finance* 79:1, pp. 505-540.

Field, Laura Casares, and Michelle Lowry, 2022, Bucking the Trend: Why do IPOs Choose Controversial Governance Structures and Why Do Investors Let Them, *Journal of Financial Economics* 146:1, pp. 27-54.

Fornell, Claes, Sunil Mithas, Forrest V. Morgeson, and M.S. Krishnan, 2006, Customer Satisfaction and Stock Prices: High Returns, Low Risk, *Journal of Marketing* 70:1, pp. 3-14.

Frydman, Carola, and Dirk Jenter, 2010, CEO Compensation, *Annual Review of Financial Economics* 2:pp. 75-102.

Fu, Fangjian, Sheng Huang, and Rong Wang, 2022, Why Do U.S. Firms Invest Less over Time?, *Journal of Empirical Finance* 69:pp. 15-42.

Gamba, Andrea, and Alexander J. Triantis, 2008, The Value of Financial Flexibility, *The Journal of Finance* 63:5, pp. 2263-2296.

Gamber, Edward N., 1988, Long-Term Risk-Sharing Wage Contracts in an Economy Subject to Permanent and Temporary Shocks, *Journal of Labor Economics* 6:1, pp. 83-99.

Gao, Janet, Wenyu Wang, and Xiaoyun Yu, 2024, Big Fish in Small Ponds: Human Capital Migration and the Rise of Boutique Banks, *Management Science* 70:11, pp. 7829-7850.

García-Gómez, Pilar, Ernst Maug, and Stefan Obernberger, 2025, Private Equity Buyouts and Employee Health, *Management Science (forthcoming) No. 680/2020*.

Gardberg, Malin, Fredrik Heyman, and Joacim Tåg, 2023, Importing Automation and Wage Inequality Through Foreign Acquisitions, *IFN Working Paper* 1457.

Garmaise, Mark J., 2008, Production in Entrepreneurial Firms: The Effects of Financial Constraints on Labor and Capital, *The Review of Financial Studies* 21:2, pp. 543-577.

Garvey, Gerald, and Noel Gaston, 2009, Getting Tough with Workers: More on the Strategic Role of Debt, in Dipak R. Basu, ed.: *Advances in Development Economics* (World Scientific, Singapore), pp. 87-106.

Garvey, Gerald T., and Noel Gaston, 1997, A Theory of the Optimal Cost Barrier to Corporate Takeovers, *International Economic Review* 38:3, pp. 657-675.

Gaston, Noel, 1997, Efficiency Wages, Managerial Discretion, and the Fear of Bankruptcy, *Journal of Economic Behavior & Organization* 33:1, pp. 41-59.

Gebhardt, William R., Charles M. C. Lee, and Bhaskaran Swaminathan, 2001, Towards an Implied Cost of Capital, *Journal of Accounting Reserach* 39:pp. 135-175.

Gehrke, Britta, Ernst Maug, Stefan Obernberger, and Christoph Schneider, 2025, Post-merger Restructuring of the Labor Force, *ECGI - Finance Working Paper No. 753/2021*.

Ghaly, Mohamed, Viet Anh Dang, and Konstantinos Stathopoulos, 2015, Cash Holdings and Employee Welfare, *Journal of Corporate Finance* 33:pp. 53-70.

Ghaly, Mohamed, Viet Anh Dang, and Konstantinos Stathopoulos, 2017, Cash Holdings and Labor Heterogeneity: The Role of Skilled Labor, *Review of Financial Studies* 30:10, pp. 3636-3668.

Gibbons, Robert, 2005, Four Formal(izable) Theories of the Firm?, *Journal of Economic Behavior & Organization* 58:2, pp. 200-245.

Giroud, Xavier, and Holger M. Mueller, 2015, Capital and Labor Reallocation Within Firms, *Journal of Finance* 70:4, pp. 1767-1804.

Giroud, Xavier, and Holger M. Mueller, 2017, Firm Leverage, Consumer Demand, and Employment Losses During the Great Recession, *Quarterly Journal of Economics* 132:1, pp. 271-316.

Goergen, Marc, Noel O'Sullivan, and Geoffrey Wood, 2014, The Employment Consequences of Private Equity Acquisitions: The Case of Institutional Buy Outs, *European Economic Review* 71:0, pp. 67-79.

Gómez, Juan-Pedro, Richard Priestley, and Fernando Zapatero, 2016, Labor Income, Relative Wealth Concerns, and the Cross Section of Stock Returns, *Journal of Financial and Quantitative Analysis* 51:4, pp. 1111-1133.

Gompers, Paul, Josh Lerner, and David Scharfstein, 2005, Entrepreneurial Spawning: Public Corporations and the Genesis of New Ventures, 1986 to 1999, *The Journal of Finance* 60:2, pp. 577-614.

Goos, Maarten, and Alan Manning, 2007, Lousy and Lovely Jobs: The Rising Polarization of Work in Britain, *Review of Economics and Statistics* 89:1, pp. 118-133.

Gopalan, Radhakrishnan, Sheng Huang, and Johan Maharjan, 2021, The Role of Deferred Pay in Retaining Managerial Talent, *Working Paper, Washington University*.

Gordon, Lilli A., and L. Pound, 1990, ESOPs and Corporate Control, *Journal of Financial Economics* 27:pp. 525-556.

Gornall, Will, Oleg Gredil, Sabrina T Howell, Xing Liu, et al., 2024, Do Employees Cheer for Private Equity? The Heterogeneous Effects of Buyouts on Job Quality, *Management Science* 71:5, pp. 4287-4317.

Gortmaker, Jeff, Jessica S. Jeffers, and Michael Lee, 2022, Labor Reactions to Credit Deterioration: Evidence from LinkedIn Activity, *Working Paper, HEC Paris*.

