From Wage Suppression to External Imbalances: Family Control among German Corporations

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Vincent Victor

geboren in Frankfurt am Main

Erstgutachten: Prof. Dr. Till van Treeck
Zweitgutachten: Prof. Dr. Miriam Rehm

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Preface

Nowadays, an abundance of data describes our society. However, this wealth of information is only valuable if observers clearly understand what it measures and interpret it meticulously, while recognizing its limitations. Summarizing, comparing, and carefully interpreting available data may be a laborious task, but it forms the essential foundation for any further systematic analysis. The evidence presented in this dissertation is primarily descriptive in nature. It does not aim to identify generalizable relationships or causal mechanisms. Instead, it seeks to uncover underlying patterns to better understand the specific developments that shape the world as we know it today.

The thesis draws in part on my contributions to research previously published elsewhere. The construction of the ownership and governance dataset, as well as the analysis of the flow of funds in respective firms, largely consists of parts I contributed to a joint research project with Jan Behringer and Till van Treeck, titled *Family Firms and their Role in the Fall of the Labor Share and the Rise of Corporate Saving in Germany.* Similarly, this dissertation incorporates and expands upon elements of my contributions to a paper titled *Corporate Investment Trends in Germany: The Role of Financialization, Intangibles, and M&A*, co-authored with Carmen Giovanazzi and Dorothee Putscher, particularly in its analysis of corporate investment and balance sheet composition. Related to my contributions to this paper is also the discussion of accounting frameworks and the nature of goodwill although the respective sections in this dissertation focus more specifically on the national accounts and macroeconomic interpretations. Additionally, some considerations on the measurement of corporate wealth and the significance of family firms for Germany's political economy have been incorporated into a paper co-authored with Carmen Giovanazzi, published under the title *Unternehmensvermögen in Deutschland – Zur Rolle der börsennotierten Familienunternehmen.*

Like all research endeavors, this dissertation would not have been possible without the support of others. I am especially grateful to Till van Treeck for his outstanding supervision.

The ability to understand various aspects within broader contexts is largely a product of our discussions. Although the journey to completing this dissertation was at times challenging, his unwavering support and guidance – both substantively and personally – have been invaluable. I am equally indebted to Jan Behringer, who supported this project from start to finish and from whom I had the privilege to learn so much. The majority of the technical expertise required for this study stems from his exceptional knowledge and support.

Many arguments in this dissertation were developed through the exchange of ideas with others. Especially, I would like to highlight Carmen Giovanazzi. Over the years, we have worked together seamlessly on various projects connected to this dissertation and she always ensured that our discussions were not only intellectually stimulating but also genuinely enjoyable. If there is one person I could call in the middle of the night to enthusiastically explore the implications of a minor technical detail I had just realized, it would be her. This dissertation is, therefore, also a product of our shared dedication to understand complex developments and connections.

Many other discussion partners have influenced this work, particularly from the Institute for Socioeconomics and the Macroeconomic Policy Institute, but also in many other contexts. Since my childhood, Charlie Degen has provided me with unique insights into business networks in Germany, which has been instrumental in fostering my ambition to understand the institutions that shape our society. I also like to thank those, such as Felix Jerg, who offered me insights into structure and strategy in the German corporate sector from a practitioner's point of view. I am also grateful to Dorothee Putscher for the excellent collaboration on our joint research project and to Felix Walter for endless discussions on the historical and cultural foundations of the political economy in Germany.

Last but not least, I dedicate this dissertation to Lea Herzig, who first convinced me to pursue a doctorate. Despite the challenges it brought, I would have never made it without her.

Contents

1. Introduction

The distribution of income across societal groups based on their respective contributions to the production process, known as functional income distribution, has long been a central part of economic inquiry. Classical economists, such as Ricardo (1817), famously described it as the "principal problem in political economy", highlighting its foundational role in understanding economic systems. In more recent discourse, Atkinson (2009) emphasized its importance in understanding the link between macroeconomic flows and income of individual households helping to explain personal income distribution.

However, the labor share – the proportion of income distributed to workers through wages and salaries – has long been assumed to be stable in the long-run. Kaldor (1961) famously included the constancy in his "stylized facts" establishing it as a key assumption in many macroeconomic models. Accordingly, the empirical observation that, beginning in the 1980s, the labor share has decreased in many countries has attracted significant attention in both academic literature and policy circles (e.g., Bentolila and Saint-Paul, 2003; IMF, 2007). Despite ongoing debates about the extent to which various measurement issues influence the observed decline in the labor share of national income (e.g., Serres et al., 2001; Koh et al., 2020), a downward trend is also evident in the *corporate* labor share. Since 1980, the proportion of labor compensation in global corporate value added has shown a steady decline (Karabarbounis and Neiman, 2014). This seems to suggest that the workforce indeed benefits increasingly less from economic growth entailing profound societal implications.

While a decline in the corporate labor share necessarily corresponds to a rise in accounting profits, it does not necessarily imply an increase in the direct flow of income to capital owners. Rather, it appears to be linked to another phenomenon that has attracted considerable attention: the rise in corporate saving. Corporate gross saving refers to the portion of corporate profits retained by firms rather than paid to the government as taxes or distributed to capital owners as interest or dividends. Mirroring the decline in the corporate

labor share, the share of saving in global corporate value added has increased substantially since the 1980s (Chen et al., 2017). This increase has, in turn, played a significant role in the transition of the corporate sector to a net lender to the rest of the economy in a variety of countries (Dao and Maggi, 2018). Indicating a close connection between the financial balance of corporations and the current account, the rise in corporate net lending in recent decades was particularly pronounced in surplus countries (IMF, 2017*a*; Behringer and van Treeck, 2022).

With large current account surpluses in recent years, reaching up to 9 percent of GDP in 2016, Germany has emerged as a notable example of such economies. Public discourse frequently emphasizes the competitiveness of German export-oriented firms, attributing their success to the superior quality of their products. However, the "competitiveness" is predominantly linked to wage suppression. After a period of waning labor union influence, declining collective bargaining coverage, and decentralization of industrial relations (Streeck, 2010) and coinciding with drastic reforms to labor market regulations and social security systems (Butterwegge, 2018), Germany's net exports have surged specifically since the early 2000s (Behringer et al., 2020). These developments have had far-reaching consequences, not only for relative labor costs but also for household income and consumption. As argued by Klein and Pettis (2020), German firms – amid the resulting weak domestic demand – maintained high and increasing profits through sales to foreign markets.

Against this backdrop, understanding the specific micro-level shifts underlying Germany's macroeconomic developments becomes particularly important. While the literature extensively discusses the German current account surplus from a macroeconomic perspective, the sole consideration of aggregated indicators obscures the underlying patterns. To better understand these developments, three key questions arise: First, what firm-level changes contributed to the declining labor share in the 1990s and 2000s? Second, is the rise of corporate saving a direct result of changes in the labor share or rather linked to changes in profit retention and distribution behavior? Third, which financial flows constitute the surplus of the corporate sector observed in macroeconomic data?

The thesis of this dissertation is that the transformation of the corporate sector, which plays a central role in Germany's contribution to global imbalances, is primarily driven by family-controlled firms. These companies are not only more prevalent in Germany than in

other countries and have historically played a unique role in its political-economic system, they emerge as the primary force behind the shifts in the corporate sector since the 1990s, from the decline of the labor share to the sector's financial surplus.

The empirical analysis reveals that family firms systematically exhibit lower labor shares. Notably, the disparity grows as the involvement of the owning families in the companies increases. For publicly listed firms, the evidence robustly demonstrates that family-controlled firms drove declining labor shares through systematic wage suppression amid substantial growth in labor productivity. Moreover, family firms exhibit higher saving shares by retaining rather than distributing additional profits. In the absence of corresponding increases in investment, family firms consequently display significantly higher net lending positions compared to firms with other ownership structures. While direct comparison remains challenging, the systematic patterns observed in publicly listed firms strongly suggest that the distinct behavior of family firms shaped broader developments in the corporate sector.

The unique characteristics of the German economy are extensively discussed in the literature, often in comparison to other countries, for example within the framework of *varieties of capitalism* (Hall and Soskice, 2001). Among these features are a high manufacturing share combined with a high degree of specialization, incremental rather than disruptive innovation, an education system focusing on vocational training and firm-specific skills, the widespread application of wage coordination and corporate co-determination, and a reliance on bank rather than market based finance. Family ownership and control are, however, less frequently examined as defining features in broader political-economic contexts despite their significant historical importance.

Family firms have significantly shaped Germany since the Industrial Revolution. Especially during the second half of the 19th and the early 20th century, Germany was heavily influenced by entrepreneurial dynasties and their associated conglomerates. Siemens, for example, was founded in 1847 and, for a long time under family control, significantly shaped Germany's rise as an industrial nation, particularly through the spread of new communication and transportation technologies. Similarly, the steel conglomerate founded by Friedrich Krupp in 1810 played a prominent role in Germany's economic development for a long time. This is not unusual in international comparison – the roles of the Vander-

bilt family in the United States, the Wallenberg family in Sweden, or the Agnelli family in Italy come to mind. However, what is quite remarkable in Germany is the continuity of influence that individual families have exerted on the corporate landscape and thus on Germany's entire political-economic system, despite the significant upheavals in recent German history.

Merck KgaA, for example, traces its roots back to a pharmacy founded in 1668 which became a producer of pharmaceuticals in 1827. Although the American branch of the company was nationalized during World War I,[1] the company is now one of the largest pharmaceutical corporations in Germany and is still majority-owned by the same family that originally founded the pharmacy. The consumer goods company Henkel AG & Co. KGaA, especially known as a pioneer in the production of detergent, was founded in 1876. Despite the entanglement of its owners and managers with the National Socialist regime, including the exploitation of forced labor (Feldenkirchen and Hilger, 2001), the company largely survived the end of World War II unscathed. To this day, the company remains in the hands of the founding family. Generally, many large family firms, despite their sometimes considerable involvement, not only survived National Socialism and World War II but remain in the ownership of the same families (de Jong, 2022). Thus, a significant portion of the largest family fortunes in Germany is based on companies that were founded before the upheavals of the 20th century and weathered them largely intact (Tisch and Ischinsky, 2023).

The significance of family firms, however, extends far beyond their function as wealth of the owning families as their control shapes the orientation and behavior of the companies. Aside from the qualitative examination of individual families and firms, however, a comprehensive and systematic analysis of ownership structures in Germany and their influence on the respective firms is still missing, not least due to a lack of comprehensive and easily accessible data. Existing research for a variety of countries, however, shows that concentrated ownership structures, and especially family control, have a significant impact on firms' behavior and strategy (e.g., Villalonga and Amit, 2020) suggesting that the high prevalence of family firms in Germany may also have a significant influence on the overall flow of funds in the corporate sector.

[1] Later privatized and sold to the American branch of the Merck family, it now forms a separate company, Merck & Co., Inc., itself one of the largest pharmaceutical corporations in the world.

Indeed, various pieces of evidence, seemingly unrelated, point to a possible role of family firms in the decline of the labor share and rise in corporate saving. Germany's export-oriented manufacturing firms, ranging from global players in the automotive industry to specialized niche market producers, frequently described as "hidden champions" (Simon, 1996, 2009), have experienced sustained growth in recent decades following the integration of China and Eastern Europe into the global economy (Danninger and Joutz, 2007; Erber, 2014). At the same time, the potential relocation of production to these newly opened markets may have served as a powerful tool for suppressing wages. Notably, family control is especially prevalent among firms in traditional industries, particularly in manufacturing (Achleitner et al., 2019). Moreover, some evidence suggests that family firms tend to adjust employment – and consequently salary expenses – less in response to fluctuations in sales compared to firms with other ownership structures (Nollenberger, 2024), creating a trade-off between wage levels and employment security. This could have contributed to employees benefiting relatively less from the economic upswing in respective industries.

Additionally, family-controlled firms may be less inclined to distribute profits. Instead, they may prefer to retain earnings, as wealthy families are not dependent on payouts for consumption and may regard the accumulation of wealth as an end in itself (Carroll, 1998). This tendency may be reinforced by Germany's inheritance tax laws, which strongly favor business assets, providing an incentive for controlling family shareholders to retain excess profits within their companies, regardless of investment opportunities (Bach, 2015). This background provides compelling reason to systematically examine the influence of family firms on the macroeconomic developments in Germany.

To support this proposition, data on the German corporate sector are analyzed at different levels, revealing both clear patterns and notable differences in the development of micro and macro indicators. The analysis of national accounts provides the macroeconomic context, while detailed firm-level data from *Worldscope* offers granular insights into publicly listed firms between 1993 and 2022. To identify family controlled firms, an original dataset containing comprehensive ownership and governance information on German publicly listed firms is compiled, in which various data sources are combined and supplemented through extensive manual research.

Before turning to the contribution of family firms, overall trends are documented using macro and micro data. In both data sources, the decline in the labor share is evident. Yet, while the labor share recorded in the national accounts eventually exhibits a recovery, the aggregate labor share in firm-level data continues to decrease throughout the entire period. Notably, the recovery observed in macro-level data is primarily accompanied by a sharp decline in distributed profits, which cannot be observed in firm-level data. Corporate saving, on the other hand, shows a consistent increase in both data sources. Although the data series are not directly comparable, these differing trends might suggest that the initial decline in the labor share and the continuous rise in gross saving are driven by publicly listed firms in the sample while the subsequent increase in the labor share is likely a phenomenon driven by privately held, often smaller firms which remain outside the scope of micro-level analysis due to limited data availability. Consistent with this interpretation, a significant increase in the net lending of listed firms is observable, closely aligning with the rise in the corporate sector's net lending position as reported in national accounts.

Analyzing disaggregated trends, a key finding is that the decline in the labor share in Germany can almost entirely attributed to reductions in the individual labor shares of incumbent firms. Unlike the pattern observed for the US, where the aggregate decline in the labor share has been linked to a small number of rapidly expanding firms or firms with initially low labor shares (Autor et al., 2020; Kehrig and Vincent, 2021), the decrease in Germany is more evenly distributed across publicly listed firms and is not associated with shifts in market shares.

At the firm level, the rise in corporate profits as a share of value added – implied by the decline in the labor share – is almost entirely reflected in corresponding increases in gross saving while taxes, interest payments, and payouts to shareholders have remained relatively stable in terms of value added. Furthermore, higher saving has not been systematically channeled into increased investment spending but instead into higher net lending. In other words, firms with the most pronounced declines in their labor shares exhibit the largest increases in saving and subsequently in net lending. These findings indicate that the rise in the financial surplus is a direct result of the declining labor share in a substantial segment of publicly listed firms and not driven by changes in the propensity to retain or distribute profits.

As implied by accounting identities, an increase in net lending should correspond to the accumulation of financial assets. While no clear patterns in the use of net lending can be identified at the level of individual entities, the aggregate increase in net lending among publicly listed firms is primarily associated with a rise in goodwill on the balance sheet. This suggests that the financial surplus is at least partially linked to mergers and acquisitions (M&A). However, as goodwill does not constitute a financial asset, this observation raises questions about the true nature of financial surpluses and the proper categorization of excess costs of acquisitions.

These findings present a marked contrast to observed patterns in other countries, particularly the US. The US corporate sector exhibits recurring dynamic change associated with disruptive innovation, in recent decades exemplified by the rise of technology giants such as Apple, Amazon or Google, and even more recently Tesla or Nvidia. The German corporate landscape, in contrast, is characterized by continuity, not least due to the strategic orientation of family firms.

The analysis of the differences between family and non-family firms is conducted using a dataset specifically developed for this purpose. Primarily building on data from *Hoppenstedt Aktienführer*, a reference work on German listed firms, it combines information from a large variety of sources. The data from *Hoppenstedt Aktienführer*, although providing the names of firms' shareholders and managers, requires substantial supplementation to systematically and comprehensively capture ownership and governance structures. Through extensive manual research across diverse publicly available sources, the dataset is enhanced with detailed information on individual shareholders capturing multiple dimensions including familial relationships, founder connections, and the extent of involvement of owners across management and supervisory boards. This approach allows not only for the identification of family-controlled firms but to delineate different subgroups of family firms based on differences in corporate governance. The dataset thus maps the evolution of ownership and governance structures across German corporations over a three-decade period. The longitudinal nature and granular detail of this information extends significantly beyond existing research, which typically focuses on cross-sectional analyses at specific points in time (e.g., Aminadav and Papaioannou, 2020).

By examining the long-term patterns of ownership and control in German public firms, this research contributes to a systematic documentation of ownership and governance structures but also enables the identification country-specific factors behind changes in the distribution of corporate value added in Germany. In this regard, the present analysis highlights the following aspects. The aggregate labor share of family firms decreased more than the aggregate labor share of non-family firms and the labor share fell particularly sharply in sectors where family firms are most strongly represented, especially in manufacturing. Similar differences can be observed for aggregate gross saving and net lending in terms of value added, which have increased more significantly for family firms. These findings are further supported by regression analyses, which demonstrate that, on average, family firms have lower labor shares and exhibit higher saving and net lending than non-family firms, after controlling for a variety of other firm characteristics.

In addition to the effect of family ownership, the varying degrees of family involvement in corporate governance reveal interesting patterns. Firms exhibit progressively lower labor and higher saving shares as family presence increases across governance structures - whether through representation on the management board, supervisory board, or both - compared to firms lacking such family involvement. While externally managed family firms still have lower labor shares and higher saving than non-family firms, the analysis further reveals that founder-led firms and those managed by other family members display more pronounced effects on both metrics. Without attempting to identify the causal mechanisms behind these differences, the results suggest that the effect becomes stronger the more deeply the families are involved in the companies.

The data also reveal that differences in the labor share, and consequently in the overall flows of funds, do not stem from family firms exhibiting exceptionally high labor productivity. Instead, the lower labor share is directly attributable to significantly lower wages. However, changing productivity is the main driver of stronger labor share *decline* in family firms. In recent years, the productivity of family firms has converged while labor compensation has remained below the levels of their non-family counterparts.

While the data clearly demonstrate family firms' capacity to maintain lower wage levels, the analyses do not offer a conclusive explanation for how family firms manage to suppress wages more effectively than other firms. In particular, they provide no evidence to vali-

date theoretical propositions regarding employment security trade-offs, as suggested in the literature on implicit labor contracts (e.g., Mueller and Philippon, 2011). If employees in German family firms do hold expectations of higher job security, they may be unfounded. However, further research seems needed to uncover the causal mechanism behind this phenomenon.

Overall, this study provides a comprehensive view of the corporate sector, highlighting that the decline in the labor share was primarily driven by long-standing incumbent firms that have dominated the German economy for a long time by distributing an increasingly smaller share of their individual value added to employees. Among them, family-controlled firms stand out as the principal drivers of this trend. The subsequent rise in corporate saving in Germany does not stem from a change in behavior regarding the propensity to retain profits but is instead largely attributable to the declining labor share. Consequently, family control emerges as a decisive factor shaping recent developments in the corporate sector, influencing both income and wealth distribution as well as Germany's current account.

As these results suggest that the dynamics shaping the developments are determined by Germany's unique institutional characteristics, they challenge the conclusions by Karabarbounis and Neiman (2014) and Chen et al. (2017), that the observed trends in the corporate flow of funds are pervasive across countries and different types of economic activities and therefore likely to be caused by a common factor. Considering the distinct patterns in other countries, such as those observed in the US (Autor et al., 2020; Kehrig and Vincent, 2021), they demonstrate that superficially similar developments in different countries are driven by different underlying factors.