Gorton, Gary B., and Frank A. Schmid, 2004, Capital, Labor, and The Firm: A Study of German Codetermination, *Journal of the European Economic Association* 2:5, pp. 863-905.

Goshen, Zohar, and Assaf Hamdani, 2015, Corporate Control and Idiosyncratic Vision, *Yale LJ* 125:p. 560.

Goshen, Zohar, and Doron Levit, 2025, Common Ownership and Hedge Fund Activism: An Unholy Alliance?, *ECGI Finance Working Paper* 982/2024.

Graham, John R, and Mark T Leary, 2018, The Evolution of Corporate Cash, *The Review of Financial Studies* 31:11, pp. 4288-4344.

Graham, John R., 2000, How Big Are the Tax Benefits of Debt?, *Journal of Finance* 55:5, pp. 1901-1941.

Graham, John R., Campbell R. Harvey, and Manju Puri, 2013, Managerial Attitudes and Corporate Actions, *Journal of Financial Economics* 109:1, pp. 103-121.
Graham, John R., Hyunseob Kim, Si Li, and Jiaping Qiu, 2023, Employee Costs of Corporate Bankruptcy, *Journal of Finance* 78:4, pp. 2087-2137.
Grossman, Sanford J., and Oliver D. Hart, 1981, Implicit Contracts, Moral Hazard, and Unemployment, *American Economic Review* 71:2, pp. 301-307.
Groysberg, Boris, Linda-Eling Lee, and Ashish Nanda, 2008, Can They Take It with Them? The Portability of Star Knowledge Workers' Performance, *Management Science* 54:7, pp. 1213-1230.
Gruber, Joseph, and Steven B. Kamin, 2015, The Corporate Saving Glut in the Aftermath of the Global Financial Crisis, *International Finance Discussion Papers No. 1150*.
Guenzel, Marius, Clint Hamilton, and Ulrike Malmendier, 2023, CEO Social Preferences and Layoffs, *Working Paper, University of Pennsylvania*.
Guenzel, Marius, and Ulrike Malmendier, 2020, Behavioral Corporate Finance: The Life Cycle of a CEO Career, *NBER Working Paper*.
Guiso, Luigi, Luigi Pistaferri, and Fabiano Schivardi, 2005, Insurance Within the Firm, *Journal of Political Economy* 113:5, pp. 1054-1087.
Guiso, Luigi, Luigi Pistaferri, and Fabiano Schivardi, 2013, Credit Within the Firm, *Review of Economic Studies* 80:1, pp. 211-247.
Guiso, Luigi, Paola Sapienza, and Luigi Zingales, 2015, The Value of Corporate Culture, *Journal of Financial Economics* 117:1, pp. 60-76.
Gutiérrez, Germán, and Thomas Philippon, 2017, Investmentless Growth: An Empirical Investigation, *Brookings Papers on Economic Activity* pp. 89-169.
Haidt, Jonathan, 2007, The New Synthesis in Moral Psychology, 316:5827, pp. 998-1002.
Haidt, Jonathan, *The Righteous Mind* (Pantheon Books, New York, 2012).
Hallock, Kevin F., 1998, Layoffs, Top Executive Pay, and Firm Performance, *American Economic Review* 88:4, pp. 711-723.
Hallock, Kevin F., 2009, Job Loss and the Fraying of the Implicit Employment Contract, *Journal of Economic Perspectives* 23:4, pp. 69-93.
Hanka, Gordon, 1998, Debt and the Terms of Employment, *Journal of Financial Economics* 48:3, pp. 245-282.
Harford, Jarrad, 2024, Chapter 10: Merger Waves: A Survey of the Literature, in David J. Denis, ed.: *Handbook of Corporate Finance* (Edward Elgar Publishing), pp. 377-409.
Harris, Milton, and Bengt Holmstrom, 1982, A Theory of Wage Dynamics, *Review of Economic Studies* 49:3, pp. 315-333.
Harris, Richard, Donald S. Siegel, and Mike Wright, 2005, Assessing the Impact of Management Buyouts on Economic Efficiency: Plant-Level Evidence from the United Kingdom, *Review of Economics and Statistics* 87:1, pp. 148-153.
Hart, Oliver D., and John Moore, 1994, A Theory of Debt Based on the Inalienability of Human Capital, *Quarterly Journal of Economics* 109:4, pp. 841-879.
Hasan, Iftekhar, Stefano Manfredonia, and Yukun Liu, 2024, Corporate Moral Values, *Working Paper, Fordham University*.
Hasan, Mostafa Monzur, and Adrian Cheung, 2018, Organization Capital and Firm Life Cycle, *Journal of Corporate Finance* 48:pp. 556-578.
He, Alex Xi, and Daniel le Maire, 2022, Mergers and Managers: Manager-Specific Wage Premiums and Rent Extraction in M&As, *Working Paper, MIT*.
He, Alex Xi, and Jing Xue, 2025, Monopolizing Minds: How M&As Stifle Innovation Through Labor Market Power, *Working Paper, University of Maryland*.
He, Bianca, 2025, Financing Intangibles, *Working Paper, University of Chicago*.
Heaton, John, and Deborah J. Lucas, 1996, Evaluating the Effects of Incomplete Markets on Risk Sharing and Asset Pricing, *Journal of Political Economy* 104:3, pp. 443-487.
Hellmann, Thomas, and Manju Puri, 2002, Venture Capital and the Professionalization of Start-Up Firms: Empirical Evidence, *The Journal of Finance* 57:1, pp. 169-197.

Hellwig, Martin, 2000, On the Economics and Politics of Corporate Finance and Corporate Control, in Xavier Vives, ed.: *Corporate Governance: Theoretical and Empirical Perspectives* (Cambridge University Press, Cambridge), pp. 95-134.