Beyond its empirical findings, this dissertation makes several methodological contributions by revealing important measurement challenges in the analysis of corporate financial flows. While firm-level data shows clear connections between declining labor shares and rising net lending positions, the nature of these financial surpluses remains difficult to interpret due to significant data limitations and conceptual complexities. This challenge is particularly pronounced when attempting to comprehensively analyze the corporate sector, as the restricted availability of firm-level data beyond publicly listed companies presents a substantial barrier to investigating micro-level patterns that underlie macroeconomic

trends. The problem is especially significant in Germany, where privately held firms play a central economic role.

Furthermore, examination of available data at both macro and micro levels demonstrates the critical importance of evaluating individual indicators within the broader context of the flow of funds to prevent potential misinterpretation. The growing significance of M&A activities introduces additional analytical complexity, specifically regarding the macroeconomic classification of goodwill and related flows. Adding to these difficulties, apparent inconsistencies in Germany's national accounts present substantial challenges for accurately tracking corporate financial flows. Finally, the relationship between retained earnings and equity valuation remains theoretically ambiguous, raising fundamental questions about corporate net worth in national accounts. These methodological challenges are discussed against the backdrop of the empirical findings presented in this study, as they significantly influence our ability to draw definitive conclusions about corporate sector dynamics.

The structure of this dissertation is as follows. Chapter 2 reviews the relevant literature. In Chapter 3, the flow of funds within the German corporate sector is analyzed from a national accounts perspective, addressing the conceptual framework and presenting empirical trends. Chapter 4 shifts the focus to the firm level, examining the underlying dynamics through firm-level financial information. Chapter 5 introduces the ownership and governance dataset in detail and investigates the role of family firms in shaping the observed trends. Chapter 6 discusses several conceptual and data issues related to the presented analyses. Chapter 7 provides concluding remarks focusing on the broader implications of the findings. Additional figures and tables can be found in Appendix A while Appendix B, provided separately in digital form, offers further details on the construction of the ownership and governance dataset including a complete documentation of sources.

2. Related Literature

The analyses presented in this study primarily build on research in five strands of literature. The first concerns determinants of global imbalances. The second and third pertain to functional income distribution and the corporate flow of funds. There is extensive literature on the decline of the labor share and the rise in corporate saving. However, both are examined, primarily, separately and not in the context of the entirety of corporate financial flows. Fourth, since a persistent financial surplus implies accumulation of financial assets, it is also connected to the literature on the financialization of non-financial corporations. Finally, the analyses presented here are based on an extensive body of literature that examines ownership structures, family firms, and their specific characteristics, but so far, not in connection with the corporate flow of funds and its macroeconomic implications.

Current account imbalances, particularly the global imbalances that emerged over recent decades, have been extensively analyzed in both academic literature and policy discussions (e.g., Bernanke, 2005; Gruber and Kamin, 2007; Barnes et al., 2010; Lane and Milesi-Ferretti, 2012; IMF, 2023). Regarding the theoretical understanding of these imbalances, two distinct perspectives can be distinguished: the intertemporal approach and a structuralist perspective (Behringer et al., 2020).

The intertemporal approach views current account imbalances as outcomes of rational saving and investment decisions based on households' intertemporal optimization (e.g., Sachs, 1983; Obstfeld and Rogoff, 1995). At its core, this framework emphasizes consumption-smoothing behavior over time. Under the assumption of rational expectations, the model predicts current account deficits and surpluses depending on households' anticipations regarding future domestic output growth (Ghosh and Ostry, 1995). Two factors prove particularly significant within this framework: demographic developments and country-specific returns to capital. Demographic structures influence saving patterns through life-cycle consumption smoothing, while differences in marginal returns to capital may drive investment flows between countries. Through this lens, Germany's persistent current ac-

count surplus in recent decades primarily reflects its status as an advanced economy with an aging population.

A contrasting perspective characterizes global imbalances as manifestations of distributional conflicts within countries. This approach builds upon Hobson (1902, 1909) who argued that income redistribution from labor to capital tends to suppress aggregate demand while generating excess savings. Pettis (2013) and Klein and Pettis (2020) apply this framework to explain how surpluses in countries like China and Germany emerged from shifts in income distribution that dampened domestic demand and increased saving. This view suggests that deficit countries, particularly the US, absorbed these excess savings by maintaining consumption levels through higher debt amid growing personal income inequality. Similarly, Rajan (2010) argues that rising inequality and increasing household debt in the US contributed to global imbalances. Supporting this proposition, Behringer and van Treeck (2018) show that declining labor shares in national income are associated with rising current account surpluses, while increasing personal income inequality is associated with current account deterioration.

Closely related to the latter view on global imbalances, the decline in the labor share over recent decades has attracted considerable interest. Studies have proposed a wide array of potential explanations across different levels of analysis and various countries, leading Grossman and Oberfield (2022) to remark that "collectively, they have 'explained' the phenomenon many times over." Yet, a clear consensus on the causes of these developments has not emerged. Moreover, much of the evidence is based on cross-country studies or micro data on US firms. While the decline is evident across numerous countries with diverse institutional settings, there are relatively few country-specific studies beyond the US, and limited attention is given to unique institutional characteristics.

Some studies have linked the decline in labor shares to international trade, particularly the relocation of manufacturing from advanced economies to China. Such studies include, for example, Elsby et al. (2013), who analyze industry-level data for the US. Similarly, Böckerman and Maliranta (2012) report that the labor share among Finnish firms is negatively related to industries' exposure to international competition.

Other contributions focus on technological change as explanation. Karabarbounis and

Neiman (2014) argue that a decrease in the relative cost of investment goods, associated with the rise of the digital economy, led firms to transition toward more capital-intensive production, which in turn caused the decline in aggregate labor shares. Closely related, Acemoglu and Restrepo (2018) highlight the influence of technological change which impacts labor and capital inputs in different ways. This perspective is supported by empirical analyses that connect changes in the labor share to technological advancements, especially automation, such as Dao et al. (2017) who analyze industry-level data in advanced and emerging economies between 1991 and 2014.

Others, such as Barkai (2020), contend that the decline in the labor share is not offset by a rise in the share attributable to capital inputs but is instead driven by a rise in pure profits. Consistent with this perspective, Gutiérrez and Philippon (2018) argue that changes in market structure – particularly due to the weakening of antitrust enforcement – have significantly reduced competition, especially in the US. De Loecker et al. (2020) and Covarrubias et al. (2020) document a subsequent rise in profit markups, which in turn accounts for the decline in the US labor share.

Yet another line of argument associates the decline in labor shares to the weakening bargaining power of workers. Since the 1980s, the share of workers organized in unions and negotiating their wages collectively has declined significantly across industrialized countries (OECD and AIAS, 2021). The subsequent reduction of employees' bargaining power vis-à-vis employers, may have led to a redistribution of rents from labor to capital owners reflected in the observed decline in labor shares (e.g., Blanchard, 1997; Stansbury and Summers, 2020). Supporting this proposition, Kristal (2010) demonstrates that trends in labor shares in industrialized countries are closely associated with changes in unionization and strike activity. Similarly, Bengtsson (2014) identifies a positive correlation between union density and national labor shares in advanced economies and Farber et al. (2021) and Young and Zuleta (2018) report a positive effect of union density on US labor shares. Regarding the specific case of Germany, a large body of literature on political-economic institutions emphasizes the effects of changes in union influence, collective bargaining coverage and industrial relations in general for the development of real wages in Germany in the 1990s and 2000s (e.g., Baccaro and Benassi, 2016; Baccaro and Höpner, 2022).

Beyond these interpretations, some studies highlight underlying firm-level dynamics driven

by small groups of firms. Autor et al. (2020) emphasize the role of shifting market shares between individual firms in the evolution of aggregate labor shares, which generally speaks against factors which are likely to affect all firms to a similar degree. Instead, they argue for the rise of "superstars" as explanation, where firms with initially low labor shares, due to product markets being increasingly defined by a "winner takes most" mechanism, strongly grow in size. Analyzing establishment-level data for the US manufacturing sector, Kehrig and Vincent (2021) evaluate the "superstar hypothesis" alongside two other, competing scenarios which might describe the underlying dynamic: a "big player scenario", in which already large firms show a reduction in their individual labor shares over time, and a "rising star scenario", where the labor share of initially smaller firms declines as they expand their market shares. They conclude that the "rising stars" are best suited as explanation. The firm-level evidence in both studies is however restricted to the US and it seems unclear to what extent the results can be generalized to other countries.

Although the decline of the labor share is documented for countries around the world, there has been an ongoing debate about whether the observed decline represents a genuine shift or merely an artifact resulting from measurement issues. For example, Koh et al. (2020) argue that the decline in the US labor share in national income is a result of the changing treatment of intangible capital in national accounts. Another frequently raised issue concerns the treatment of income from self-employment, specifically how its inclusion alongside wages affects the trajectory of labor shares (Elsby et al., 2013; Smith et al., 2022). Moreover, some contributions argue that the apparent decline in some countries is primarily driven by developments in the housing market (Rognlie, 2015; Gutiérrez and Piton, 2020).

Similar to the fall in the labor share, the rise in corporate saving has attracted considerable attention in the literature. The trend has been documented since the early 2000s based on national accounts data and its implications, especially for macroeconomic imbalances, have been widely discussed (e.g., IMF, 2006; André et al., 2007; IMF, 2017*a*; Dao and Maggi, 2018; Behringer and van Treeck, 2022).

Chen et al. (2017) are one of the few who do not examine the rise in corporate saving as an isolated phenomenon but rather in the context of the overall flow of funds within the corporate sector. Using a large international firm-level dataset to complement national

accounts data, they demonstrate that the rise in corporate saving closely tracks the decline in the labor share, amid stable taxes and interest payments as a proportion of value added. Moreover, they observe that the increase in saving is not concentrated within specific types of countries, industries, or firms. These findings are reinforced by a general equilibrium model, suggesting that changes in the cost of capital, including reductions in real interest rates, the price of investment goods, corporate income taxes, and rising markups, may account for the global increase in corporate saving in conjunction with a decrease in the labor share and stable payouts to shareholders.

While it seems reasonable to assume that higher profit retention, as opposed to payouts, is driven by increased investment needs, such a relationship seems unlikely in the wake of sluggish growth in investment spending despite substantial corporate saving (Gruber and Kamin, 2016; Gutiérrez and Philippon, 2017). Nevertheless, Falato et al. (2022) point to the shift in investment toward intangible assets, which cannot be used as collateral, arguing that these changes have encouraged firms to rely more heavily on internal financing sources. Likewise, Fan and Kalemli-Özcan (2015), in their analysis of Asian economies, link corporate saving to firm-level credit constraints.

Other studies highlight a precautionary motive, suggesting that firms accumulate savings as a buffer against risks during periods of heightened uncertainty (Bates et al., 2009; Riddick and Whited, 2009; Armenter and Hnatkovska, 2017). Similarly, Anderson and Hamadi (2016) analyze data on Belgian listed firms between 1991 and 2006 and find a strong positive correlation between ownership concentration and cash holdings, which may suggest a precautionary motive of controlling shareholders who place high value on maintaining control. In contrast, Saibene (2019), examining US firms, explores multiple potential reasons for the increase in saving but finds no empirical support for any of them, including a precautionary motive associated with uncertainty.

Finally, there is some evidence for tax motives as drivers of the evolution of saving. Using a large international firm-level dataset, Kawamoto and Muraki (2020) show that firms increase saving following reductions in corporate tax rates. They therefore conclude that the rise in corporate saving is linked to increasing tax competition. Foley et al. (2007) argue for repatriation taxes as drivers of increasing cash holdings among US firms as multinational corporations hold cash in their foreign subsidiaries to avoid tax costs of repatriating

international profits.

A persistent financial surplus of firms implies that they increasingly accumulate financial assets. A key proposition of the literature on corporate financialization is that non-financial firms increasingly acquire financial assets rather than tangible or intangible assets directly tied to the production of goods or the provision of non-financial services. In examining net lending and the resulting balance sheet composition in such firms, the analyses are also connected to this strand of literature.

Since the 1980s, profound shifts in economic policy and corporate governance regimes have fostered an environment characterized by the rise of shareholder value orientation, the relative expansion of the financial sector, and its increasing dominance over other parts of the economy. This development, along with its potential causes and implications, has been extensively discussed in the literature (e.g., Lazonick and O'Sullivan, 2000; Froud et al., 2000; Epstein, 2005; Stockhammer, 2004, 2013).

One notable aspect of this development is the asset-based financialization of non-financial firms. Driven by a strategic shift toward short-term valuation, these firms increasingly emulate the behavior of financial corporations resulting particularly in a growing share of financial assets on their balance sheets. A trend toward accumulation of such assets has been particularly documented among US firms (Davis, 2016, 2017). However, Rabinovich (2019) argues that the rise in financial assets relative to non-financial assets does not necessarily indicate a reorientation toward financial markets but may instead reflect other increasingly common practices, such as the internationalization of business operations, tax avoidance strategies, and M&A activity. Moreover, most empirical evidence on asset-based financialization in non-financial firms only encompasses Anglo-Saxon countries. Recent studies focusing on German non-financial corporations reveal only partial adoption of practices associated with financialization in general (Giovanazzi, 2024) and find no evidence for asset-based financialization in particular (Giovanazzi et al., 2024).

The composition of corporate sectors in different countries shows significant differences, which are influenced by a variety of factors such as geographical location or the availability of natural resources. Furthermore, they operate under different institutional conditions that significantly shape their composition and operations. Among these institutional char-

acteristics, the role of family control is at the center of this analysis. This also connects it to the extensive literature that deals with the documentation of ownership and management structures, as well as their impact on various firm characteristics and behaviors.

For many years, it was widely assumed that large, publicly listed companies typically had dispersed ownership structures, as argued in the influential work by Berle and Means (1932). This view suggests that control in such firms was spread across a wide base of shareholder, leading to minimal influence from any single one. However, starting with La Porta et al. (1999), empirical research has challenged this assumption, revealing that a substantial proportion even of large public firms around the world are, in fact, controlled by individual shareholders, including families. While this finding, in general, has been substantiated by a wide range of studies (e.g., Faccio and Lang, 2002; Lins et al., 2013; Aminadav and Papaioannou, 2020), they also reveal significant differences in the prevalence and importance of family control across countries. For example, Aminadav and Papaioannou (2020) identify 29.2 percent of listed firms in France as controlled by individual families, 22.8 percent in Brazil, 17.4 percent in South Korea, 16.2 percent in the US, and only 10.1 percent in the UK. In Germany, the prevalence of family firms is notably high, with approximately 40 percent of publicly listed, non-financial firms found to be under family control (Franks et al., 2015; Achleitner et al., 2019). While prior research has largely focused on documenting ownership and control structures within the German corporate sector at specific points in time, the present study extends the analysis to cover a nearly 30-year period. By doing so, it provides a more comprehensive view of the evolution of ownership structures over time and enables a deeper understanding of the role family control plays in the broader corporate landscape.

Through the investigation of differences in the flow of funds, this study also contributes to the extensive literature on behavior and performance in family-owned firms. Although results in this area are mixed, a general consensus has emerged that family firms do not underperform relative to non-family firms in terms of profitability (Demsetz and Villalonga, 2001; Anderson and Reeb, 2003; Sraer and Thesmar, 2007) and firm value (Claessens et al., 2002; Villalonga and Amit, 2006).

Numerous studies emphasize the significant role of ownership and control structures, particularly family ownership, in shaping strategic decisions. The differences in this regard are

often attributed to a higher degree of risk aversion of controlling shareholders, especially families (e.g., Shleifer and Vishny, 1986), and their strong preference for retaining control and ensuring its transfer to future generations (e.g., Casson, 1999; Arregle et al., 2007). Consistent with these arguments, existing evidence highlights notable differences in investment policies. Anderson et al. (2012) show that family firms, compared to non-family firms, allocate fewer resources to investment overall, with particularly lower investment in R&D which may be characterized by greater risk and potential disruption. Similarly, Chrisman and Patel (2012) find that family involvement in US firms negatively impacts R&D spending relative to sales. Furthermore, family ownership has been found to have a negative effect on both the number and volume of acquisitions (Miller et al., 2010) and the degree of diversification of business operations (Gomez-Mejia et al., 2010).

The literature on implicit labor contracts suggests that family firms are able to pay lower wages by making more credible commitments to job security compared to firms with other ownership and control structures (Bach and Serrano-Velarde, 2009; Mueller and Philippon, 2011). Supporting this argument, Bassanini et al. (2013) show for a panel of French firms that family firms indeed pay lower wages. Moreover, there is evidence for higher employment retention in French (Sraer and Thesmar, 2007), Swedish (Bjuggren, 2015), and US family firms (Lee, 2006) facing economic shocks, compared to non family firms. In close relation, Block (2010) shows that family firms in the US are less likely to make large structural adjustments through employment downsizing.

Closely tied to the corporate flow of funds is the effect of family ownership on distribution policy, particularly as it determines the income families derive from their companies. While Setia-Atmaja et al. (2009) and Isakov and Weisskopf (2015) find positive effects of family involvement on dividend distribution, the evidence remains inconclusive, with Villalonga and Amit (2006) reporting lower dividend rates in family firms. Interestingly, Gomez-Mejia et al. (2003) observe that executive compensation in family firms tends to be lower for managers who are part of the controlling family than for external managers.

Finally, this work is related to the literature examining the effects of family succession, which explores how corporate behavior and performance vary depending on whether family firms are managed by their founders, their heirs, or external managers. Studies have shown that the effect of family control on firm performance may vary with the generation

of family members involved in the firm's management. Evidence on Danish firms (Bennedsen et al., 2007) and US firms (Villalonga and Amit, 2006) indicates that founder-managed firms perform better than their widely held counterparts while heir-managed ones perform worse. Similarly, Bloom and Van Reenen (2007) show that family succession is associated with decreasing management quality. However, Sraer and Thesmar (2007), in their study of French firms, observe that not only founder-led and professionally managed family firms outperform their widely held counterparts, but heir-managed family firms also show superior performance.

3. The Macroeconomic Perspective

To shed light on the structure and development of the corporate sector, this chapter first turns to a macroeconomic perspective. Specifically, the flow of funds and the associated stocks as recorded in the national accounts for the non-financial corporate sector in Germany are examined. Before analyzing empirical trends, it is essential to be reminded of the conceptual framework and what can theoretically be inferred from this representation. Accordingly, the next section provides a brief overview of the framework for the corporate sector within the System of National Accounts, specifically following ESA 2010 (Eurostat, 2013), and its implementation in Germany.

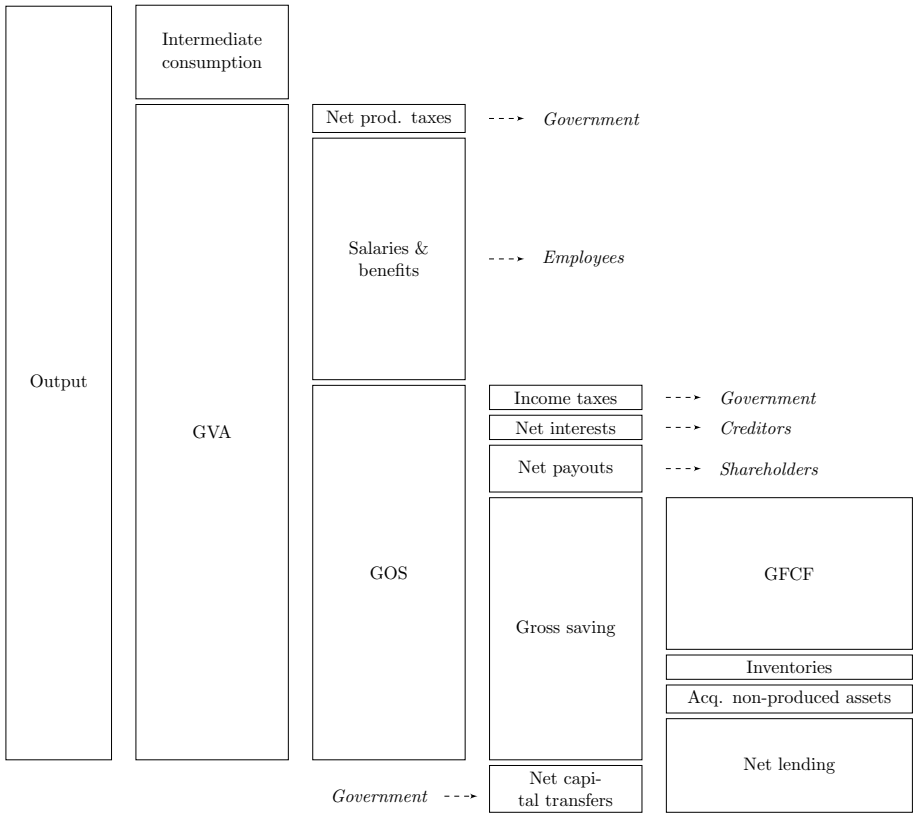
3.1 The National Accounts Framework

While the national accounts are primarily designed for examining the entire economy, they simultaneously differentiate between four distinct institutional sectors, allowing for a more detailed analysis. Along with contributions from foreign actors, these four sectors collectively encompass all economic activities within the respective country. The four distinguished sectors are households, the government, financial corporations, and non-financial corporations. The following analyses focus on the non-financial corporate sector which encompasses "units which are independent legal entities and market producers, and whose principal activity is the production of goods and non-financial services" (Eurostat, 2013). For each sector, there are two separate sequences of accounts that depict non-financial and financial transactions, as well as an integrated balance sheet which depicts the resulting non-financial and financial stocks. As intra-sector transactions are generally consolidated, the sector accounts depict the net transactions between sectors.

The sequence of accounts depicting non-financial transactions, schematically represented in Figure 3.1, starts with the total domestically produced output of the corporate sector which equals the domestic sales or revenues of the firms which constitute the sector.

Deducting intermediate consumption yields gross value added (GVA), which, in turn, is distributed toward various recipients. First, taxes on production net of subsidies are deducted. While these taxes generally constitute a rather small share of total GVA, a far larger proportion is distributed to the employees of the respective firms as salaries and benefits expenses. Salaries and benefits as a share of GVA are typically referred to as corporate labor share, central to the income distribution in the overall economy as it constitutes a substantial part of the income of the household sector.

Figure 3.1: Non-financial transactions, national accounts, corporate sector



Source: Author's illustration based on ESA 2010.

The remaining part of GVA, gross operating surplus (GOS), generally interpreted as the aggregate profits of the included firms, is, in turn, allocated to various targets. Again, taxes, specifically income taxes, are collected by the state. Interest payments flow to creditors and payouts are distributed to shareholders. Both are, however, offset by inflows

resulting from capital income including payouts and interest payments received.[1] Deducting these expenses yields gross saving which represents profits retained inside the firms over a given year. Together with net capital transfers received, gross saving constitutes the internal funds available for investment financing. Net capital transfers consist of transfers paid as well as received by the corporate sector, primarily to or from the government sector. Theoretically, transfers paid comprise mainly capital taxes. However, this item is zero in Germany for the entire period under consideration, as there are no taxes that may be included int his category (Eurostat, 2024). As a result, capital transfers paid by the corporate sector are of little relevance. On the other hand, transfers received are primarily comprised of funds originating from the government sector including, but not restricted to, investment grants.

Internally available funds match the sum of changes in non-financial assets, associated with investment, and net lending/borrowing which reflects the financial balance of the corporate sector. Changes in non-financial assets include two main components: gross capital formation (GCF) and acquisitions less disposals of non-produced assets. GCF, in turn, can be divided into different components.

Gross fixed capital formation (GFCF) generally constitutes the largest portion of GCF and includes expenditures on tangible assets, such as buildings and equipment, and additions to intellectual property encompassing expenditures on certain intangibles like software, as well as spending on both internal and external R&D. GFCF increases what is considered the capital stock in the macroeconomic sense and is accordingly the most commonly used proxy for investment spending. Furthermore, GCF includes changes in inventories and acquisitions less disposals of valuables. While the latter are generally of little relevance for corporate sectors, inventories may affect GCF positively, if funds are used for inventory buildup, or negatively if funds are released through use or sale of inventories.

Non-produced assets include land, natural resources, contracts, leases and licenses, as well as goodwill resulting from corporate transactions. A closer examination is required for the last category. When a target firm is acquired by another company within the same corporate sector, the target's assets and liabilities are incorporated into the acquirer's bal-

[1] As intra-sector transactions are consolidated, the recorded inflows originate from other sectors, in the case of capital income, primarily from foreign corporate sectors.

ance sheet. This consolidation increases the acquirer's assets, while the target contributes a corresponding negative change to total assets in the sector. On aggregate, the balance sheet remains unchanged unless the transaction involves an actor from a different sector or country. However, if the purchase price exceeds the target's net asset value, the surplus is recorded as goodwill, effectively adding previously unrecorded assets to the balance sheet even if both firms are part of the same sector. In national accounts, the corresponding flow is classified as the acquisition of non-produced assets. Unfortunately, goodwill, both as a stock and related flows, are not included in Germany's sectoral accounts.[2]

Net lending/borrowing is a residual measure derived by deducing the change in non-financial assets from gross saving and net capital transfers. If the internal funds available in a given period exceed the transactions associated with net additions to non-financial assets, the sector has a financial surplus and acts as a net lender to the rest of the economy. Conversely, if net additions to non-financial assets exceed the internally available funds, the deficit is offset by net borrowing from other sectors.

The financial balance is often interpreted as the difference between saving and investment. However, technically, the financial balance amounts to the difference between internal funds resulting from saving and net capital transfers and additions to non-financial assets. This might seem like a minor technicality, but it may have significant implications. First, if the financial balance is primarily determined by the internal resources of the sector, this does not necessarily have to be the result of retained profits but can also be influenced by government funds flowing into this sector. Second, the financial balance, on the expenditure side, does not necessarily have to be determined by what is typically understood as investment in a macroeconomic sense but can also be influenced by the acquisition of non-financial, non-produced assets.

Generally, we would expect the corporate sector to be a net borrower, as firms, also on the aggregate, borrow funds from other sectors to finance investment. Technically, this would be associated with a net increase in liabilities, which represent financial assets owned by the rest of the economy. Conversely, a positive net lending position, would be associated with net accumulation of financial assets which, by definition, entail counterpart liability

[2] Although they are specified in ESA 2010, the Federal Statistical Office explicitly notes that non-produced assets other than land are not available (Destatis, 2023, p. 4).

of other actors. In such a case, the financial transactions in the sector accounts reveal which financial assets are accumulated.

In the financial transactions accounts, flows corresponding to the acquisition of financial assets or the incurrence of liabilities, consolidated at the sector level, are depicted. Integrating both determines the net financial transactions, meaning a financial surplus or deficit, which should theoretically match the net lending/borrowing position of the sector. For example, if a positive net lending position is the result of corporations keeping excess saving after investment exclusively as cash, the disaggregation of net financial transactions would show a positive change in cash holdings which quantitatively matches net lending. Similarly, if excess saving flows into the acquisition of shares, financial transactions would reveal a matching change in shares held by the sector and so forth. Conversely, in the case of a net borrowing position, the financial transactions should reveal the different types of liabilities whose incurrence matches the deficit of the sector. Differences between net lending/borrowing and net financial transactions should be refined to minor statistical discrepancies, enabling a comprehensive understanding of the nature of observed trends.

Ultimately, the transactions result in changes to the sector's integrated balance sheet, illustrated in Figure 3.2. The left-hand side shows the sector's assets, while the right-hand side shows its liabilities, representing financial claims from other sectors, and net worth. The assets are divided into non-financial and financial categories. Non-financial assets include produced items, both tangible and intangible, which form the capital stock, as well as non-produced assets like land.[3]

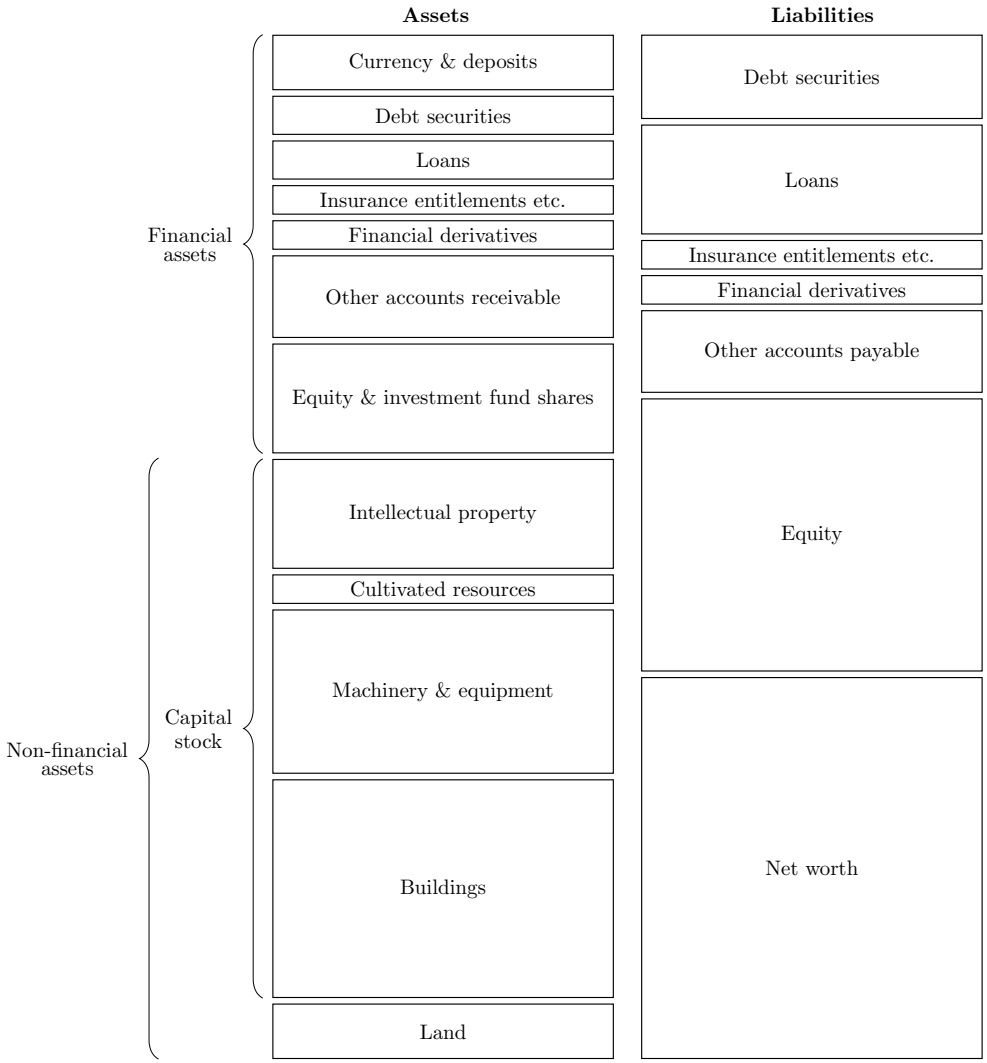
Financial assets encompass various forms, each corresponding to a liability for another sector. Liabilities represent payment obligations, which are financial assets of other sectors.[4] Both sides of the balance sheet are directly influenced by the flows described above. However, only gross measures were previously considered. Actual changes in non-financial assets depend also on adjustments for the consumption of fixed capital. Furthermore, financial assets (and liabilities) are subject to value changes which do not constitute transactions.

[3]Non-produced assets theoretically include other categories which are, however, not recorded in the time series for Germany, as described above.

[4]Note that currency and deposits can be assets of the corporate sector but not liabilities, since cash liabilities are exclusive to banks which are included in the financial corporate sector.

Net worth, recorded on the right side of the balance sheet as the difference between total assets and liabilities, warrants additional examination. Generally, it represents the portion of assets not matched by a corresponding claim from another sector but resulting from previous saving. In the case of the corporate sector, however, this concept becomes unclear.

Figure 3.2: Balance sheet, national accounts, corporate sector



Source: Author's illustration based on ESA 2010.

The equity item on the liability side represents the residual claims of the corporations' owners against the sector, measured as the market price of the shares held. However,

everything not directly representing a claim by another party should be attributed to the firms' owners. Thus, the owners should be attributed the net worth as well, since the corporate sector cannot own itself. If the market value of equity is smaller than the difference between total assets and debt obligations, market prices do not accurately capture the net assets within the corporate sector. The European System of Accounts conceptually acknowledges this issues and advises to "consider the net worth accumulated over the life of the corporation" when estimating market prices of equity of the corporate sector (Eurostat, 2013, p. 178). If, however, this is not done sufficiently, it carries significant implications as assets existing in the economy but not assigned to an ultimate owner are not reflected in measures of personal wealth distribution based on national accounts data.

3.2 Empirical Trends in the German Corporate Sector

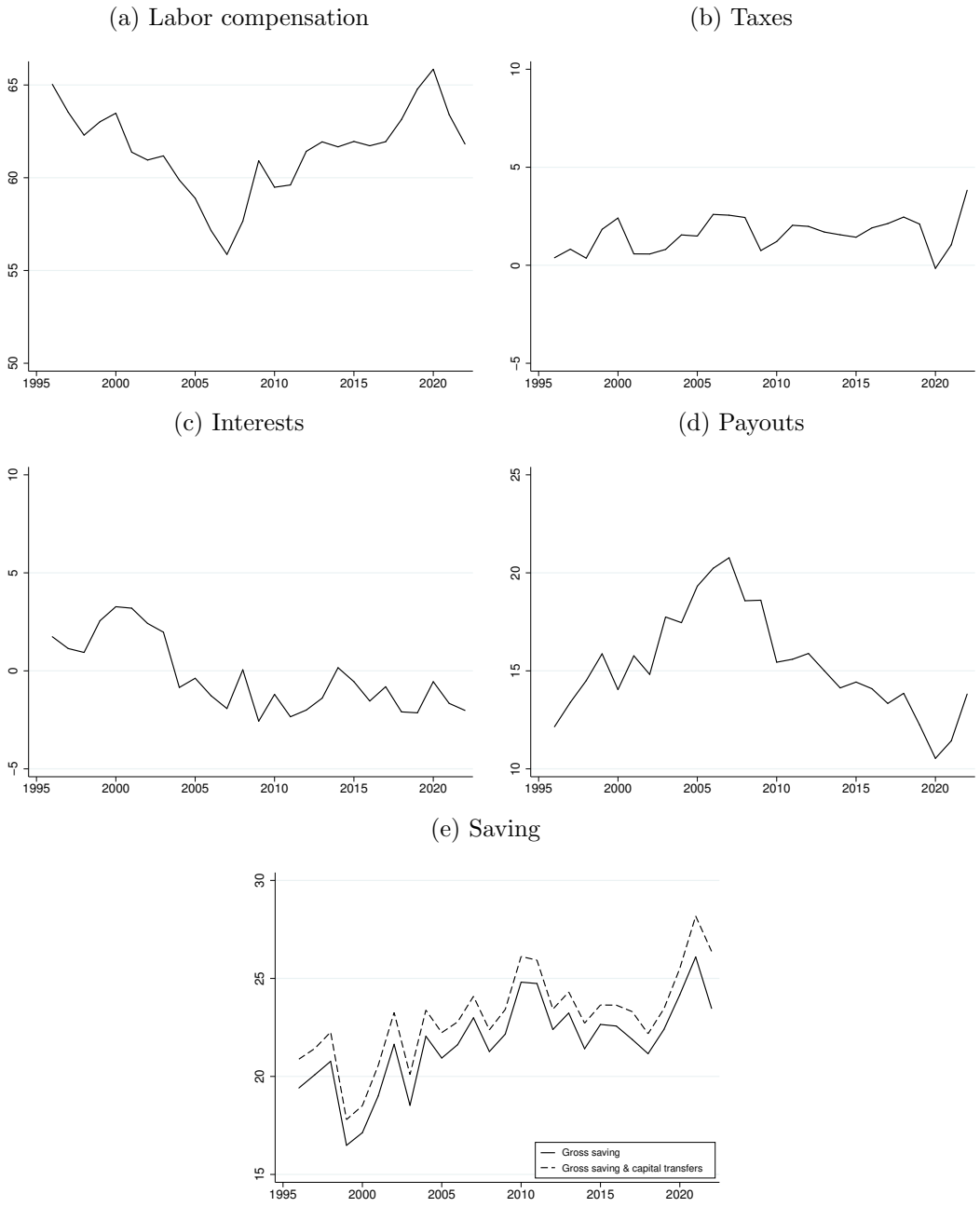
This section turns to the empirical development as depicted in the national accounts drawing on data for the German non-financial corporate sector between 1996 and 2022. Non-financial and financial transactions, as well as assets and liabilities, are sourced from the Eurostat Institutional Sector Accounts Database (Eurostat, 2024). For detailed data on subcategories of GFCF and non-financial assets, supplementary information provided by the Federal Statistical Office is used (Destatis, 2020, 2023, 2024*a*,*b*).[5] For comparison, sector accounts data on four other European countries – Denmark, France, Netherlands, and Spain – are obtained, also sourced from the Eurostat Institutional Sector Accounts Database (Eurostat, 2024).

Figure 3.3 illustrates the development of the main components of GVA in the German corporate sector. The labor share, shown in the top left corner (3.3a), generally constitutes the largest proportion of corporate GVA. Over the observed period, it exhibits, however, remarkable changes. Between 1996 and 2007, it declines from nearly 64 percent to just 55 percent, before recovering to a level similar to the mid-1990s.

Taxes net of subsidies (Figure 3.3b), despite representing only a modest share in GVA,

[5]Since data for the value of land on the sector's balance sheet is unavailable for the years 1996 – 1998, the respective values are extrapolated by fitting a linear trend based on the reported data for the following 10 years.