Herkenhoff, Kyle F., Josh Lerner, Gordon M. Phillips, Francisca Rebelo, et al., 2025, Private Equity and Workers: Modeling and Measuring Monopsony, Implicit Contracts, and Efficient Reallocation, *NBER Working Paper* No. 33942.

Hoffmann, Florian, and Vladimir Vladimirov, 2025, Worker Runs, *The Journal of Finance* 80:2, pp. 937-979.

Holmstrom, Bengt, and Steven N. Kaplan, 2001, Corporate Governance and Merger Activity in the United States: Making Sense of the 1980s and 1990s, *Journal of Economic Perspectives* 15:2, pp. 121-14.

Hong, Harrison, and Jeremy C. Stein, 1999, A Unified Theory of Underreaction, Momentum Trading, and Overreaction in Asset Markets, *Journal of Finance* 54:6, pp. 2143-2184.

Hotchkiss, Edith Shwalb, 1995, Postbankruptcy Performance and Management Turnover, *The Journal of Finance* 50:1, pp. 3-21.

Hou, Kewei, Chen Xue, and Lu Zhang, 2014, Digesting Anomalies: An Investment Approach, *The Review of Financial Studies* 28:3, pp. 650-705.

Howell, Sabrina T., and J. David Brown, 2022, Do Cash Windfalls Affect Wages? Evidence from R&D Grants to Small Firms, *The Review of Financial Studies* 36:5, pp. 1889-1929.

Hu, Qing, Ross Levine, Chen Lin, and Mingzhu Tai, 2022, Mentally Spent: Credit Conditions and Mental Health, *NBER Working Paper No. 25584*.

Huang, Minjie, Pingshu Li, Felix Meschke, and James Guthrie, 2015, Family Firms, Employee Satisfaction, and Corporate Performance, *Journal of Corporate Finance* 34:pp. 108-127.

Huitfeldt, Ingrid, Andreas R. Kostøl, Jan Nimczik, and Andrea Weber, 2022, Internal labor markets: A worker flow approach, *Journal of Econometrics*.

Israelsen, Ryan D., and Scott E. Yonker, 2017, Key Human Capital, *Journal of Financial and Quantitative Analysis* 52:1, pp. 175-214.

Jagannathan, Ravi, and Zhenyu Wang, 1996, The Conditional CAPM and the Cross-Section of Expected Returns, *Journal of Finance* 51:1, pp. 3-53.

Jäger, Simon, Joerg Heining, and Nathan Lazarus, 2022, How Substitutable are Workers? Evidence from Worker Deaths, *NBER Working Paper* 30629.

Jäger, Simon, Shakked Noy, and Benjamin Schoefer, 2022, The German Model of Industrial Relations: Balancing Flexibility and Collective Action, *Journal of Economic Perspectives* 36:4, pp. 53-80.

Jäger, Simon, Christopher Roth, Nina Roussille, and Benjamin Schoefer, 2024, Worker Beliefs About Outside Options, *The Quarterly Journal of Economics* 139:3, pp. 1505-1556.

Jäger, Simon, Benjamin Schoefer, and Jörg Heining, 2020, Labor in the Boardroom, *The Quarterly Journal of Economics* 136:2, pp. 669-725.

Jaggia, Priscilla Butt, and Anjan V. Thakor, 1994, Firm-Specific Human Capital and Optimal Capital Structure, *International Economic Review* 35:2, pp. 283-308.

Jaravel, Xavier, Neviana Petkova, and Alex Bell, 2018, Team-Specific Capital and Innovation, *American Economic Review* 108:4-5, pp. 1034–73.

Jayaratne, Jith, and Philip E. Strahan, 1996, The Finance-Growth Nexus: Evidence from Bank Branch Deregulation, *Quarterly Journal of Economics* 111:3, pp. 639-670.

Jeffers, Jessica S., 2024, The Impact of Restricting Labor Mobility on Corporate Investment and Entrepreneurship, *The Review of Financial Studies* 37:1, pp. 1-44.

Jensen, Michael C., and William H. Meckling, 1976, Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure, *Journal of Financial Economics* 3:4, pp. 305-360.

Jermann, Urban, and Vincenzo Quadrini, 2012, Macroeconomic Effects of Financial Shocks, *American Economic Review* 102:1, pp. 238-71.

John, Kose, Anzhela Knyazeva, and Diana Knyazeva, 2015, Employee Rights and Acquisitions, *Journal of Financial Economics* 118:1, pp. 49-69.