Figure 3.3: Components as percentage of GVA, non-financial corporate sector



Labor compensation: salaries and benefits expenses. Taxes: taxes on income, production and imports net of subsidies. Interests: Interests, rents, and reinvested earnings on direct foreign investment paid net of interests, rents, reinvested earnings on direct foreign investment, and other investment income received. Payouts: distributed income paid net of distributed income received. Saving: Gross saving and gross saving plus net capital transfers received. *Data:* Eurostat (2024); author's calculations.

display a consistent upward trajectory from under one percent in 1996 to nearly four percent by 2022. Interest payments similarly exhibit an interesting pattern. Surprisingly, while they already account for only a small share in the single-digit percentage range in the 1990s, the sector transitioned to becoming a net recipient of interest income from the early 2000s onward, highlighting the diminishing significance of debt financing in the German corporate sector. Net distributions to shareholders rose from 12 to 21 percent of GVA between 1996 and 2007, before experiencing a pronounced decline coinciding with the financial crisis, ultimately reaching a minimum of just over 10 percent in 2020. Meanwhile, gross saving as a proportion of GVA exhibits a relatively steady upward trend, increasing from 20 percent in 1996 to nearly 25 percent by 2021. Net capital transfers, maintaining a consistent level of roughly 2 percent of GVA annually, provide supplementary internal funding.

These empirical patterns reveal a structural transformation wherein the initial decline in labor share corresponded with simultaneous increases in both distributions to capital owners and gross saving. The subsequent labor share recovery primarily manifested through reduced distributions, while gross saving continued its upward trajectory. Despite clear trends in taxation and interest flows, their relatively modest scale makes them less consequential for overall resource allocation within the corporate sector.

Regarding the deployment of available funds, various expenditure targets can be pursued which fall under more or less narrow definitions of investment: GCF encompasses both GFCF and changes in inventories and valuables, while non-produced non-financial assets – not comprehensively covered in German national accounts – remain outside the scope of the empirical analysis. As shown in Figure 3.4a, GFCF declined by 2 percentage points between 1996 and 2002. Since than, it has been largely stable at around 20 percent of GVA. If GFCF is used as a proxy for investment, as common in macroeconomic literature, we can, therefore, observe largely constant investment spending relative to GVA facing increasing internally retained funds available for financing.

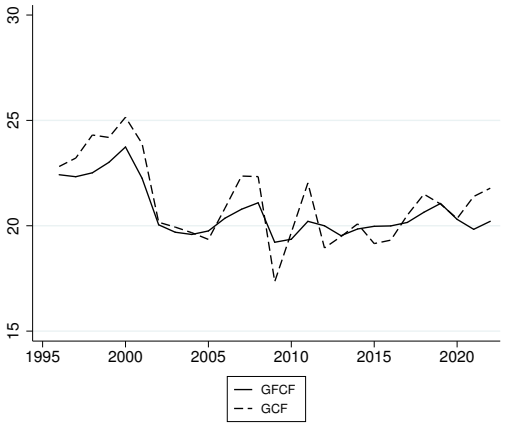
In addition to GFCF, changes in inventories and acquisitions of valuables represent another potential allocation targets. While not directly relevant to investment in the strict sense, especially inventories may influence the financial balance of the sector. As illustrated in Figure 3.4a, their impact – evident in the gap between GCF and GFCF – is

substantial, ranging from -2 percent of GVA in 2009 to nearly 2 percent in 2022.

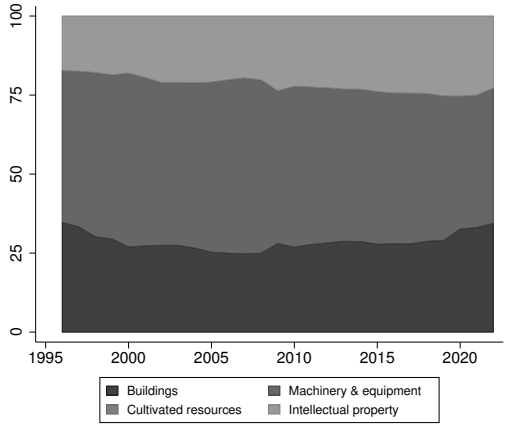
Although GFCF is typically treated more or less as a single, uniform flow in the macroeconomic context, it encompasses different subcategories. A shift in the proportion of expenditures across these various categories may have implications for the overall development of the sector and could potentially offer explanations for other observed trends. Therefore, the individual subcategories are shown in Figure 3.4b.

Figure 3.4: Investment, non-financial corporate sector

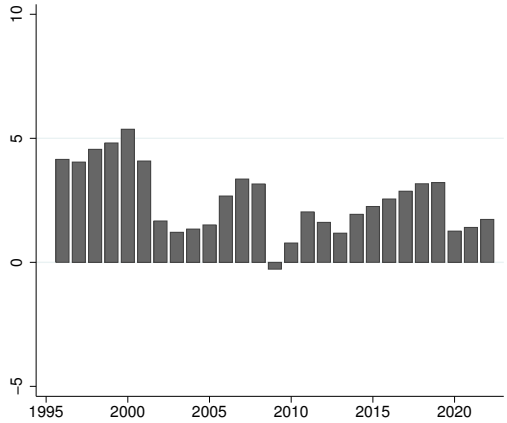
(a) Gross (fixed) capital formation



(b) Subcategories of GFCF



(c) Net fixed capital formation



Gross fixed capital formation (GFCF) and gross capital formation (GCF) in the non-financial corporate sector, both as a percentage of GVA. Different subcategories of GFCF as percentage of total GFCF. Net fixed capital formation as percentage of GVA. *Data:* Eurostat (2024); Destatis (2024*a*,*b*); author's calculations.

Spending on buildings, initially comprising almost 35 percent of GFCF, declined to under 25 percent by 2007 before recovering to mid-1990s levels by 2022. In contrast, the share of GFCF allocated to machinery and equipment increased moderately until 2008, from 48 to roughly 56 percent of GFCF, before experiencing a substantial 13 percentage point reduction to approximately 42 percent of GFCF at the end of the observation period. Conversely, spending on intellectual property, mainly comprising R&D expenditures, expanded from 17 percent to 25 percent of GFCF by the 2020s.[6]

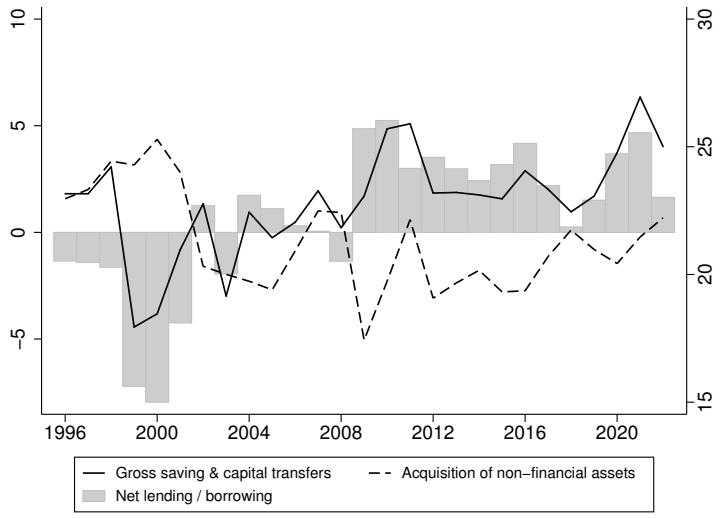
Given that total GFCF has been stagnating since the early 2000s, these trends are also reflected in relation to GVA indicating a shift in investment patterns, with a notable decline in tangible investments and a rise of the intangible economy. However, the extent of this shift is less pronounced than anticipated, or observed in other countries (e.g., Haskel and Westlake, 2018), underscoring the continued significance of manufacturing in Germany's economy.

Finally, Figure 3.4c shows the evolution of GFCF net of consumption of fixed capital. Since this measure accounts for both additions to fixed capital and the depreciation or degradation of respective assets, it directly reflects the evolution of the capital stock. While maintaining positive values throughout the period – with the exception of a single instance in 2009 – it declined from 4 to 5 percent of GVA in the 1990s to less than 2 percent by 2022. This indicates that, while the capital stock in the corporate sector is increasing, its growth decelerated substantially over the past decades.

The trends described ultimately shape the financial balance of the sector. As shown in Figure 3.5, net lending/borrowing – the difference between internal funds and the acquisition of non-financial assets – was strongly negative in the 1990s, reaching a deficit of 8 percent of GVA in 2000. Since then, the balance has risen significantly, fluctuating around a neutral level in the early 2000s, before showing sustained surpluses following the financial crisis. Over recent decades, the corporate sector has thus transitioned from being a net borrower, as is typically expected for corporations even in aggregate, to a net lender to the rest of the economy. These surpluses are not only persistent but also substantial, reaching as much as 5 percent of GVA.

[6]The remaining subcategory, cultivated resources, including crops and livestock, has no significance for the German corporate sector. Accounting for well below 1 percent of GFCF, spending on this category is virtually invisible in Figure 3.4b

Figure 3.5: Saving, investment, and financial balance, non-financial corporate sector



Gross saving, acquisition of non-financial assets, and net lending/borrowing in the non-financial corporate sector as percentage of corporate GVA. *Data:* Eurostat (2024); author's calculations.

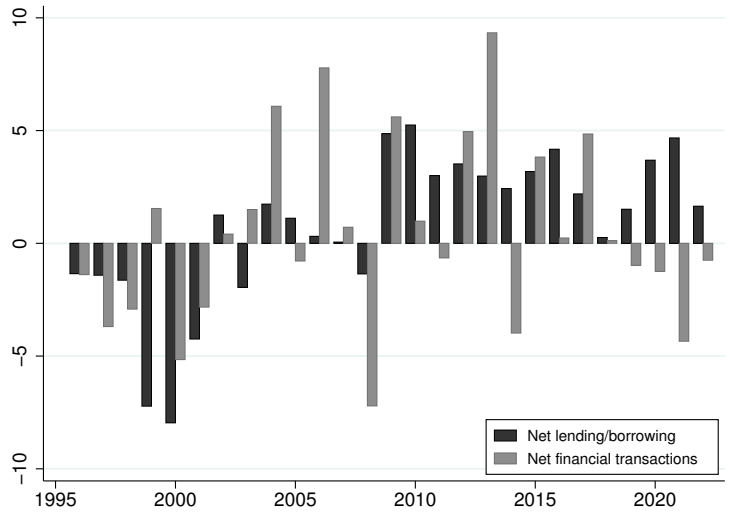
As described, the trend, particularly the transition from net borrower to net lender, is primarily due to rising gross saving amid stagnating gross investment. However, capital transfers, mainly in the form of investment grants from the German government, also play a role. As depicted in Figure 3.3e, these grants account for around 2 percent of GVA annually. Without these flows, the deficit in the 1990s would have been significantly larger, and the surplus in the 2010s notably smaller. In some surplus years, the financial balance would even have turned negative without them. Thus, the substantial and persistent financing surplus in the corporate sector is partly a consequence of inflows from the general government which, at the aggregate level, were not accompanied by sufficiently higher investment.

The financial balance of the corporate sector suggests that in recent years up to 5 percent of value added by German companies each year is neither redistributed as income to other sectors nor invested, but instead flows into the acquisition of financial assets. Since not only the household sector but also the government and financial corporations in Germany have, primarily, run surpluses during this period (Eurostat, 2024), this suggests that Ger-

man non-financial firms have, on a large scale, accumulated claims against foreign entities. This raises the question which types of claims have been acquired.

Some studies highlight a correlation between corporate net lending and increasing cash holdings (e.g., Dao and Maggi, 2018). This emphasis is partially justified, as a financial surplus may lead to increased cash reserves when firms keep excess savings as liquidity. It is, however, not a necessary connection. Conceptually, a positive net lending position signifies the accumulation of financial assets, among which cash is merely one category – and far from the most significant. Financial asset accumulation may also involve the acquisition of equity or debt securities, or it may stem from claims arising from operational activities, such as trade receivables. The interpretation of such surpluses can vary considerably depending on how these financial flows are allocated across different asset classes.

Figure 3.6: Corporate net lending/borrowing and net financial transactions, non-financial corporate sector



Net lending/borrowing and net financial transactions of the non-financial corporate sector, both in percentage of corporate GVA. *Data:* Eurostat (2024); author's calculations.

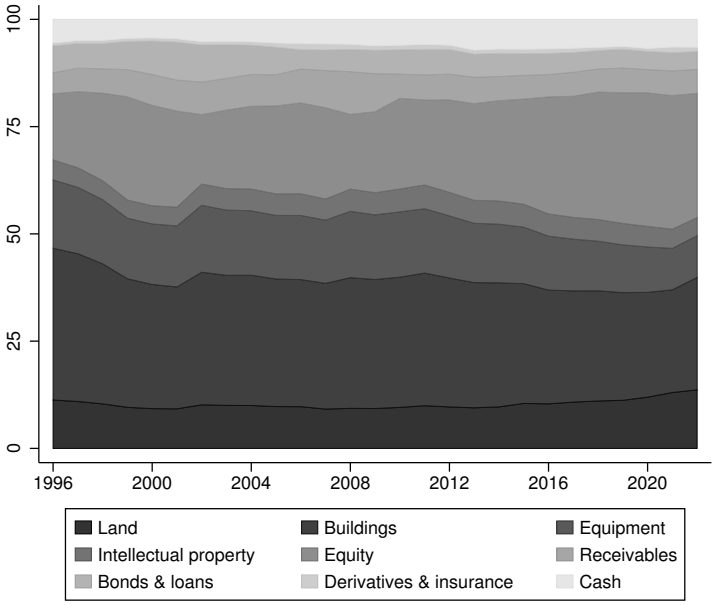
As discussed in the previous section, net financial transactions in the national accounts should provide insight into how the sector's surplus is utilized. Figure 3.6 compares net lending/borrowing to the net financial transactions as recorded in the financial accounts provided by the German *Bundesbank*. Surprisingly, the two indicators show no alignment whatsoever. Not only do they differ substantially in magnitude, but the expected trend

is only partially apparent in financial transactions. Instead, they display an extremely volatile pattern, which appears largely implausible. This discrepancy evidently reflects a data issue, though the underlying reasons remain unclear at first glance. These data limitations, which will be discussed in detail in Chapter 6, suggest that national accounts data do not allow for meaningful conclusions regarding the allocation of the financing surplus of the German corporate sector. Thus, we must acknowledge that, at the macro level, the destination of this surplus remains unclear.

Even though the financial transactions have limited informational value, it is worth examining how the composition of the balance sheet has changed. Figure 3.7 depicts the development of different asset classes as percentage of total assets of the sector. First, it can be noted that the share of non-financial assets has declined over time. In particular, the share of the capital stock, buildings, machinery and equipment, and intellectual property, has fallen significantly from 56 percent of total assets in 1996 to 40 percent in 2022. As detailed earlier, this decline is, however, not due to a shrinking capital stock. Although investment net of consumption of fixed capital has decreased over time, the capital stock still grows in absolute terms. Rather, the relative decline is driven by a stronger increase in other assets.

Interestingly, this shift primarily affects only one category of financial assets. While the shares of cash holdings, derivatives, insurance and pension assets, bonds, loans, and other receivables have remained nearly unchanged, the proportion of equity and investment fund shares has risen substantially. This trend gained momentum particularly after the financial crisis when the share of equity rose from 21 percent of total assets in 2010 to 29 percent in 2022. The upswing in the share of equity coincides with a period of unprecedented value increases especially in publicly traded stocks (e.g., Kuvshinov and Zimmermann, 2022). Accordingly, the financial accounts indicate that this increase in equity holdings has been driven in part by rising valuations. However, this is not solely a revaluation effect. Transaction data also show that companies in the sector have made substantial purchases of equity and investment fund shares. This may suggest that the sector's large and persistent financial surplus was primarily directed toward equity investments. Since the surplus, as described above, most likely flows predominantly abroad, it is likely that German firms are primarily acquiring equity in foreign companies.

Figure 3.7: Assets, balance sheet, non-financial corporate sector

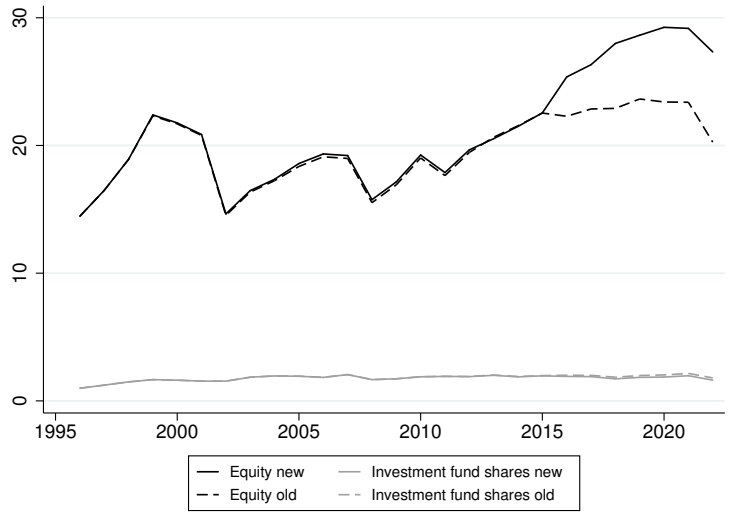


Different categories of assets as percentage of total assets of the non-financial corporate sector. Non-financial assets: land, buildings and structures, machinery and equipments (including cultivated resources), intellectual property. Financial assets: equity (including investment fund shares), other accounts receivable, bonds and loans, financial derivatives and insurance assets, currency and deposits. *Data:* Eurostat (2024); Destatis (2023); author's calculations.

However, this interpretation should be approached with caution, as Germany's financial accounts appear to have notable data issues. In 2024, the *Bundesbank* conducted a revision of financial accounts data, incorporating a revaluation of equity using an updated methodology (Deutsche Bundesbank, 2024*d*). This revision led to a substantial upward adjustment of the reported value of equity held by the corporate sector, which had been implausibly low in previously published data (see Chapter 6 for a detailed discussion). Yet, the revision could only be applied back to 2016, according to the *Bundesbank* due to limitations in raw data availability, resulting in a statistical break between 2015 and 2016.

Figure 3.8 shows the time series before and after the 2024 revision. First, it can be observed that investment fund shares represent only a small fraction, with negligible change resulting from the revision. The majority of equity is held directly by the corporate sector, encompassing listed and unlisted shares, as well as equity in privately held firms. A significant upward trend in this area is clearly visible in recent years, largely driven by

Figure 3.8: Equity assets, balance sheet, non-financial corporate sector



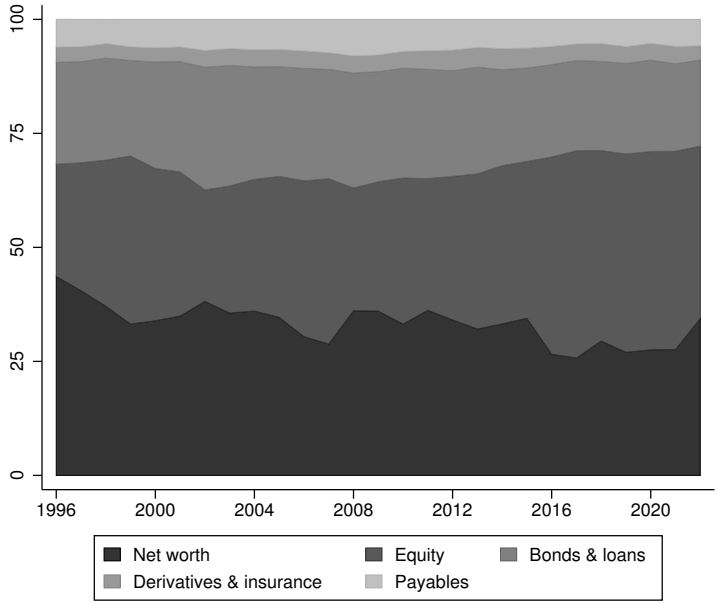
Equity and investment fund shares as assets of the non-financial corporate sector as percentage of total assets before (old) and after 2024 revision (new). *Data:* Eurostat (2024); Deutsche Bundesbank (2024*b*); author's calculations.

revaluation adjustments starting in 2016. While this revaluation seems more plausible, the break in the time series means we cannot determine how equity might have developed in prior years if comparable estimates had been available for those periods. Consequently, it remains unclear to what extent the observed increase reflects substantial equity acquisitions by the corporate sector – potentially as a result of the persistent financial surplus – or if it is instead an artifact of the time series break. Thus, it is uncertain whether the sector's surpluses are genuinely being allocated in this manner.