Jordà, Òscar, Moritz Schularick, and Alan M. Taylor, 2016, The Great Mortgaging: Housing Finance, Crises and Business Cycles, *Economic Policy* 31:85, pp. 107-152.
Jovanovic, Boyan, 1982, Selection and the Evolution of Industry, *Econometrica* 50:3, pp. 649-670.
Kahle, Kathleen M., and René M. Stulz, 2017, Is the US Public Corporation in Trouble?, *Journal of Economic Perspectives* 31:3, pp. 67-88.
Kaplan, Steven N., 1989, The Effects of Management Buyouts on Operating Performance and Value, *Journal of Financial Economics* 24:2, pp. 217-254.
Kaplan, Steven N., Mark M. Klebanov, and Morten Sorensen, 2012, Which CEO Characteristics and Abilities Matter?, *Journal of Finance* 67:3, pp. 973-1007.
Kaplan, Steven N., Berk A. Sensoy, and Per Strömberg, 2009, Should Investors Bet on the Jockey or the Horse? Evidence from the Evolution of Firms from Early Business Plans to Public Companies, *The Journal of Finance* 64:1, pp. 75-115.
Kaplan, Steven N., and Per Strömberg, 2009, Leveraged Buyouts and Private Equity, *Journal of Economic Perspectives* 23:1, pp. 121-146.
Kárpáti, Dániel, and Luc Renneboog, 2023, Corporate Financial Frictions and Employee Mental Health, *Journal of Financial and Quantitative Analysis* pp. 1-67.
Kenney, Martin, Donald Patton, and Jay R. Ritter, 2012, Post-IPO Employment and Revenue Growth for U.S. IPOs, June 1996-2010, *Working Paper, University of California, Davis*.
Kieback, Sascha, Cristi A. Gleason, Martin Thomsen, and Christoph Watrin, 2025, The Information Environment of Firms with Worker Representation on Corporate Board, *Working Paper, University of Münster*.
Kim, E Han, Yuan Li, Yao Lu, and Xinzheng Shi, 2024, External Financing, Technological Changes, and Employees, *Review of Finance* 28:3, pp. 985-1025.
Kim, E. Han, Ernst Maug, and Christoph Schneider, 2018, Labor Representation in Governance as an Insurance Mechanism, *Review of Finance* 22:4, pp. 1251-1289.
Kim, E. Han, and Paige Ouimet, 2014, Broad-Based Employee Stock Ownership: Motives and Outcomes, *Journal of Finance* 69:3, pp. 1273–1319.
Kim, Hyunseob, 2020, How Does Labor Market Size Affect Firm Capital Structure? Evidence from Large Plant Openings, *Journal of Financial Economics* 138:1, pp. 277-294.
Kim, J. Daniel, 2020, Startup Acquisitions as a Hiring Strategy: Worker Choice and Turnover, *Academy of Management Proceedings* 2020:1, p. 12959.
Kisgen, Darren J., Lei Kong, and Xudong Fu, 2025, Corporate Share Repurchase Policies and Labor Share, *Working Paper, Boston College*.
Kiyotaki, Nobuhiro, and John Moore, 1997, Credit Cycles, *Journal of Political Economy* 105:2, pp. 211-248.
Klasa, Sandy, William F. Maxwell, and Hernán Ortiz-Molina, 2009, The Strategic Use of Corporate Cash Holdings in Collective Bargaining with Labor Unions, *Journal of Financial Economics* 92:3, pp. 421-442.
Klasa, Sandy, Hernán Ortiz-Molina, Matthew Serfling, and Shweta Srinivasan, 2018, Protection of Trade Secrets and Capital Structure Decisions, *Journal of Financial Economics* 128:2, pp. 266-286.
Kline, Patrick, 2024, Chapter 2 - Firm Wage Effects, in Christian Dustmann, and Thomas Lemieux, eds.: *Handbook of Labor Economics* (Elsevier), pp. 115-181.
Koptyug, Nikita, Lars Persson, and Joacim Tåg, 2020, Should We Worry About the Decline of the Public Corporation? A Brief Survey of the Economics and External Effects of the Stock Market, *The North American Journal of Economics and Finance* 51:p. 101061.
Kraus, Alan, and Robert H. Litzenberger, 1973, A State-Preference Model of Optimal Financial Leverage, *Journal of Finance* 28:4, pp. 911-922.
Kundu, Santanu, and Clemens Mueller, 2024, Angels and Demons: The Negative Effect of Employees' Angel Investments on Corporate Innovation, *Working Paper, University of Mannheim*.
Kuzmina, Olga, 2023, Employment Flexibility and Capital Structure: Evidence from a Natural Experiment, *Management Science* 69:9, pp. 4992-5017.

La Porta, Rafael, Florencio Lopez-De-Silanes, and Andrei Shleifer, 2008, The Economic Consequences of Legal Origins, *Journal of Economic Literature* 46:2, pp. 285-332.
La Porta, Rafael, Florencio Lopez-de-Silanes, Andrei Shleifer, and Robert Vishny, 1999, Corporate Ownership Around the World, *Journal of Finance* 54:2, pp. 471-517.
Lagaras, Spyridon, 2021, Corporate Takeovers and Labor Restructuring, *Working Paper, University of Pittsburgh*.
Lagaras, Spyridon, 2023, M&As, Employee Costs and Labor Reallocation, *Journal of Finance (forthcoming)*.
Lakkis, Emil, 2023, Human Capital and IPO Timing, *Working Paper, University of Michigan*.
Lambert, Marie, Nicolas Moreno, Ludovic Phalippou, and Alexandre Scivoletto, 2021, Employee Views of Leveraged Buy-Out Transactions, *Working Paper, University of Liège*.
Lambert, Richard A., William N. Lanen, and David F. Larcker, 1989, Executive Stock Option Plans and Corporate Dividend Policy, *Journal of Financial and Quantitative Analysis* 24:4, pp. 409-425.
Lattanzio, Gabriele, Lubomir P. Litov, William L. Megginson, and Alina Munteanu, 2023, Capitalizing Entrepreneurship: The Rise of Growth Equity, *Journal of Applied Corporate Finance* 35:2, pp. 75-89.
Lattanzio, Gabriele, William L. Megginson, and Ali Sanati, 2023, Dissecting the Listing Gap: Mergers, Private Equity, or Regulation?, *Journal of Financial Markets* 65:pp. 1008-36.
Lazear, Edward P., 2004, Output-Based Pay: Incentives, Retention or Sorting?, in Solomon W. Polachek, ed.: *Accounting for Worker Well-Being* (Emerald Group Publishing Limited), pp. 1-25.
Lazear, Edward P., 2009, Firm-Specific Human Capital: A Skill-Weights Approach, *Journal of Political Economy* 117:5, pp. 914-940.
Lee, Dong Wook, Hyun-Han Shin, and René Stulz, 2022, Why Does Capital No Longer Flow More to the Industries with the Best Growth Opportunities?, *NBER Working Paper No. 22924*.
Lee, Kyeong Hun (Kyle), David C. Mauer, and Qianying (Emma) Xu, 2018, Human Capital Relatedness and Mergers and Acquisitions, *Journal of Financial Economics* 129:1, pp. 111-135.
Levine, Oliver, 2017, Acquiring Growth, *Journal of Financial Economics* 126:2, pp. 300-319.
Levine, Ross, Chen Lin, and Beibei Shen, 2020, Cross-border Acquisitions: Do Labor Regulations Affect Acquirer Returns?, *Journal of International Business Studies* 51:2, pp. 194-217.
Li, Kai, Buhui Qiu, and Rui Shen, 2018, Organization Capital and Mergers and Acquisitions, *Journal of Financial and Quantitative Analysis* 53:4, pp. 1871-1909.
Li, Kai, and Jin Wang, 2023, Inter-Firm Inventor Collaboration and Path-Breaking Innovation: Evidence From Inventor Teams Post-Merger, *Journal of Financial and Quantitative Analysis* 58:3, pp. 1144-1171.
Li, Tongxia, Tze Chuan 'Chewie' Ang, and Chun Lu, 2023, Employment Protection and the Provision of Trade Credit, *Journal of Banking and Finance* 155.
Lichtenberg, Frank R., and Donald Siegel, 1990a, The Effect of Ownership Changes on the Employment and Wages of Central Office and Other Personnel, *Journal of Law & Economics* 33:2, pp. 383-408.
Lichtenberg, Frank R., and Donald Siegel, 1990b, The Effects of Leveraged Buyouts on Productivity and Related Aspects of Firm Behavior, *Journal of Financial Economics* 27:1, pp. 165-194.
Liebeskind, Julia, Wiersema Margarethe, and Gary Hansen, 1992, LBOs, Corporate Restructuring, and the Incentive-Intensity Hypothesis, *Financial Management* 21:1, pp. 73-88.
Lin, Chen, Thomas Schmid, and Yang Sun, 2019, Conflict or Collusion?: How Employees in the Boardroom Affect Executive Compensation, *Working Paper, University of Hong Kong*.
Lin, Chen, Thomas Schmid, and Yuhai Xuan, 2018, Employee Representation and Financial Leverage, *Journal of Financial Economics* 127:2, pp. 303-324.
Liu, Yanguang, 2025, Robots, Labour Market Frictions and Corporate Financial Policy, *European Financial Management* 31:3, pp. 975-994.
Liu, YunGuo, Minghui Zheng, Yue Xu, and Sujuan Xie, 2023, Deleveraging for Talents: Human Capital Reliance and Corporate Leverage, *Accounting & Finance* 63:5, pp. 4823-4847.

Lowry, Michelle, 2024, Chapter 13: The Blurring Lines Between Private and Public Ownership, in David J. Denis, ed.: *Handbook of Corporate Finance* (Edward Elgar Publishing), pp. 479-510.

Lowry, Michelle, Roni Michaely, and Ekaterina Volkova, 2017, Initial Public Offerings: A Synthesis of the Literature and Directions for Future Research, *Foundations and Trends in Finance* 11:3-4, pp. 154-320.

Lu, Yao, and Zhang Peng, 2022, Labor Market Mobility: An External Governance Mechanism, *Working Paper, Tsinghua University*.

Lustig, Hanno, Stijn Van Nieuwerburgh, and Adrien Verdelhan, 2013, The Wealth-Consumption Ratio, *The Review of Asset Pricing Studies* 3:1, pp. 38-94.

Ma, Song, Wenyu Wang, and Yufeng Wu, 2024, Steering Labor Mobility Through Innovation, *Fisher College of Business Working Paper* 2023-03-029.

Ma, Wenting, Paige Parker Ouimet, and Elena Simintzi, 2025, Mergers and Acquisitions, Technological Change, and Inequality, *Journal of Financial Economics* 172.

Maksimovic, Vojislav, and Liu Yang, 2024, What Do Unions Do? Incentives and Investments, *Working Paper, University of Maryland*.

Malcomson, James M., 1983, Trade Unions and Economic Efficiency, *Ecoonomic Journal* 93:Supplement, pp. 51-65.

Malmendier, Ulrike, Geoffrey Tate, and J. O. N. Yan, 2011, Overconfidence and Early-Life Experiences: The Effect of Managerial Traits on Corporate Financial Policies, *Journal of Finance* 66:5, pp. 1687-1733.

Mann, William, 2018, Creditor Rights and Innovation: Evidence from Patent Collateral, *Journal of Financial Economics* 130:1, pp. 25-47.

Manning, Alan, *Monopsony in Motion: Imperfect Competition in Labor Markets* (Princeton University Press, Princeton, 2003).

Marciukaityte, Dalia, 2024, Labor Unions and Workplace Safety, *Working Paper, Illinois State University*.

Martynova, Marina, and Luc Renneboog, 2006, Mergers and Acquisitions in Europe, in Piet Duffhues, and Luc Renneboog, eds.: *Advances in Corporate Finance and Asset Pricing* (Emerald Publishing Group).

Martynova, Marina, and Luc Renneboog, 2008, A Century of Corporate Takeovers: What Have We Learned and Where Do We Stand?, *Journal of Banking & Finance* 32:10, pp. 2148-2177.

Marx, Matt, Deborah Strumsky, and Lee Fleming, 2009, Mobility, Skills, and the Michigan Non-Compete Experiment, *Management Science* 55:6, pp. 875-889.

Masulis, Ronald W., Cong Wang, and Fei Xie, 2020, Employee-Manager Alliances and Shareholder Returns from Acquisitions, *Journal of Financial and Quantitative Analysis* 55:2, pp. 473-516.

Matsa, David A., 2010, Capital Structure as a Strategic Variable: Evidence from Collective Bargaining, *Journal of Finance* 65:3, pp. 1197-1232.

Matsa, David A., 2018, Capital Structure and a Firm's Workforce, *Annual Review of Financial Economics* 10:pp. 387-412.