Regarding the other side of the balance sheet, the composition of liabilities has similarly undergone substantial changes, as illustrated in Figure 3.9. While the shares of payables, financial derivatives, and insurance and pension entitlements remained stagnant at a low level relative to total assets, the share of typical debt financing instruments, namely corporate bonds and loans, has significantly declined in recent years, from a peak of 27 percent of total assets in 2002 to just 19 percent in 2022. Conversely, the share of equity expanded from a minimum of around 24 percent in 2002 to over 43 percent in 2021, before declining slightly again. This shift from external to internal financing generally aligns well with the rise in corporate saving recorded in transaction data.

It seems possible that the equity expansion on the liability side is similarly attributable to

Figure 3.9: Liabilities, balance sheet, non-financial corporate sector



Different categories of liabilities as percentage of total assets of the non-financial corporate sector: Equity, bonds and loans, financial derivatives, insurance and pension entitlements, other accounts payable, and net worth. *Data:* Eurostat (2024); author's calculations.

the financial accounts revision. If this is the case, the time series without statistical break would instead depict a corresponding increase in residual net worth. Such a trend would still be consistent with the increase in gross saving regardless of utilization. However, as previously noted and as will be discussed in detail in Chapter 6, the high proportion of net worth raises a conceptual issue.

In summary, over recent decades the German non-financial corporate sector exhibited a development where the labor share experienced a notable decline until 2007, followed by a recovery, while taxes and net interest payments, though minor in scale, showed steady increases and decreases, respectively. Payouts to shareholders peaked in 2007 but declined after the financial crisis, coinciding with a gradual increase in corporate gross saving. Gross investment remained stable since the early 2000s and net investment decreased over the whole period, despite rising internal funds available for financing. Additionally, shifts in GFCF components indicate a move from tangible assets toward intangible assets. As a result of these developments, the corporate sector's financial balance transitioned from net

borrowing to net lending. Despite data limitations obscuring a complete understanding of the allocation of funds, the national accounts suggest that financial surpluses largely flow into the acquisition of equity, most likely in foreign companies.

These developments have significant implications across various areas. The first key aspect is the critical role of the labor share in the personal income distribution. The remarkable decline in the labor share indicates that the portion of income received by the broad population, which relies primarily or exclusively on labor earnings, has decreased. In contrast, the simultaneous rise in payouts to shareholders suggests that incomes at the top of the distribution have increased, as company owners – due to the concentrated ownership of business assets – are predominantly found among the wealthiest individuals.[7] The subsequent recovery of the labor share and the fall in distributed profits points to the opposite development in more recent years.

Second, the current account surplus of the German economy is directly linked to the rise of corporate net lending. The fact that the household sector generally records a surplus makes the transition from corporate net borrowing to net lending particularly significant, and it positions the change in the corporate flow of funds as one of the main determinants of the evolution of the current account in Germany. An investigation into the underlying factors driving the development of the corporate flow of funds would therefore be crucial in gaining a better understanding of the current account.

Third, it is crucial to understand what happens to the funds that constitute the surplus of the corporate sector. Even if the surplus has been directed toward the acquisition of equity, which cannot be definitively determined with available data at the macro level, this should lead to different interpretations depending on the manner and context of these transactions. For example, if companies primarily make short-term equity investments, this could suggest a form of liquidity holding, similar to cash. This raises the question of why firms would be building increasing liquidity buffers. On the other hand, an increase in equity as a result of the surplus would have very different implications if it involved companies or shares in companies directly linked to operational activities. This could potentially indicate a shift in strategic direction toward diversification and international-

[7] Existing estimates suggest that business assets in Germany are almost exclusively owned by the top 10 percent of the wealth distribution, with the majority concentrated in the top 1 percent (e.g. Schröder et al., 2020; Deutsche Bundesbank, 2022).

ization, which is reflected in the national accounts as a financing surplus of domestic firms.

These implications raise several important questions that cannot be answered using national accounts data. First, what are the underlying causes of the decline in the labor share and the rise in corporate saving? Before identifying causal factors, it is essential to examine the firm-level dynamics that have shaped these trends. Interpretations could vary significantly depending on the underlying patterns that have driven macro-level developments. Second, are the developments in the aggregate flow of funds a reflection of similar trajectories in individual firms or are distinct groups of firms responsible to for the developments of different components of GVA? A closer look at the behavior of individual firms could provide insights in this regard. Third, it remains unclear which financial transactions constitute the surplus. Since macro indicators, due to their nature and data limitations, cannot provide answers to these questiones, the following chapters will explore these developments using firm-level data.

4. Disaggregating Macro Trends

While a detailed analysis of the national accounts time series provides valuable insights into the specific developments within the corporate sector, it sheds little light on the underlying mechanisms driving these changes. To address this, firm-level data is used in this chapter to disaggregate the observed trends and identify key influencing factors by reconstructing broader trends and progressively breaking them down to the level of individual firm behavior.

For an ideal analysis, microdata encompassing all firms within the corporate sector would be required. Additionally, such data should closely resemble national accounts, particularly in reflecting only domestic economic activity. Unfortunately, such comprehensive data are not available. Instead, the following analyses rely on accessible information on publicly listed companies in Germany.

This approach entails some limitations in generalizing the findings to the entire non-financial corporate sector. First, although not all publicly listed companies in Germany are particularly large, and not all privately held firms are necessarily small, publicly listed firms are, on average, larger than privately held firms. Second, the corporate sector as a whole is less concentrated in manufacturing since service firms are typically smaller and less frequently listed. Third, financial information for these firms represent consolidated data which includes activities of foreign subsidiaries.

Despite these constraints, the sample constitutes the most comprehensible available data source and provides a solid representation of the sector, particularly concerning the macroeconomic significance of sample firms. In 2022, the aggregate GVA of sample firms exceeded 800 billion Euros, while the national accounts report slightly less than 2,300 billion euros in GVA for the non-financial corporate sector in the same year. Therefore, it seems reasonable to conclude that listed firms in Germany significantly influences the overall development of the sector.

4.1 Firm-Level Financial Data

Consolidated financial statement data for German publicly listed firms between 1993 and 2022 are obtained from the *Worldscope* database via *LSEG Workspace*.[1] Financial firms, including but not limited to banks and insurance companies, as well as real estate firms are excluded to match the composition of the non-financial corporate sector as close as possible. The raw data include 1243 individual firms.

The financial data encompass information derived from the firms' income and cash flow statements, as well as their balance sheets.[2] Additionally, other characteristics such as employment numbers, founding years and SIC codes are included. Unfortunately, the raw data exhibit frequent gaps with regard to variables central to this analysis. To be able to include as many companies as possible, two strategies are applied.

First, missing values are replaced by manually collected information from financial statements available online. This primarily concerns salaries expenses and employment numbers, which are generally not well covered in the *Worldscope* database, but in some cases also dividend payments, capital expenditures, income taxes, and interest payments. However, not all gaps can be closed by this procedure, as financial statements cannot be obtained for all companies and years which exhibit gaps in the respective variables.

Second, for some variables, missing values are treated as zero. In contrast to other variables, these items are not necessarily reported in the companies' financial statements. As a result, zero values are usually not reported at all which may have led to a particularly high number of missing values in the *Worldscope* database. Therefore, it seems reasonable to assume that missing values generally correspond to zero. Alternatively, excluding all firms with missing values would likely create a bias by excluding the majority of firms not engaged in the respective activities. This procedure applies, in the case of flow variables, to R&D expenditures, share buybacks, interest income, and dividend income and to all balance sheet items except total assets, total liabilities and shareholders' equity. All firm/year combinations that still have missing values for financial variables after these

[1] The financial data, denominated in euros, correspond to the fiscal year of the companies; if their fiscal year differs from the calendar year, the data is interpreted as reflecting the firms' activity during the corresponding calendar year.

[2] A full list of variables obtained from *Worldscope* is provided in Table A.1 in Appendix A.

procedures are excluded. Moreover, firms which are consolidated subsidiaries of other firms in the sample are excluded to avoid double counting in aggregate measures. These procedures reduce the number of firms to 1091.

In addition to financial flow variables and balance sheet items, a number of supplementary variables is obtained from *Worldscope*: Market capitalization is used as a proxy for the firms market value in the respective year. Stock prices at the end of each month for all companies and years are obtained to calculate firms' stock price volatility as the standard deviation of the monthly prices in each year. SIC codes are used to group firms into 12 industries, 5 of which are manufacturing subsectors.[3]

Finally, founding years are included in the dataset. However, the raw data present a challenge in this respect, as they contain a high number of missing, as well as false or at least implausible values. For example, firms created trough mergers are often assigned the year of the merger as founding year. Although this is technically correct, it seems misleading, as companies which have been operating for a long time are considered to be newly established. For other firms, the data shows the year of the IPO instead of the founding year. This represents a serious distortion, especially in the German context, as German firms often exist for a long time before they are listed at a stock exchange. These inadequacies are corrected by manually checking all values and replacing them if necessary based on publicly available sources such as company websites, financial statements and newspaper articles. In the case of firms created through mergers, the founding year of the oldest original firm is used.

Since the following analyses are intended to explore the underlying mechanisms behind the macro developments, indicators are used that closely align with those employed at the macro level. However, replicating national accounts measures at the firm level poses challenges due to important differences between the national accounts and firm-level accounting. Crucially, a number of variables central to the analysis, including gross value added, gross saving, and net lending/borrowing, are not standard accounting items on the firm level and are not available in *Worldscope*. Therefore, alternative items are relied upon to construct the variables of interest.[4]

[3] A detailed breakdown of the group composition is included in Table A.2 in Appendix A.

[4] The construction of the flow variables largely follows the procedures used by Chen et al. (2017).

To begin with, gross value added is approximated as the sum of labor compensation and gross operating surplus (GOS):

$$GVA = Labor\,Compensation + GOS \tag{4.1}$$

where GOS is defined as earnings before interests, taxes, and depreciation plus R&D expenditures:[5]

$$GOS = EBITDA + R\&D \tag{4.2}$$

In a next step, gross saving is defined as GOS minus income taxes, interest expenses net of interest income, and payouts to shareholders:

$$Gross\,Saving = GOS - Income\,Taxes - Net\,Interests - Payouts \tag{4.3}$$

where payouts are defined as dividends paid, net of dividend income, plus share buybacks:

$$Payouts = Net\,Dividends + Buybacks \tag{4.4}$$

Excluding buybacks from the measurement of gross saving and categorizing them as payouts instead is a deviation from the national accounts. Share buybacks represent a flow comparable to dividends, and treating them differently would underestimate the true extent of the flow of payments to shareholders (Gruber and Kamin, 2016).[6] Next, investment spending at the firm level is defined as the sum of capital expenditures and R&D, which is roughly equivalent to GFCF in the national accounts:

$$Investment = Capital\,Expenditures + R\&D \tag{4.5}$$

Since *Worldscope* does not provide information on investment grants and other capital transfers, the financial balance of the respective firm is solely calculated as gross saving minus investment:

[5]Note that R&D is not categorized as investment in firm-level accounting and is therefore deducted from earnings. It is added back to better match the definition in the national accounts, where R&D is part of the investment flows subsumed under GFCF.

[6]In the national accounts, share buybacks are not deducted from gross operating surplus, but are a part of net lending, as they technically represent an acquisition of financial assets.

$$Net\,Lending\,/\,Borrowing = Gross\,Saving - Investment \tag{4.6}$$

Regarding balance sheets, the main difference between firm-level and national accounts lies in the grouping of individual items. Once again, the individual items used in this analysis are defined to enable approximate comparability with macro-level indicators. Starting with the asset side of the balance sheet, various items are consolidated into seven main categories: four types of non-financial assets and three types of financial assets. The first category encompasses physical capital. Unlike in national accounts, firm-level accounting does not allow for a detailed breakdown into subcategories such as equipment or buildings, as these asset classes are usually grouped under Property, Plant & Equipment (PPE), a standard item available in *Worldscope*.[7] The second category comprises inventories which are not included in the national accounts balance sheets for Germany (Destatis, 2023) but are included in the firm level analysis since they constitute a sizable part of total assets. The third category encompasses intangible assets such as software or patents and is calculated as:

$$Intangible\,Assets = Total\,Intangible\,Assets - Goodwill \tag{4.7}$$

Although it is typically included in intangibles in firm-level accounting, goodwill is presented here as a separate category due to its increasing importance which will be discussed later.

Financial assets are divided into three main categories. The first category is comprised of receivables including trade receivables, representing claims against customers for goods or services that have been delivered and invoiced but remain unpaid, as well as other receivables, including but not limited to outstanding loans or bonds held. The total value of receivables is calculated as the sum of short-term and long-term receivables:

$$Receivables \;=\; Short{-}Term\,Receivables + Long{-}Term\,Receivables \tag{4.8}$$

[7]Note that PPE also includes physical but non-produced assets, i.e. land, which represents a significant difference to the national accounts.

The second category comprises other financial assets, including but not limited to long-term equity investments and investments in associated companies, calculated as:

$$\begin{aligned} Other\,Financial\,Assets \;=\; & Investments\,in\,Associated\,Companies \\ & + Other\,Investments \end{aligned} \tag{4.9}$$

The last group of financial assets comprises cash and cash equivalents, an item readily available in *Woldscope*.

The liability side of the balance sheet is grouped into five categories. Payables comprise various types of outstanding payments which represent a liability to respective firms and are calculated as the sum of different payable items available in *Worldscope*:

$$\begin{aligned} Payables \;=\; & Income\,Taxes\,Payable + Dividends\,Payable \\ & + Accrued\,Payroll + Other\,Accounts\,Payable \end{aligned} \tag{4.10}$$

Data on total debt, encompassing bonds issued by the companies and loans they have taken out, can be obtained directly from *Worldscope*, as well as data on provisions for risks and charges. Finally, shareholders' equity is divided into retained earnings and other equity calculated as:

$$Other\,Equity = Total\,Equity - Retained\,Earnings \tag{4.11}$$

The final dataset excludes firm/year combinations for which the calculations yield negative values for GVA, as well as firms without employees or labor compensation, and is comprised of 13,061 observations for 1068 individual firms between 1993 and 2022.

Table 4.1 presents key characteristics of all firms included in the dataset, broken down by industry. The sample is heavily concentrated in manufacturing, with nearly half of the firms operating in this sector. In general, sample firms tend to be relatively old, except for those in the information and communication sector, and to a lesser extent, in services, where firms are younger on average. Firm size also varies widely across industries, whether measured by sales, assets, or employment. The largest firms are found in the transportation equipment sector, which includes Germany's major car manufacturers, while the smallest are in agriculture and electronics industries.

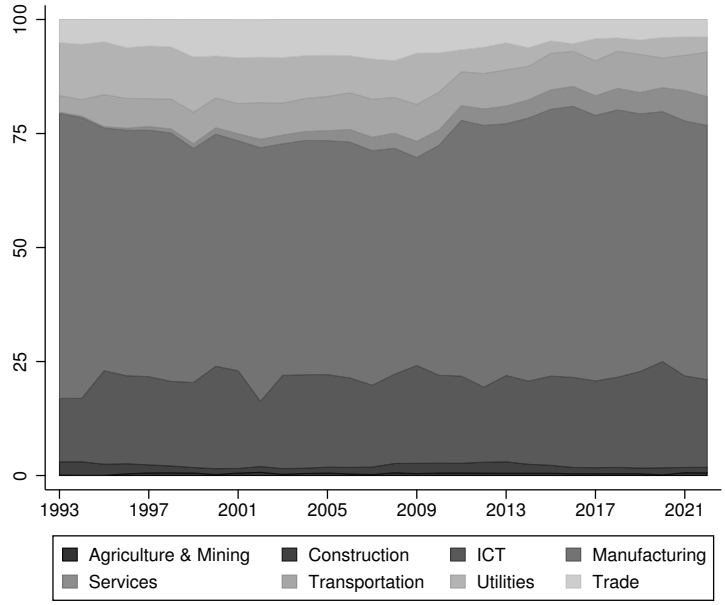
Table 4.1: Key characteristics of sample firms

Industry	Firms	Age	Sales	Assets	Employees
Agriculture and mining	15	101	0.87	1.06	2,662
Construction	32	93	2.44	2.05	12,671
Information & communication	193	26	2.51	4.18	11,444
Total manufacturing	516	82	3.13	4.10	10,975
Chemical & pharma	61	81	6.16	7.90	20,424
Electronics	107	47	0.53	0.56	2,939
Transportation equipment	41	86	20.71	30.99	60,130
Rubber, plastic, glass, metal	86	102	2.10	1.97	10,533
Other manufacturing	221	88	0.67	0.63	3,235
Services	131	37	0.61	0.91	4,786
Transportation	28	89	6.87	9.50	46,311
Utilities	48	81	8.18	13.43	14,108
Wholesale / retail trade	103	71	4.05	2.22	15,391
Total	1068	68	3.12	4.05	11,944

Column 1 shows the number of firms per industry included in the dataset. Columns 2-6 show average characteristics by industry. Sales and assets in billions of Euros.

As argued earlier, the German corporate sector exhibits remarkable structural persistence across multiple dimensions. The continuity manifests particularly clearly in the distribution of GVA across industries. Despite substantial fluctuations in the number of corporations – ranging from 309 in 1993 to a peak of 563 in 2005 – the sectoral composition of GVA, as illustrated in Figure 4.1, has changed only moderately. While the shares of service and information and communication industries have increased, accompanied by a corresponding contraction in utilities' share, these shifts appear notably modest given the magnitude of global economic restructuring over the three-decade observation period. Among German publicly listed non-financial firms, the relative significance of traditional sectors, particularly manufacturing, has maintained remarkable stability, underscoring the persistence of established industrial structures despite broader global economic realignment.