McGaughey, Ewan, 2016, The Codetermination Bargains: The History of German Corporate and Labour Law, *Columbia Journal of European Law* 23:1.

Megginson, William L., 2017, Privatization, State Capitalism, and State Ownership of Business in the 21st Century, *Foundations and Trends in Finance* 11:1-2, pp. 1-153.

Merz, Monika, and Eran Yashiv, 2007, Labor and the Market Value of the Firm, *American Economic Review* 97:4, pp. 1419-1431.

Meulbroek, Lisa K., 2005, Company Stock in Pension Plans: How Costly Is It?, *The Journal of Law and Economics* 48:2, pp. 443-474.

Michaels, Ryan, T Beau Page, and Toni M Whited, 2019, Labor and Capital Dynamics Under Financing Frictions, *Review of Finance* 23:2, pp. 279-323.

Michelacci, Claudio, and Vincenzo Quadrini, 2005, Borrowing from Employees: Wage Dynamics with Financial Constraints, *Journal of the European Economic Association* 3:2/3, pp. 360-369.

Michelacci, Claudio, and Vincenzo Quadrini, 2009, Financial Markets and Wages, *Review of Economic Studies* 76:2, pp. 795-827.

Milanez, Anna, 2012, The Human Capital Costs of Financial Constraint, *Working Paper, Harvard Business School*.

Monacelli, Tommaso, Vincenzo Quadrini, and Antonella Trigari, 2023, Financial Markets and Unemployment, *Journal of Financial Economics* 147:3, pp. 596-626.

Moon, S. Katie, and Gordon M. Phillips, 2017, Outside Purchase Contracts, Human Capital and Firm Capital Structure, *NBER Working Paper No. 20579*.

Moore, John, 1992, The Firm as a Collection of Assets, *European Economic Review* 36:2, pp. 493-507.

Mueller, Holger M., and Thomas Philippon, 2011, Family Firms and Labor Relations, *American Economic Journal: Macroeconomics* 3:2, pp. 218-245.

Muscarella, Chris J., and Michael R. Vetsuypens, 1989, The Underpricing of "Second" Initial Public Offerings, *Journal of Financial Research* 12:3, pp. 183-192.

Muscarella, Chris J., and Michael R. Vetsuypens, 1990, Efficiency and Organizational Structure: A Study of Reverse LBOs, *Journal of Finance* 45:5, pp. 1389-1413.

Myers, Brett W., and Alessio Saretto, 2016, Does Capital Structure Affect the Behavior of Nonfinancial Stakeholders? An Empirical Investigation into Leverage and Union Strikes, *Management Science* 62:11, pp. 3235-3253.

Myers, Stewart C., 1977, Determinants of Corporate Borrowing, *Journal of Financial Economics* 5:5, pp. 147-175.

Neffke, Frank, and Martin Henning, 2013, Skill Relatedness and Firm Diversification, *Strategic Management Journal* 34:3, pp. 297-316.

Nguyen, Justin Hung, and Buhui Qiu, 2022, The Effect of Skilled Labor Intensity on Corporate Dividend Payouts, *Journal of Business Finance & Accounting* 49:5-6, pp. 963-1010.

Nishesh, Naman, Paige Ouimet, and Elena Simintzi, 2022, Labor and Finance, in David J Denis, ed.: *Handbook of Corporate Finance*.

Niu, Xu, 2024, The Battle Between Activist Hedge Funds and Labor Unions, *Journal of Empirical Finance* 78:p. 101502.

Oi, Walter Y., 1962, Labor as a Quasi-Fixed Factor, *Journal of Political Economy* 70:6, pp. 538-555.

Olsson, Martin, and Joacim Tåg, 2017, Private Equity, Layoffs, and Job Polarization, *Journal of Labor Economics* 35:3, pp. 697-754.

Olsson, Martin, and Joacim Tåg, 2025a, From Wall Street to Work Floor: How Private Equity Buyouts Affect Workers, in Brian Broughman , and Elisabeth De Fontenay eds.: *Research Handbook on the Structure of Private Equity and Venture Capital (forthcoming)* (Edward Elgar).

Olsson, Martin, and Joacim Tåg, 2025b, What Is the Cost of Privatization for Workers?, *The Journal of Finance* 80:4, pp. 2107-2151.

Opler, Tim, Lee Pinkowitz, Rene M. Stulz, and Rohan Williamson, 1999, The Determinants and Implications of Corporate Cash Holdings, *Journal of Financial Economics* 52:1, pp. 3-46.

Ouimet, Paige P., and Rebecca Zarutskie, 2014, Who Works for Startups? The Relation Between Firm Age, Employee Age, and Growth, *Journal of Financial Economics* 112:3, pp. 386-407.

Ouimet, Paige P., and Rebecca Zarutskie, 2020, Acquiring Labor, *Quarterly Journal of Finance* 10:3, pp. 205001:1-38.

Oyer, Paul, 2004, Why Do Firms Use Incentives that Have No Incentive Effects?, *Journal of Finance* 59:4, pp. 1619-1650.

Oyer, Paul, and Scott Schaefer, 2005, Why Do Some Firms Give Stock Options to All Employees?: An Empirical Examination of Alternative Theories, *Journal of Financial Economics* 76:1, pp. 99-132.

Öztekin, Özde, 2024, Threats to Human Capital: The Effect of Health Risk on Corporate Financial Policy, *Journal of Financial Research* 47:4, pp. 1165-1206.

Pagano, Marco, 2020, Risk Sharing Within the Firm: A Primer, *Foundations and Trends in Finance* 12:2, pp. 117–198.

Pagano, Marco, and Paolo F. Volpin, 2005, Managers, Workers, and Corporate Control, *Journal of Finance* 60:2, pp. 841-868.

Pagano, Marco, and Paolo F. Volpin, 2008, Labor and Finance, *Working Paper, London Business School*.
Palacios, Miguel, 2015, Human Capital as an Asset Class Implications from a General Equilibrium Model, *Review of Financial Studies* 28:4, pp. 978-1023.
Paul, Urbashee, 2022, Unanticipated Effects of Trump's High-Skilled Immigration Policies on Multinational Firms, *Working Paper, Northeastern University*.
Pedersen, David J., 2021, Financial Distress and the Cost of Labor: Evidence from a Natural Experiment, *Review of Financial Economics* 39:3, pp. 280-289.
Peek, Joe, and Eric S. Rosengren, 2000, Collateral Damage: Effects of the Japanese Bank Crisis on Real Activity in the United States, *American Economic Review* 90:1, pp. 30-45.
Pencavel, John, Luigi Pistaferri, and Fabiano Schivardi, 2006, Wages, Employment, and Capital in Capitalist and Worker-Owned Firms, *ILR Review* 60:1, pp. 23-44.
Peng, Mike W., and Yi Jiang, 2010, Institutions Behind Family Ownership and Control in Large Firms, *Journal of Management Studies* 47:2, pp. 253-273.
Penrose, Edith Tilton, *The Theory of the Growth of the Firm* (Wiley, New York,, 1959).
Perotti, Enrico C., and Kathryn E. Spier, 1993, Capital Structure as a Bargaining Tool: The Role of Leverage in Contract Renegotiation, *American Economic Review* 83:5, pp. 1131-1141.
Peters, Ryan H., and Lucian A. Taylor, 2017, Intangible Capital and the Investment-Q Relation, *Journal of Financial Economics* 123:2, pp. 251-272.
Pinkowitz, Lee, René M. Stulz, and Rohan Williamson, 2016, Do U.S. Firms Hold More Cash than Foreign Firms Do?, *Review of Financial Studies* 29:2, pp. 309–348.
Polsky, Gregg D, and John F Coyle, 2013, Acqui-hiring, *Duke Law Journal* 63:pp. 281-346.
Pontiff, Jeffrey, Andrei Shleifer, and Michael S. Weisbach, 1990, Reversions of Excess Pension Assets after Takeovers, *The RAND Journal of Economics* 21:4, pp. 600-613.
Prager, Elena, and Matt Schmitt, 2021, Employer Consolidation and Wages: Evidence from Hospitals, *American Economic Review* 111:2, pp. 397-427.
Prescott, Edward C., and Michael Visscher, 1980, Organization Capital, *Journal of Political Economy* 88:3, pp. 446-461.
Qiu, Jiaping, and Yue Zhang, 2024, Wage Rigidity and Debt Financing: Evidence from Labor Contract Renewal During the Financial Crisis, *Working Paper, McMaster University*.
Rajan, Raghuram G., 2012, Presidential Address: The Corporation in Finance, *Journal of Finance* 67:4, pp. 1173-1217.
Rajan, Raghuram G., and Luigi Zingales, 2001, The Firm as a Dedicated Hierarchy: A Theory of the Origins and Growth of Firms, *Quarterly Journal of Economics* 116:3, pp. 805-851.
Rampini, Adriano A., and S. Viswanathan, 2013, Collateral and Capital Structure, *Journal of Financial Economics* 109:2, pp. 466-492.
Rau, Raghavendra, 2017, Executive Compensation, *Foundations and Trends in Finance* 10:3-4, pp. 181-362.
Rauh, Joshua D., 2006, Own Company Stock in Defined Contribution Pension Plans: A Takeover Defense?, *Journal of Financial Economics* 81:2, pp. 379-410.
Regier, Matthias, and Ethan Rouen, 2023, The Stock Market Valuation of Human Capital Creation, *Journal of Corporate Finance* 79:p. 102384.
Renneboog, Luc, and Cara Vansteenkiste, 2017, Leveraged Buyouts: Motives and Sources of Value, *Annals of Corporate Governance* 2:4, pp. 291-389.
Rhodes-Kropf, Matthew, and David T. Robinson, 2008, The Market for Mergers and the Boundaries of the Firm, *Journal of Finance* 63:3, pp. 1169-1211.
Richmond, Anastasia, Dragon Yongjun Tang, and Sarah Qian Wang, 2024, Do Financial Market Developments Benefit Employees? Evidence from the Derivatives Markets, *Working Paper, Bayes Business School*.
Roberts, John, and Eric van den Steen, 2000, Shareholder Interests, Human Capital Investment and Corporate Governance, *Stanford GSB Working Paper No. 1631*.
Rosett, Joshua G., 1990, Do Union Wealth Concessions Explain Takeover Premiums?: The Evidence on Contract Wages, *Journal of Financial Economics* 27:1, pp. 263-282.

Rosett, Joshua G., 2001, Equity Risk and the Labor Stock: The Case of Union Contracts, *Journal of Accounting Research* 39:2, pp. 337-364.

Rudanko, Leena, 2011, Aggregate and Idiosyncratic Risk in a Frictional Labor Market, *American Economic Review* 101:6, pp. 2823-43.

Sanati, Ali, 2025, How Does Labor Mobility Affect Corporate Leverage and Investment?, *Journal of Finacial and Quantitative Analysis*.

Schmalz, Martin C., 2015, Unionization, Cash, and Leverage, *Ross School of Business Paper No. 1215*.

Schmieder, Johannes F., 2023, Establishment Age and Wages, *Journal of Econometrics* 233:2, pp. 424-442.

Schoefer, Benjamin, 2021, The Financial Channel of Wage Rigidity, *NBER Working Paper* 29201.

Serfling, Matthew, 2016, Firing Costs and Capital Structure Decisions, *Journal of Finance* pp. n/a-n/a.

Shan, Chenyu, and Dragon Yongjun Tang, 2022, The Value of Employee Satisfaction in Disastrous Times: Evidence from COVID-19, *Review of Finance* 27:3, pp. 1027-1076.