Figure 4.1: Aggregate gross value added over industries, publicly listed firms



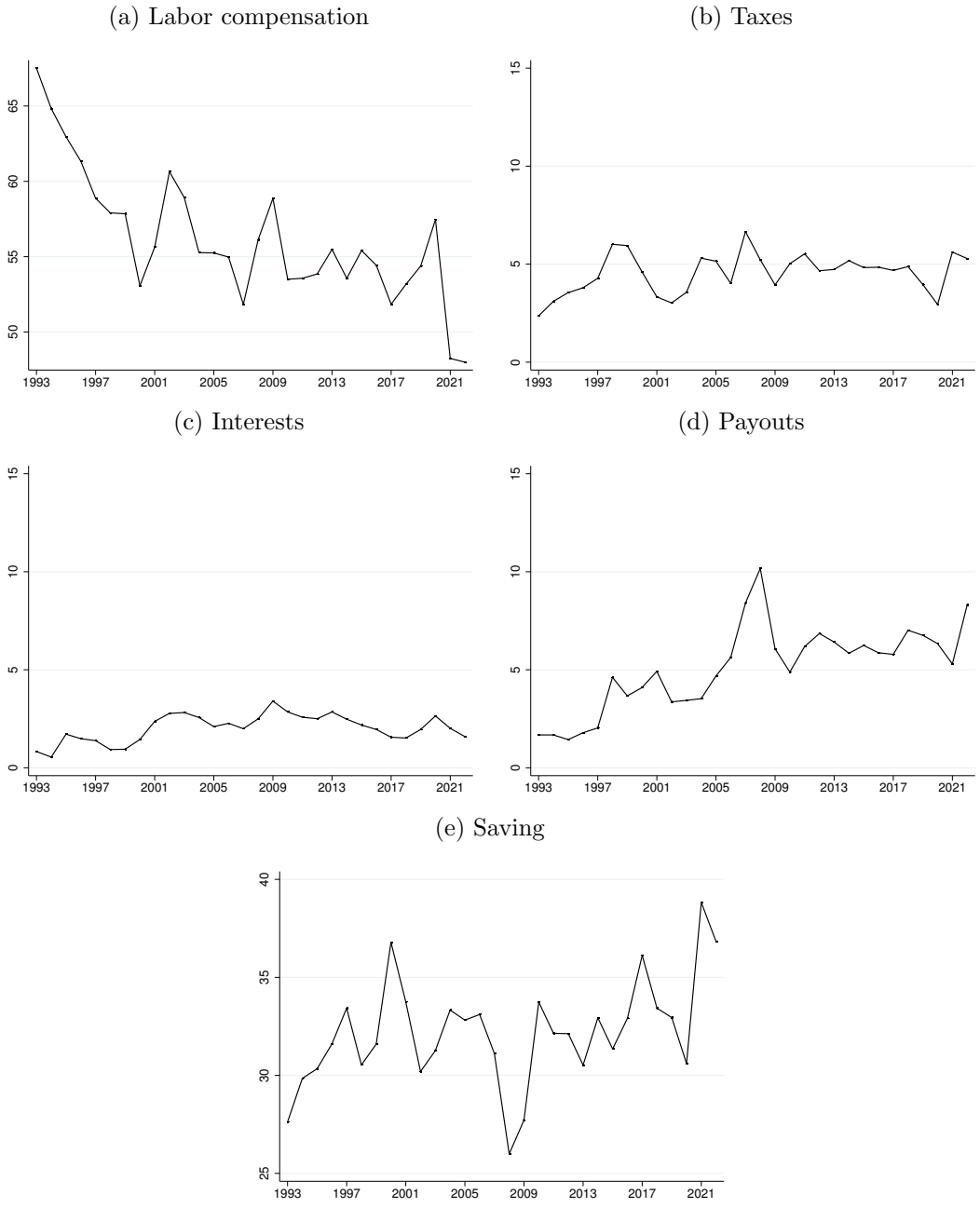
GVA in different industries as percentage of total GVA of all sample firms.
Data: Worldscope; author's calculations.

4.2 The Flow of Funds among Publicly Listed Firms

Turning to the aggregate flow of funds, Figure 4.2 shows the development of the components of aggregate GVA among sample firms. The aggregate labor share shows a remarkable decline of 20 points between 1993 and 2022, from 68 to 48 percent of GVA. Taxes and interest payments have been relatively stable at around 5 and 2 percent of GVA, respectively. Payouts to shareholders have increased almost fivefold between 1993 and 2022, from less than 2 to more than 8 percent of GVA. Gross saving increased by almost 10 percentage points of GVA. Overall, the trends paint a picture in which the labor share at the aggregate level has fallen significantly, largely offset by an increase in gross saving and, to a smaller extent, by a rise in payouts.

Comparing these trends to the developments depicted in Figure 3.3 reveals broad commonalities between the evolution of aggregate firm-level measures and macro trends but also notable differences. First, the labor share exhibits a similar decline in the 1990s and 2000s, albeit even more pronounced in firm-level data. However, unlike in macro data, no

Figure 4.2: Components as percentage of GVA, publicly listed firms



Aggregate components as percentage of aggregate GVA of sample firms: labor compensation (salaries and benefits expenses), taxes on income, interests calculated as interest expenses on debt net of non-operating interest income, payouts calculated as cash dividends paid and share buybacks net of non-operating dividend income, and gross saving. *Data:* Worldscope; author's calculations.

subsequent rebound of the labor share is observed in the firm sample. Instead, it remains at a lower level before dropping even further toward the end of the sample period. In line with this differing development, the share of payouts in firm-level data rises steadily throughout the entire period, without the subsequent decline after the financial crisis observed at the sector level in national accounts data.

Similar to the macro trend, taxes account for only a modest share of GVA. The share of net interest payments, however, does not decline in the firm sample. In contrast to the entire sector, the aggregate net interest payments of publicly listed firms even increase slightly relative to GVA and remain positive throughout the entire period, albeit at a low level. Gross saving, on the other hand, shows similar trends in both macro and micro data. However, gross saving of publicly listed firms consistently accounts for a higher share of GVA, likely due to the average size of sample firms. Moreover, the increase is more pronounced, reflecting the sharper decline in the labor share.

In summary, we observe similar trends, except that the rebound in the labor share at the expense of distributed profits is not present among publicly listed firms meaning that these specific developments cannot be directly traced using available micro data. While the source of the discrepancy remains unclear, one possibility seems particularly noteworthy. The most obvious explanation is that the rebound in the labor share has been driven by companies that are part of the sector but not included in the firm sample, namely privately held firms. This would imply that such firms experienced a significant rise in the labor share in recent years. It would also explain why the increase in corporate saving in the national accounts appears largely unaffected by the labor share's trend reversal, simply because different groups of firms are responsible for the respective developments.

While publicly listed companies, on aggregate, exhibit a steadily declining labor share primarily associated with rising gross saving, all other companies, on aggregate, should display a labor share primarily correlated with the evolution of payouts. At first glance, this seems plausible. Smaller firms, which are much more prevalent among privately held companies, are likely to have less differentiated cash flows. Whatever remains after covering wages is more likely to be distributed as payouts in smaller companies, as their owners may have undiversified wealth portfolios and may rely on income from respective payouts (e.g., Isakov and Weisskopf, 2015). A wider range of options for using profits – common

in larger firms – may simply not be realistically available to smaller businesses. This interpretation aligns with the higher overall level of payouts in the entire sector compared to publicly listed firms. Even at the trough of payouts in 2020, they accounted for over 10 percent of GVA, which was still several times the average observed over the whole period in the firm sample.

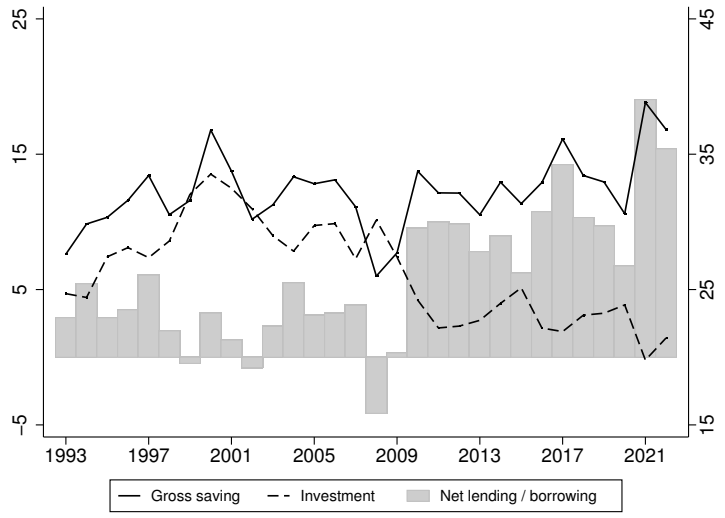
Such an interpretation may also be plausible considering that it seems likely that privately held firms – especially small ones and those operating in the service sector – are influenced by different factors than large publicly listed companies. One example in this context may be the introduction of a general minimum wage in Germany in 2015. In companies where a significant portion of the workforce received wage increases as a result, the labor share is likely to have increased. However, in publicly listed firms, which are heavily concentrated in manufacturing, the minimum wage is unlikely to have played a direct role since wages in these companies were already relatively high in absolute terms, meaning the number of employees earning wages near the threshold would have been comparatively small. Consequently, the impact of such policy measures on the labor share in this firm sample would likely have been minimal. All of this, however, remains speculative and serves merely to illustrate that a diverging trend is not inherently implausible.

Overall the interpretations should be approached with caution. Micro data, as described above, are not directly comparable to national accounts. The latter adhere to a domestic principle, while firm-level accounting data are consolidated at the group level, which includes foreign subsidiaries. Consequently, the trends observed for sample firms could also reflect developments abroad, at least for companies with sizable international operations. As long as micro data which directly matches the national account aggregates is unavailable, it is difficult to make definitive statements. It seems however reasonable to assume that the decline in the labor share and the increase in saving over the entire period were strongly driven by publicly listed companies.

Turning to aggregate investment and the financial balance of sample firms, Figure 4.3 shows the evolution of gross saving next to the development of aggregate investment and net lending/borrowing. What stands out immediately is that investment relative to GVA for the firm sample has significantly decreased, in contrast to the macro level, where it has remained relatively stable. While gross saving initially follows a similar trend, a widening

gap emerges starting in 2010. Gross saving rises and investment declines leading to a large financial surplus of up to 19 percent of GVA in 2021. Interestingly, the aggregated financial balance remains positive throughout the entire period, with only a few exceptions. Nevertheless, we observe a notable increase, similar to the sector trend, but at a generally higher level. Hence, while the details may vary, the macro trend, particularly the shift from net borrower to net lender, can be associated with sample firms.

Figure 4.3: Aggregate saving, investment, and financial balance, publicly listed firms



Aggregate gross saving and investment (right axis) and net lending (left axis) as percentage of aggregate GVA. *Data:* Worldscope; author's calculations.

The following analysis will examine the firm-level patterns that have determined the development of aggregate measures focusing, first, on the labor share before subsequent sections examine the use of accounting profits and the allocation of retained funds.

4.3 Firm-Level Patterns behind the Labor Share Decline

Technically, there are four broader categories of micro-level patterns which result in a declining aggregate labor share. First, the distribution of value added across firms remains stable, while individual firms' labor shares decline on average. This pattern suggests a relatively uniform development across firms. Such a development would likely be driven by a

common factor that affects the majority of firms to a similar extent. Widespread technological change not limited to specific industries or firm types, as discussed in Karabarbounis and Neiman (2014), would fit such a pattern.

Second, the aggregate trend is predominantly shaped by changes within large established firms. The distribution of value added across firms and labor shares within the majority of firms remain constant, but the labor shares of larger firms – those exerting a disproportionate influence on aggregate measures – decline. Such a pattern would closely align with the "big player scenario" described by Kehrig and Vincent (2021) and likely reflect an evolving distributional conflict between labor and capital with firm size as a crucial determinant.

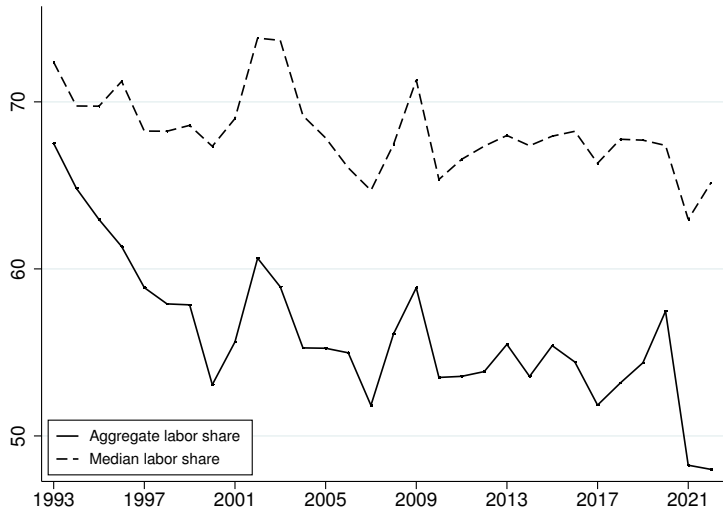
The third possibility reflects the opposite case. Here, firms' individual labor shares remain constant, but those with relatively low labor shares gradually account for an increasing proportion of value added, amplifying their impact on the aggregate labor share. If this dynamic is primarily driven by a small subset of exceptionally fast-growing firms, it corresponds to the "superstar" phenomenon outlined by Autor et al. (2020). While such a scenario has severe distributional implications, it is not the result of a changing outcome of distributional conflicts *within* individual firms but rather a consequence of changes in product markets.

Finally, there is the possibility of a scenario in which certain firms experience significant growth in size, capturing a larger share of aggregate value added while simultaneously reducing their labor share. This implies that labor compensation in these high-growth firms, at least temporarily, increases at a disproportionately low rate. This pattern aligns with the "rising star scenario" proposed by Kehrig and Vincent (2021). Such a scenario likely emerges in dynamic product markets, where innovative firms introduce products that generate exceptionally high demand, resulting in strong pricing power. In turn, incomplete adjustments of labor compensation to productivity lead to a decreasing labor share.

Although all these scenarios would produce a similar overall outcome, the implications would differ significantly depending on the underlying dynamics driving the decline in the aggregate labor share. To identify the underlying pattern among German firms, Figure

4.4 first compares the aggregate development to the evolution of the median labor share. With a decrease of 7 percentage points from 72 percent of GVA in 1993 to 65 percent in 2022, the median experienced a clear downward trend, albeit less pronounced then the aggregate development. The two trends indicate that the development is not solely driven by a particularly small group of individual companies. Although the decline in the labor share was more pronounced in large firms, it still appears to be a more widespread phenomenon among German companies. At the same time, not all firms are equally affected. Instead, the trends suggest that the development in Germany is driven by a somewhat broader subgroup of companies, encompassing but not limited to large firms. This observation seems to argue against explanations rooted in both the "superstar" and "rising star" dynamics in the German context.

Figure 4.4: Aggregate and median labor shares, publicly listed firms



Aggregate labor share as percentage of aggregate GVA. Median of firms' labor shares as percentage of firms' GVA. *Data:* Worldscope; author's calculations.

To investigate the nature of this development more closely, the methodology from Kehrig and Vincent (2021) is applied in the following analysis. Using this approach, counterfactual labor shares are computed to assess the relative importance of changes in market shares versus shifts in individual firms' labor shares. The analysis focuses on the period between 1993 and 2019. This restriction excludes the effects of temporary disruptions related to the Covid-19 shock in certain industries. As the initial market and labor shares

of entering firms are not well-defined, a balanced panel is used to ensure consistency. Despite the more limited scope, the aggregate labor share trend in the balanced panel closely mirrors that of the full sample, indicating that the evolution is not driven by firm entry and exit.[8]

The analysis begins by constructing the counterfactual "constant labor share scenario" that maintains individual firms' labor shares at their initial values while allowing their market shares to follow their actual historical path. The closer the counterfactual labor share – calculated under the assumption of constant firm-level labor shares – aligns with the actual labor share, the stronger the evidence that the aggregate labor share is driven by firms with low labor shares that significantly expanded during the sample period – reminiscent of the superstar phenomenon described in Autor et al. (2020). The counterfactual aggregate labor share, λ_t^{CLS}, is computed as:

$$\lambda_t^{CLS} = \sum_i \lambda_{i,1993}\omega_{i,t} \tag{4.12}$$

For the "constant market share scenario", individual firms' market shares are held constant, while their labor shares are allowed to vary as observed in the data. The closer the counterfactual labor share – calculated under the assumption of firms' constant shares in total value added – tracks the actual labor share, the more it can be seen as evidence for incumbent firms lowering their individual labor share over time as driver of the aggregate development. The counterfactual aggregate labor share, assuming constant firm-level market shares, λ_t^{CMS}, is calculated as:

$$\lambda_t^{CMS} = \sum_i \lambda_{i,t}\omega_{i,1993} \tag{4.13}$$

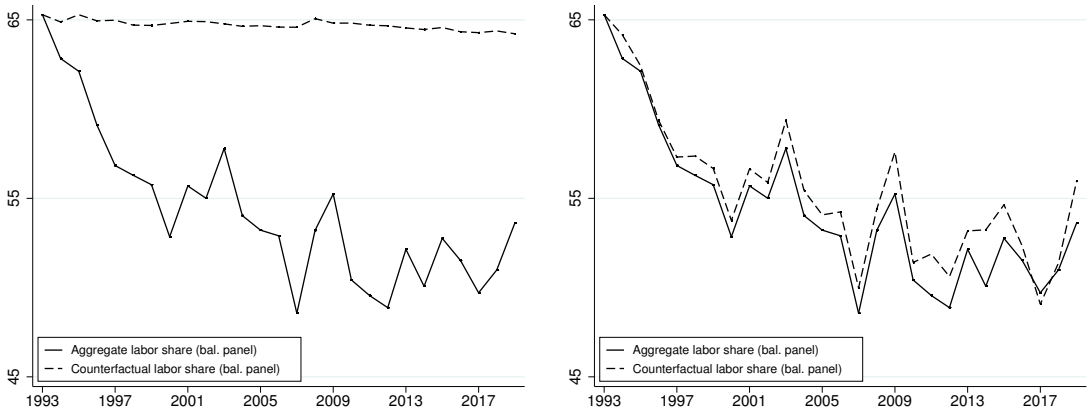
Both scenarios are illustrated in Figure 4.5. The aggregate labor share in the balanced sample declined by nearly 12 percentage points between 1993 and 2019. When examining the counterfactual where labor shares remain fixed at initial levels, the analysis reveals no substantial decline at all. In other words, had the individual labor shares of firms remained unchanged, the aggregate labor share would have been stable throughout the entire period. This finding suggests that shifts in market share distribution cannot account for the

[8]For a comparison between balanced and full panels see Figure A.1 in Appendix A

observed decline in the aggregate labor share, challenging explanations based purely on market share dynamics, thereby rejecting the "superstar" hypothesis.

Figure 4.5: Evolution of the aggregate labor share under different scenarios

(a) Constant labor share scenario (b) Constant market share scenario



Actual aggregate labor share against counterfactual labor shares in the constant labor share scenario (left panel) and the constant market share scenario (right panel). *Data:* Worldscope; author's calculations.

In contrast, the counterfactual under the constant market share scenario yields an aggregate labor share that closely follows the one observed in the actual data. The remarkable alignment between actual developments and the constant market share counterfactual indicates that changes in firm-level labor shares, rather than reallocation of market shares, were the primary driver of the aggregate trend suggesting that the fundamental shifts occurred within incumbent firms. The striking alignment between both trends trend provides compelling evidence to reject the "rising star" hypothesis as well.

Given the structure of the corporate sector in Germany, these results come as no surprise. While the superstar phenomenon is especially reminiscent of the rise of US tech giants like Apple, Amazon, Google, and Facebook, the rising star pattern similarly implies a dynamically evolving corporate landscape. As documented in Section 4.1, the German corporate sector does hardly fit this description. This is perhaps best illustrated by a striking example: Of the ten largest firms by GVA in 2019, eight were already part of the sample in 1993. These eight firms – Volkswagen, Mercedes, Siemens, BMW, Bayer, SAP, Fresenius, and BASF – accounted for 40 percent of GVA in the sample in 1993 and nearly

50 percent in 2019.

However, since the decline in the labor share is not exclusively driven by these large firms, as implied by the falling median labor share, the question arises: What characterizes the group of firms responsible for this decline? Before this question is examined in Chapter 5, we turn to the other components of GVA and their evolution following the decline of the labor share.

4.4 The Use of Profits and the Balance Sheet Composition

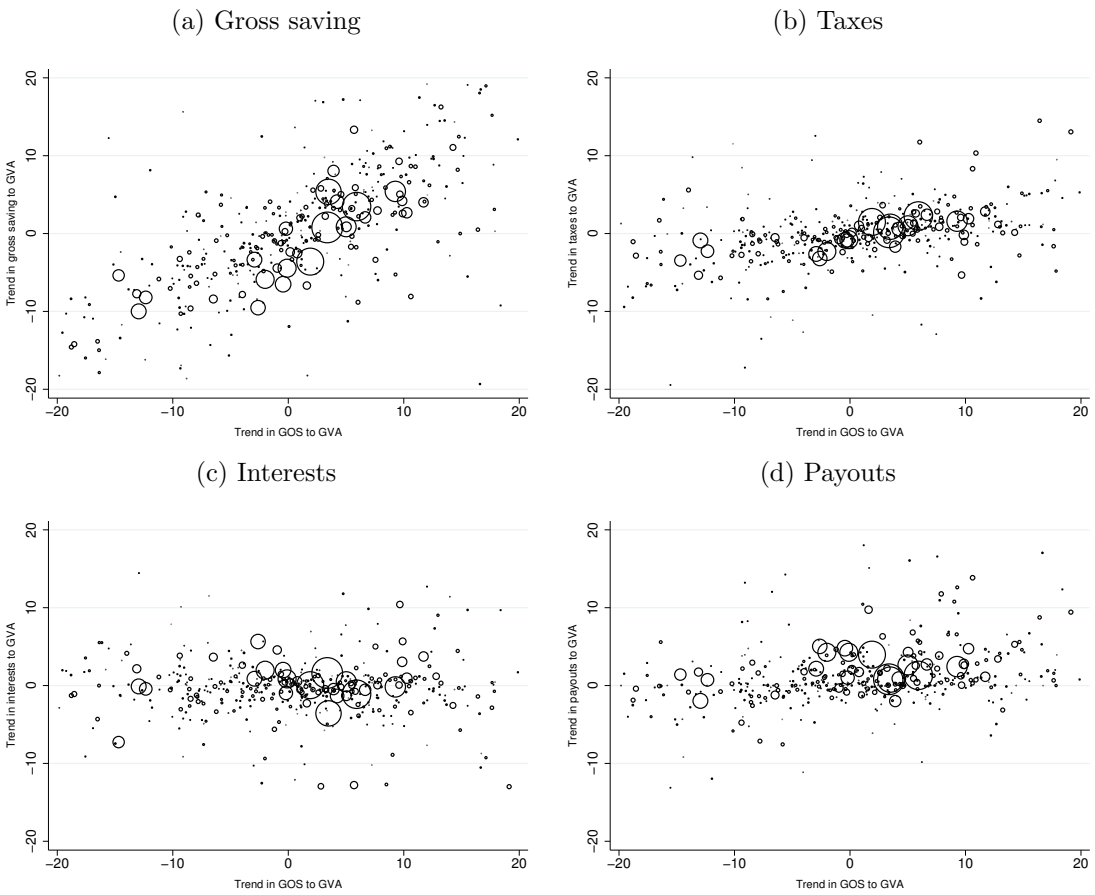
Declining labor shares necessarily correspond to comparable increases in gross operating surplus (GOS) reflecting firms' accounting profits. The development, therefore, necessitates an examination of how firms allocate these additional profits. By accounting identities, the increase must either manifest as higher tax payments, net interest payments, payouts to shareholders, or a larger share of gross saving.

As illustrated in Figure 4.2, the rise in the profit share at the aggregate level is primarily driven by an increase in gross saving and, to a lesser extent, by higher payouts to shareholders. The subsequent analysis explores whether this pattern is consistent at the firm level – specifically, whether the aggregate trend, particularly the growth in corporate saving, can be attributed to firms with declining labor shares retaining the additional profits.

Examining this relationship, the time trends in the shares of different components for individual firms are compared, building on the methodological framework established in Chen et al. (2017). Figure 4.6 shows the percentage point trend over 10 years in firms' GOS-to-GVA ratio plotted against the trends in the constituent components relative to GVA, with firms' average GVA represented through the size of each circle.[9] The only component whose trend shows a strong positive correlation with the trend in gross operating surplus is gross saving. This pattern suggests that firms experiencing declining labor shares over the sample period systematically directed additional profits toward saving.

[9]To obtain meaningful time trends, the analysis is restricted to firms that are included in the sample for at least 10 years. For all ratios, a 1 percent winsorizing is applied.

Figure 4.6: Use of gross operating surplus



Firm-level time trends (in percentage points per 10 years) in the ratio of GOS to GVA plotted against trends in the components that constitute GOS. The size of the hollow circles corresponds to a firm's average GVA over the sample period. *Data:* Worldscope; author's calculations.

The corresponding regressions show highly significant association between the trend in GOS and the trend in gross saving. A trend increase of one percentage point in the ratio of GOS to GVA corresponds to a 0.822 point increase in gross saving relative to GVA when weighting with average GVA and a 0.966 point increase without weighting.[10] This corresponds to an almost one-to-one translation of profits into saving meaning that the rise in corporate saving is a direct consequence of the declining labor share, while other components of GVA remain stable. Accordingly, the same firms responsible for the decrease in the aggregate labor share are also driving the increase in corporate saving.

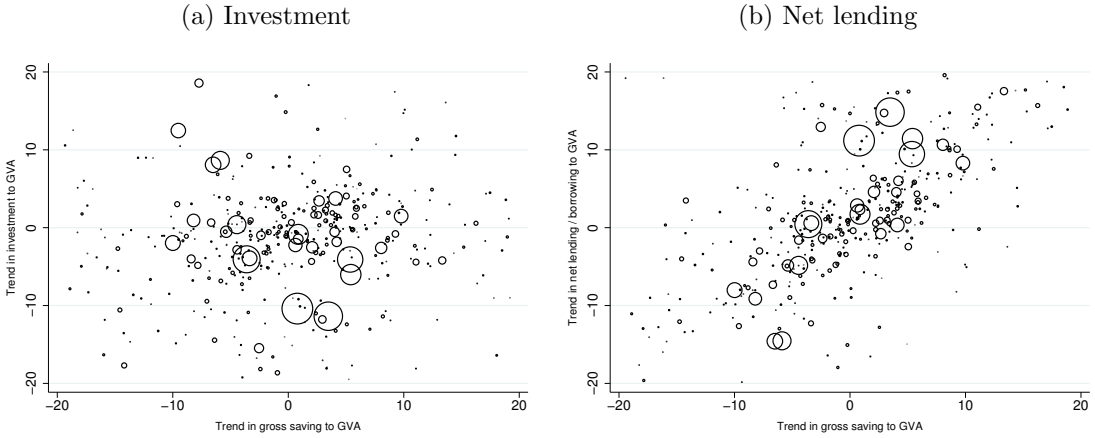
In a next step, the utilization of gross saving is examined. As previously outlined, savings

[10]Results of the regression analyses are summarized in Table A.3 in Appendix A.

can either finance investment expenditures or contribute to net lending. The same analysis as depicted in Figure 4.6 is applied to investigate the relationship between trends in gross saving, investment, and net lending. Figure 4.7 reveals a robust positive relationship with net lending positions, while investment shows no systematic correlation with saving trends. The corresponding regressions indicate significant positive effects of saving trends on net lending trends (1.231 with weighting and 1.404 without weighting). In contrast, significant negative effects are identified for the relationship between saving trends and investment trends (-0.108 with weighting and -0.235 without weighting).[11]

The relationships clearly demonstrate that the rise in saving is not channeled into investment but instead into net lending. Furthermore, the additional resources were not only withheld from investment but the very firms that increased their saving *reduced* investment relative to GVA. This underscores that the rise in saving in Germany cannot be associated with additional investment needs. Moreover, these findings provide an important insight: the financial surplus of German corporations is primarily a consequence of the declining labor share and is not driven by changes in firms' propensity to distribute or retain profits.

Figure 4.7: Use of gross saving



Firm-level time trends (in percentage points per 10 years) in the ratio of gross saving to GVA plotted against trends in the ratios of investment and net lending / borrowing to GVA. The size of the hollow circles corresponds to a firm's average GVA over the sample period. *Data:* Worldscope; author's calculations.

Net lending should theoretically correspond to financial asset accumulation (or reduction

[11] Results of the regression analyses are summarized in Table A.4 in Appendix A.

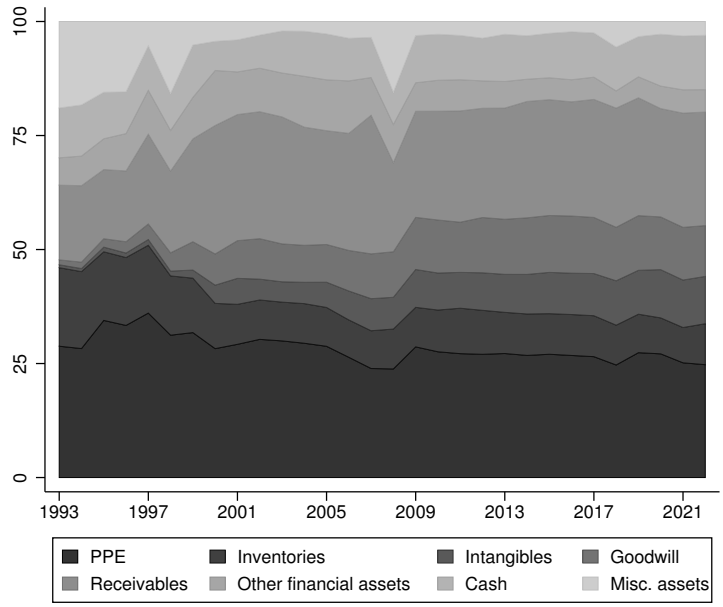
in liabilities). However, as discussed in Chapter 3.2, the allocation of net lending remains unclear at the sector level. The detailed financial information at the firm-level should, however, not suffer from the issues described with regard to national accounts, enabling a detailed examination of how the flow of funds affects the balance sheet composition and the identification of the specific asset classes that absorb firms' financial surplus. To approach this question, the composition of the aggregate balance sheet is examined first. Figure 4.8 shows aggregated assets of sample firms, divided into the different groups defined in Section 4.1.

The data reveals significant structural shifts in asset composition between 1993 and 2022. Physical capital and inventories experienced substantial declines, while intangible assets gained prominence. Specifically, property, plant & equipment decreased from 29 percent of total assets in the early 1990s to less than 25 percent in 2022. Inventories experienced an even stronger decline. Between 1993 and 2022 their share in total assets dropped by more than 8 percentage points and accounted for just 9 percent in 2022. Conversely, the share of intangible assets increased substantially, from less than 1 percent to approximately 10 percent of total assets during this period.

These transformations align with broader patterns documented in national accounts (Section 3.2) and recent research on German investment trends (e.g., Giovanazzi et al., 2024). The trends reflect two fundamental shifts in corporate operations: the growing strategic importance of intangible assets in production processes and the widespread adoption of just-in-time production. Notably, these changes cannot be attributed to sectoral composition effects, as the industrial distribution within the sample remains remarkably stable (Figure 4.1) implying a transformation even within traditional sectors, particularly manufacturing, toward greater reliance on intangible assets.

The next asset class comprises derivative goodwill from acquisitions. Strikingly, goodwill expanded from 1 percent to over 11 percent of total assets between 1993 and 2022. This increase surpasses the growth of other intangible assets, making goodwill the dominant component of intangible capital on corporate balance sheets. As established in previous chapters, goodwill represents an accounting residual without clear specification of its underlying assets. Thus, the shift toward intangibles among German public firms, at least in aggregate, is predominantly driven by by these less precisely defined assets rather than

Figure 4.8: Aggregate balance sheet composition, assets, publicly listed firms



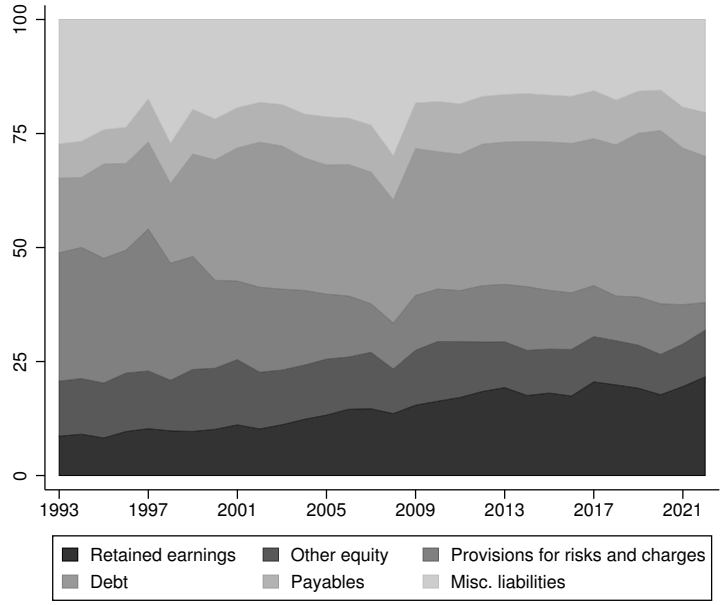
Aggregate asset classes as percentage of total assets. *Data:* Worldscope; author's calculations.

those conventionally associated with the rise of the intangible economy, such as software or intellectual property.

Turning to financial assets, the composition reveals more stable patterns. Receivables, after an expansion during the 1990s, have maintained a consistent share of approximately 25 percent of total assets since the early 2000s. Cash and cash equivalents have similarly remained stable at around 10 percent, while other financial assets show a modest decline. Including miscellaneous assets, the proportion of balance sheet items not classified as tangible or intangible capital has exhibited remarkable stability throughout the observation period.

This stability presents an apparent paradox: persistent financial surpluses should theoretically manifest in financial asset accumulation. One possible explanation may be that the financial surplus is a result of firms increasingly using funds to repay outstanding debt instead of acquiring financial assets. However, the evolution of aggregate liabilities seems to contradict such an explanation. As observable in the breakdown of categories of liabilities

Figure 4.9: Aggregate balance sheet composition, liabilities, publicly listed firms



Aggregate categories of liabilities and shareholders' equity as percentage of total assets. *Data:* Worldscope; author's calculations.

in Figure 4.9, total debt relative to assets doubled from 16 to 32 percent between 1993 and 2022.

The substantial increase in goodwill may offer a resolution to this apparent contradiction. While additions to goodwill are classified as investment in firm accounting, the respective flows are are not included in investment in the context of the present analyses to maintain consistency with national accounts. Importantly, net lending is not a direct measure of the net acquisition of financial assets but rather a residual, encompassing all activities not categorized as non-financial asset acquisition. As a result, the observed increase in net lending may be at least partially linked to M&A transactions.

To systematically examine net lending allocation patterns, analyses are conducted at the level of individual firms, similar to those on the use of profits and savings. Time trends in changes to cash holdings, receivables, and other financial assets, relative to GVA, are regressed on the trend in net lending to GVA. The analysis incorporates debt repayment trends, calculated as the negative change in total debt relative to GVA.Given the poten-

tial relationship between net lending and accumulation of goodwill, trends in additions to goodwill are additionally included.[12] Regression results are reported in Table 4.2.

The first row presents estimated coefficients and standard errors for the full sample between 1993 and 2022. No consistent pattern is observed in the results. While a significant relationship is identified between net lending and debt repayment, the magnitude of the association is small, as is the case for the other variables. Consequently, no dominant allocation target for net lending is identified across the entire observation period. Interestingly, at the level of individual firm trends, no evidence is found for a relationship between net lending and goodwill.

Table 4.2: Use of net lending

	Goodwill		Receivables		Fin. assets		Cash		Debt	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Full sample	-0.010	0.002	0.050***	0.003	0.011	0.016**	0.017	0.063***	0.094***	0.060***
	(0.014)	(0.007)	(0.017)	(0.016)	(0.012)	(0.006)	(0.019)	(0.023)	(0.026)	(0.020)
1993 – 2007	0.055***	0.022*	0.097***	0.005	0.062***	-0.026***	0.132***	0.134***	-0.031	-0.028
	(0.019)	(0.012)	(0.026)	(0.029)	(0.016)	(0.009)	(0.029)	(0.023)	(0.039)	(0.032)
2008 – 2022	0.042***	0.010	0.019	-0.045*	0.027***	0.039***	0.099***	0.280***	0.175***	0.109***
	(0.008)	(0.010)	(0.017)	(0.025)	(0.009)	(0.012)	(0.024)	(0.030)	(0.027)	(0.031)
Industry FE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
GVA weighted	yes	no	yes	no	yes	no	yes	no	yes	no

Estimated coefficients and their standard errors from firm-level regressions of the time trend (in percentage points per 10 years) in the ratio of the change in financial assets and goodwill to GVA on the time trend in net lending to GVA. *, **, and *** denote significance at 10%, 5%, and 1% levels, respectively.

Despite the consistent trend in corporate saving, the use of surpluses has evolved over time. For instance, it appears possible that firms' strategic priorities shifted in response to the financial crisis. Separate regressions are estimated for the periods before and after 2008, with the results shown in the second and third rows of Table 4.2. Before the financial crisis, the estimates reveal a significant relationship between net lending and trends in goodwill, although the effect size remains small. A strong relationship is also observed between net lending and receivables, particularly among larger firms, as indicated by regressions weighted with firms' GVA. In contrast, the post-crisis period shows a distinct shift: the propensity to reduce debt in response to financial surpluses increases signifi-

[12] As in the regression analyses of profits and savings, time trends are estimated as changes in the respective variables expressed as percentage points of GVA over a 10-year period. To ensure meaningful results, the sample is restricted to firms with at least 10 years of continuous data.

cantly, alongside a stronger emphasis on cash holdings. These findings seem consistent with the collapse in sales and the subsequent increase in uncertainty potentially affecting liquidity preferences.

Despite these observations, no dominant pattern of surplus utilization emerges from the analysis of firm-specific trends. Firms appear to allocate their surpluses in diverse ways, with no consistent strategy identified – neither across firms nor over time.

How can the discrepancy between relationships observed at the firm level and those at the aggregate level be explained? One possible explanation may be the nature of goodwill, the only asset to show significant growth at the aggregate level. Unlike other asset classes, goodwill is unlikely to be accumulated steadily over time. Instead, the evolution of aggregate goodwill is strongly influenced by large-scale one-off transactions. Examples of such transactions include, for example, Linde's acquisition of BOC in 2006 or Bayer's takeover of Monsanto in 2018. These substantial transactions, reflected on the balance sheets to a considerable extent as goodwill, may not be fully captured in estimated firm-level trends.

When the firm-level results are considered as a whole, a general pattern underlying the decline in the labor share and the rise in corporate saving is evident. A significant group of firms has reduced labor shares while increasing gross saving, amid relatively stable shares of other GVA components. Consequently, these firms appear to be key contributors to the rising financial surplus. However, the allocation of this surplus remains unclear, even at the micro level.