Shen, Mo, 2021, Skilled Labor Mobility and Firm Value: Evidence from Green Card Allocations, *The Review of Financial Studies* 34:10, pp. 4663-4700.

Shi, Liyan, 2023, Optimal Regulation of Noncompete Contracts, *Econometrica* 91:2, pp. 425-463.

Shleifer, Andrei, and Lawrence H. Summers, 1988, Breach of Trust in Hostile Takeovers, in Alan J. Auerbach, ed.: *Corporate Takeovers: Causes and Consequences* (University of Chicago Press, Chicago, London), pp. 33-56.

Silva, Rui, Ramin Baghai, and Margarida Soares, 2025, The Impact of IPOs on Workers, *HKU Global Research Institute Paper* 2025/116.

Silva, Rui C., 2021, Internal Labor Markets, Wage Convergence, and Investment, *Journal of Financial and Quantitative Analysis* 56:4, pp. 1192-1227.

Simintzi, Elena, Vikrant Vig, and Paolo F. Volpin, 2014, Labor Protection and Leverage, *Review of Financial Studies* 28:pp. 561-591.

Smeets, Valerie, Kathryn Ierulli, and Michael Gibbs, 2016, An Empirical Analysis of Post-Merger Organizational Integration, *Scandinavian Journal of Economics* 118:3, pp. 463-493.

Smith, Abbie J., 1990, Corporate Ownership Structure and Performance: The Case of Management Buyouts, *Journal of Financial Economics* 27:1, pp. 143-164.

Sraer, David, and David Thesmar, 2007, Performance and Behavior of Family Firms: Evidence from the French Stock Market, *Journal of the European Economic Association* 5:4, pp. 709-751.

Starr, Evan, Natarajan Balasubramanian, and Mariko Sakakibara, 2018, Screening Spinouts? How Noncompete Enforceability Affects the Creation, Growth, and Survival of New Firms, *Management Science* 64:2, pp. 552-572.

Stein, Jeremy C., 1997, Internal Capital Markets and the Competition for Corporate Resources, *Journal of Finance* 52:1, pp. 111-133.

Strebulaev, Ilya A., and Baozhong Yang, 2013, The Mystery of Zero-Leverage Firms, *Journal of Financial Economics* 109:1, pp. 1-23.

Sun, Qi, and Mindy Z. Xiaolan, 2019, Financing Intangible Capital, *Journal of Financial Economics* 133:3, pp. 564-588.

Tate, Geoffrey, and Liu Yang, 2023, The Human Factor in Acquisitions: Cross-industry Labor Mobility and Corporate Diversification, *The Review of Financial Studies* 37:1, pp. 45-88.

Thomas, Jonathan, and Tim Worrall, 1988, Self-Enforcing Wage Contracts, *Review of Economic Studies* 55:4, pp. 541-553.

Tian, Xuan, and Wenyu Wang, 2021, Hard Marriage with Heavy Burdens: Organized Labor as Takeover Deterrents, *Review of Corporate Finance Studies* 10:2, pp. 306–346.

Titman, Sheridan, 1984, The Effect of Capital Structure on a Firm's Liquidation Decision, *Journal of Financial Economics* 13:1, pp. 137-151.

Topel, Robert H., 1984, Equilibrium Earnings, Turnover, and Unemployment: New Evidence, *Journal of Labor Economics* 2:4, pp. 500-522.

Uhlig, Harald, 2007, Explaining Asset Prices with External Habits and Wage Rigidities in a DSGE Model, *American Economic Review* 97:2, pp. 239–243.

Van Criekingen, Kristof, Carter Bloch, and Carita Eklund, 2022, Measuring Intangible Assets—a Review of the State of the Art, *Journal of Economic Surveys* 36:5, pp. 1539-1558.

Van Doornik, Bernardus, Armando Gomes, David Schoenherr, and Janis Skrastins, 2024, Financial Access and Labor Market Outcomes: Evidence from Credit Lotteries, *American Economic Review* 114:6, pp. 1854–81.

Villalonga, Belén, and Raphael Amit, 2020, Family Ownership, *Oxford Review of Economic Policy* 36:2, pp. 241-257.

Wang, Lucy, 2025, The Human Capital Reallocation of M&As: Inventor-level Evidence, *Working Paper, University of Cambridge*.

Wang, Wenyu, 2018, Bid Anticipation, Information Revelation, and Merger Gains, *Journal of Financial Economics* 128:2, pp. 320-343.

Wasserman, Noam, 2003, Founder-CEO Succession and the Paradox of Entrepreneurial Success, *Organization Science* 14:2, pp. 149-172.

Weild, David, and Edward Kim, 2009, A Wake-up Call for America, *Grant Thornton Capital Market Series*.

Wright, Mike, John Gilligan, and Kevin Amess, 2009, The Economic Impact of Private Equity: What We Know and What We Would Like to Know, *Venture Capital* 11:1, pp. 1-21.

Younge, Kenneth A., Tony W. Tong, and Lee Fleming, 2015, How Anticipated Employee Mobility Affects Acquisition Likelihood: Evidence from a Natural Experiment, *Strategic Management Journal* 36:5, pp. 686-708.

Zhang, Chunqiang, Wanqiang Ye, and Yuan Meng, 2025, Large Language Models in the Firm and Labor Income Share, *Working Paper, Anhui University of Finance and Economics*.

Zhang, Denghui, Hao Zhong, and Jingyuan Yang, 2023, Acqui-hiring or Acqui-quitting: Data-driven Post-M&A Turnover Prediction via a Dual-fit Model, *Working Paper, Rutgers Business School*.

Zingales, Luigi, 2000, In Search of New Foundations, *Journal of Finance* 55:4, pp. 1623-1653.

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