It seems, however, possible that the surpluses are used for corporate transactions reflected in a corresponding shift toward goodwill. Notably, goodwill is not a financial asset in the traditional sense, as it does not represent a claim by another entity. This raises fundamental questions about how financial surplus is measured and how spending associated with goodwill should be interpreted. Since these expenditures are not purely financial transactions, a discussion seems warranted on what else they represent and whether, even in a macroeconomic context, they should be understood as a form of investment. These issues will be addressed in detail in Chapter 6.

Regardless of the specific interpretation of goodwill, such an allocation of net lending may align with trends observed at the macro level, as recorded in national accounts. As

discussed in Chapter 3.2, macroeconomic data suggest that financial surpluses are predominantly directed toward equity acquisitions, particularly of foreign companies. Since the national accounts adhere strictly to a domestic principle, acquisitions of foreign companies are reflected as increases in equity holdings, whereas, at the firm level, following a successful takeover, foreign assets are consolidated, and the excess costs of acquisition appear as goodwill. This may suggest that the increase in equity holdings at the macro level and the rise in goodwill in aggregate corporate balance sheets represent the same phenomenon. However, due to significant data limitations, no definitive conclusions can be drawn, and further research is required to substantiate this interpretation.

The earlier sections have shown that the overall development – from the decline of the labor share to the rise of net lending – originates from a key group of firms whose flow of funds has shifted significantly in recent decades. In subsequent chapters, this group will be examined in more detail to uncover the underlying drivers of these developments.

5. The Role of Family Firms

After the previous chapter explored firm-level foundations of macroeconomic developments, this chapter turns to the role of family firms in shaping flow of funds following the idea that the strategic orientation of controlling families may be a key factor specifically in Germany. A systematic empirical analysis of family firms is, however, hampered by two crucial factors: the lack of a general definition of what constitutes a family firm and the challenging data availability. In the following, precise definitions will be derived, and an original dataset will be introduced to identify family firms and analyze their impact on the flow of funds in the corporate sector.

5.1 Identification of Family Firms

It is not surprising that there is no universally accepted definition of family firms, as control and influence depend on a multitude of factors. The primary criterion for assessing control over a company is the formal ownership structure. Consequently, this is also the central focus in this analysis. However, ownership structures are often complex, involving dual-class shares, pyramid structures, cross-holdings, or multiple control chains (Faccio and Lang, 2002; Laeven and Levine, 2007; Aminadav and Papaioannou, 2020). These complex structures are often deliberately used to obscure ultimate ownership (Zucman, 2015), making a clear assessment challenging in many cases. They can also result in shareholders' control rights – their voting rights at the annual general meeting – exceeding their cash flow rights, i.e. the share of profits to which they are entitled. Determining the extend of influence of different owners systematically is, therefore, anything but trivial. Moreover, the influence of shareholders is significantly affected by the legal framework, meaning that ownership stakes should be evaluated differently depending on the country in terms of control over the company.

Additionally, the appointment to management positions plays a significant role in influenc-

ing the company. Whether family members hold positions is therefore another important criterion. However, legal frameworks also play a role here. For instance, German law mandates a system with two separate boards with distinct functions, and the appointment of family members to these positions should be evaluated accordingly.

Furthermore, companies are also influenced by informal networks and connections that are difficult to discern from the outside and challenging to quantify. The complexity can be illustrated using the example of one of Germany's largest companies. The predecessor of today's Volkswagen AG was founded in 1937 by the then German state, specifically to produce an automobile designed by Ferdinand Porsche. The Porsche family was therefore closely associated with the company from the outset, although without holding ownership stakes. This connection persisted, with Ferdinand Porsche's grandson, Ferdinand Piëch, serving as CEO of Volkswagen from 1993 to 2002. In 2008, Volkswagen AG was subsequently acquired by the Porsche/Piëch family, who have since been the controlling shareholders. The extent to which and from when the company should be classified as a family firm, and particularly how such a classification can systematically apply to other companies, indeed poses a challenge.

Despite the challenges, various criteria are proposed in the literature, typically involving family ownership, managerial involvement, or a combination thereof. In a seminal study La Porta et al. (1999) define a firm as family-controlled if a family collectively holds shareholder control rights above a certain threshold. While many subsequent studies have adopted this approach, the specific threshold remains a subject of debate. Some studies use thresholds of 20 percent (La Porta et al., 1999; Sraer and Thesmar, 2007; Aminadav and Papaioannou, 2020), others use 25 percent (Franks et al., 2015; Lins et al., 2013). Still, others use significantly lower thresholds, such as 5 percent (Anderson et al., 2012; Chrisman and Patel, 2012).

Following this approach, a cumulative ownership threshold of 25 percent is used in the following analyses. Under German law, a 25 percent stake grants the shareholder the authority to veto significant decisions, thereby conferring disproportionate influence over the company. These decisions encompass critical matters such as company dissolution, secondary equity offerings, dismissal of supervisory board members, and alterations to the

articles of incorporation.[1] Since the subsequent analyses are concerned with the influence of families over the companies, the focus is placed on control rights, particularly when they diverge from cash-flow rights. To address the issue of complex control chains in this context, it is assumed that a shareholder at each level controls the company with a stake of 25 percent. As an example, if an individual holds between 25 and 100 percent in a non-listed company or holding company, which itself owns x percent of a publicly listed company, that individual is considered to have control over x percent of the publicly listed company. Ownership stakes without voting rights, such as preference shares, are excluded. All shares that can be attributed to family members are then aggregated to calculate the family's cumulative share. For the baseline definition, distinction is not made between founding and non-founding families. Therefore, families that either founded the company or acquired it later are included.

Although board representation is not included in the primary definition, additional subgroups of family firms are distinguished by integrating ownership and governance data. Since Germany's two-tier board structure makes a detailed categorization appropriate, subgroups are defined as follows: first, family firms where, in addition to meeting the ownership criteria, at least one family member holds a seat on the management board; second, family firms where at least one family member is part of the supervisory board; and third, family firms with family members on both the management and supervisory boards. Moreover, family firms identified by the control rights threshold are further divided into three categories: those led by the founder, those managed by another member of the controlling family, and those with an external CEO.

5.2 Ownership and Governance Dataset

The main source of the ownership and governance dataset is *Hoppenstedt Aktienführer*, a historical reference book on German firms, dating back to 1935, whose contents have been transferred to an online database.[2] The database includes information on non-financial

[1] The relevant regulations are governed by the German Stock Corporation Act (§§103,179,182, 222,262 AktG).

[2] The database is available through the University of Mannheim (https://digi.bib.uni-mannheim.de/aktienfuehrer/).

and financial publicly listed firms based in Germany, along with foreign firms cross-listed on German stock exchanges. Alternative sources of information on the shareholder and management structures of German firms have either been discontinued or lack the information necessary to systematically illustrate these structures over longer periods of time.[3] While *Hoppenstedt Aktienführer* is the most suitable data source for our purposes, it brings with it a number of important challenges. Although the original manuals have been digitized and made available online, they are presented in a format that is unsuitable for direct analysis. Moreover, and crucially, the dataset lacks information on the family relations between individual shareholders and managers, which requires substantial additional processing to identify controlling families.

The raw data obtained from *Hoppenstedt Aktienführer* includes all available information on shareholders, members of the management board (*Vorstand*), and the supervisory board (*Aufsichtsrat*) between 1974 and 2017. The information is provided annually for each company, enabling a panel structure for the dataset.[4] The raw data includes 3190 separate entities with unique identifiers. However, *Hoppenstedt Aktienführer* irregularly assigns different identifiers to the same companies when the name or the corporate structure changes.[5] To address this issue, *Worldscope* permanent IDs – from the financial dataset presented in Chapter 4.1 – are used, which are assigned to the entities included in the data from *Hoppenstedt Aktienführer*. After appropriately merging IDs, financial and real estate firms, cross-listed non-German firms, and consolidated subsidiaries of other firms in the sample are removed. The sample period is limited to the years since 1993, as the data quality for the previous years is significantly poorer. After these restrictions, 1038 firms with comprehensive ownership and governance information remain in the dataset.

Regarding ownership, *Hoppenstedt Aktienführer* provides a list of shareholders for each firm/year with two main pieces of information: the name of the shareholder and the per-

[3] For example, the *Wer gehört zu wem* database used in a number of older studies on German firms (e.g., Faccio and Lang, 2002) only extends to 2010, while other popular databases such as *BvD Orbis* provide mostly incomplete or unreliable information in this regard.

[4] For the years 1999 and 2009-2017, *Hoppenstedt* provides two disclosures per year: one for the middle of the year and one for the end of the year. Since information for other years is only available for the end of the year, only end-of-year data is used for all years.

[5] For example, there are two separate entries with unique identifiers for the automobile company that today operates as Mercedes Benz Group AG, namely Daimler AG before 1998 and, after a merger in 1998, DaimlerChrysler AG. After 2007, when the merger is dissolved and the name changes back to Daimler AG, the identifier remains the same.

centage of shares held. For some shareholders, additional information of various kinds is included. However, the raw data presents a variety of difficulties. In various cases, the percentage of shares held is displayed in non-numerical form. Corrections are made manually following a specific code book described in Table B.1 in Appendix B. In some cases, the information on shares held is missing in the appropriate variable but included in another variable containing additional information. In these cases, the correct information is manually transferred to the appropriate variable. Implausible or unusable information is excluded. Besides obviously faulty entries, there are cases where the raw data contains information on the geographic distribution or total number of shareholders instead of information on individual shareholders. Preference shares are excluded from the calculation. Specifically, shareholders which only hold preference shares are excluded and the holdings for those for whom both ordinary and preference shares are reported separately are adjusted accordingly.[6] In the case of limited partnerships with shares (*Kommanditgesellschaft auf Aktien*), the raw data frequently only includes limited liability shareholders. In such cases, the general partner is added as shareholder with his share in the firm's equity adjusting the other shares accordingly.

Additionally, a variable is generated to display the percentage of shares in free float. In various cases, there is a "shareholder" whose "name" indicates that a certain percentage is in free float; in such cases, this information is used to populate the free float variable, and the information on the respective "shareholder" is dropped. In other instances, a "shareholder" whose "name" indicates that all remaining shares are in free float is encountered; in these cases, all reported shares are aggregated to calculate the value for the free float variable. Consequently, the shares displayed in the dataset cover 100 percent of the firms' controlling shares for the vast majority of observations.

Regarding management, *Hoppenstedt Aktienführer* provides a list of all members of the management board (*Vorstand*), responsible for day-to-day operations, and a list of all members of the supervisory board (*Aufsichtsrat*), which oversees and appoints the members of the management board. For all board members, first and last names are provided, while additional information such as exact roles or areas of responsibility is irregularly

[6] Unfortunately, the raw data does not clearly state in some cases what type of shares the reported numbers refer to. However, the number of firms in Germany which issue dual class shares is limited. Therefore, the possible margin of error is likely to be small.

provided.[7]

Next, shareholders are categorized along different dimensions. Specifically, for each shareholder included in the dataset, six additional variables are created: The first variable assigns shareholders to one of nine categories: individual/family, family holding/foundation, institutional investor, widely-held firm in same/related sector, state (domestic), state (foreign), employees, treasury shares, and miscellaneous.[8] As mentioned earlier, *Hoppenstedt Aktienführer* provides additional shareholder information that aids in assigning these types. However, for the majority of cases, classification relies on manually collected information. Sources include, but are not limited to, company websites, financial statements, newspaper articles, financial information providers (e.g., bloomberg.com), internet platforms for historical shares/securities (e.g., hwph.com), and wikipedia.org. The sources of hand-collected information used to populate these variables are documented in Appendix B.

Table 5.1: Variables for shareholder characteristics

Variables	*Coding*
Shareholder type	1 individual/family; 2 family holding/foundation; 3 institutional investor; 4 widely-held firm in same/related sector; 5 miscellaneous: 6 state (domestic); 7 state (foreign); 8 employees; 9 treasury shares.
Family connection	1 if shareholder is member of or can be attributed to family; 0 otherwise
Founder relation	1 if shareholder is firm's founder; 2 if shareholder is founder's relative; 0 otherwise
CEO	1 if shareholder is CEO; 0 otherwise
Management board	1 if shareholder is member of management board; 0 otherwise
Supervisory board	1 if shareholder is member of supervisory board; 0 otherwise

[7]Depending on the firm's legal form, the executive management board may be referred to as *Geschäftsführung* instead of *Vorstand*. *Hoppenstedt Aktienführer* thus provides two separate datasets. The information regarding the members of the firm's management board can be found in either dataset. Since both bodies fulfill the same role within their respective firms, both datasets are merged. For practical reasons, members are solely referred to as members of the management board.

[8]Detailed definitions of these categories are displayed in Table A.5 in Appendix A.

The second variable indicates whether the shareholder is a member of or can be attributed to the dominating family. The term "family" here includes persons who are related by direct descent or marriage, as well as corporations owned by family members. In this context, "dominating" means that in cases where there are two or more families among the shareholders, only members of the family with the largest collective share are considered. The assessment of family affiliation relies on the surnames of shareholders provided by *Hoppenstedt Aktienführer* and on information collected manually from various online sources. If the shareholder is not a natural person, substantial efforts are made to trace the control chain back to the ultimate owner. Specifically, the owner or controlling shareholder of each firm is identified starting with the shareholders listed in *Hoppenstedt Aktienführer*, until a natural person is identified, if applicable. The classification of shareholders is then based on the identity of the ultimate owner. Foundations are classified as part of the family if family members can be identified as ultimate beneficiaries or if the foundation is charitable but de facto controlled by family members. This identification process results in each shareholder being clearly attributed to a controlling family or not.

The third variable indicates the relation to the company's founder. Distinctions are made between three cases: founder, relative of the founder, and no relationship to the founder.[9] For classification, again, a vast number of online sources are consulted.

The fourth variable indicates whether the shareholder is the CEO of the company. The fifth and sixth variables indicate whether the shareholder is a member of the executive board and a member of the supervisory board, respectively. Again, these distinctions apply only to natural persons. These variables are populated by comparing the names of shareholders with those provided in the management data from *Hoppenstedt Aktienführer*. If a family member is part of either board but does not hold shares personally (or holds them only indirectly, thus not appearing in the original shareholder list), they are added as an additional "shareholder" with zero shares held. This ensures that the calculation of shares held by different shareholders remains accurate, while acknowledging familial connections that influence the firm's management.

The variables used to categorize shareholders allow for the identification of all sharehold-

[9]The distinction applies only to natural persons; firms and other entities as shareholders are never classified as founder/relative irrespective of their owner/beneficiary.

Table 5.2: Family Firm Indicators

Variable	*Description*
Family share	Cumulative controlling share held by members of the dominant family
Member in management	1 if at least one family member in management board; 0 otherwise
Member in board	1 if at least one family member in supervisory board; 0 otherwise
Founder CEO	1 if firm's founder is CEO; 0 otherwise
Member CEO	1 if other family member is CEO; 0 otherwise
Family firm	1 if family share $\geq$ 25%; 0 otherwise
Family firm & management board	1 if family share $\geq$ 25% and at least one family member in management board; 0 otherwise
Family firm & supervisory board	1 if family share $\geq$ 25% and at least one family member in supervisory board; 0 otherwise
Family firm & management & supervisory board	1 if family share $\geq$ 25% and members in both boards; 0 otherwise
Family firm & founder CEO	1 if family share $\geq$ 25% and CEO is the founder; 0 otherwise
Family firm & other family CEO	1 if family share $\geq$ 25% and CEO is another family member; 0 otherwise
Family firm & external CEO	1 if family share $\geq$ 25% and CEO is not a family member; 0 otherwise

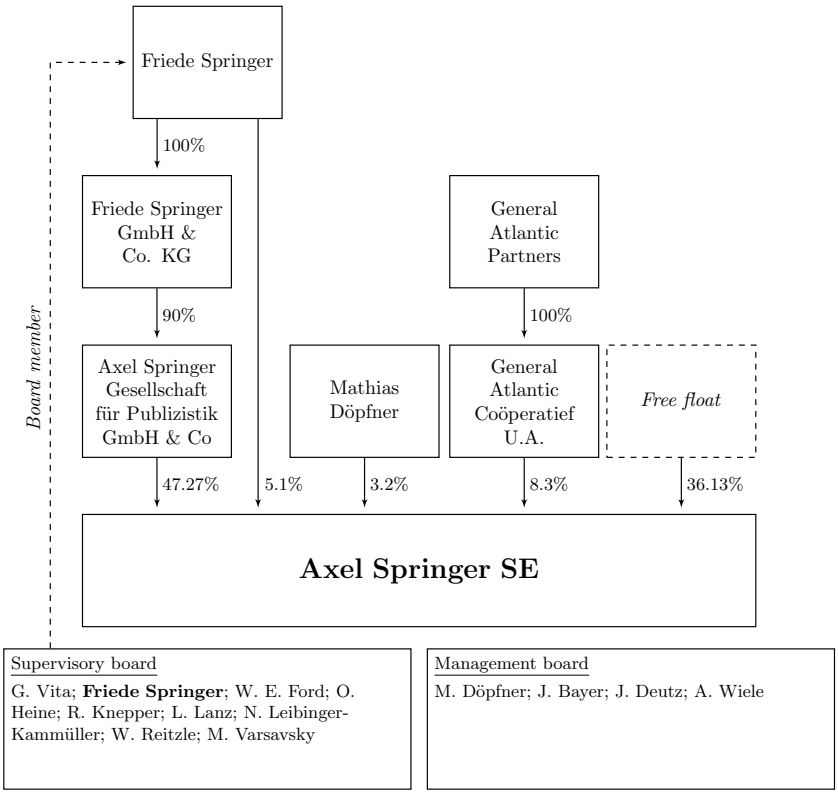
ers associated with a family and the calculation of the cumulative share held by family members. This share, combined with variables indicating the relationship to the founder and management involvement, is used to define a set of indicators which groups firms according to the definitions described in Section 5.1. The indicators and their precise definitions are summarized in Table 5.2.

To illustrate the process through which the shareholders, and ultimately firms, are categorized, consider three examples. The first example is Axel Springer SE, a large internationally operating mass and online media company, in 2017. *Hoppenstedt Aktienführer* provides information on four shareholders. The first shareholder is called Axel Springer Gesellschaft für Publizistik GmbH & Co. with a stake of 47.27 percent. Additionally, Hoppenstedt provides the information that this shareholder is 90 percent owned by Friede Springer GmbH & Co. KG. Information accessible online reveals that this again a holding company owned by Friede Springer, the widow of company founder Axel Springer. Ac-

cordingly, this shareholder is categorized as family controlled holding company. Since it does not denote a natural person, this shareholder is per se not categorized as founder or member of the management or supervisory board.

The third shareholder included in *Hoppenstedt Aktienführer* is Friede Springer herself, owning 5.1 percent of shares directly. Note that this is the same as the ultimate owner of shareholder 1. Therefore, both of these shareholders are assigned to the "family". The third shareholder is Mathias Döpfner with a 3.2% stake. He is the CEO of Axel Springer SE but not part of the Springer family. The fourth shareholder is called General Atlantic Coöperatief U.A. According to *Hoppenstedt Aktienführer*, it is a Netherlands based subsidiary of General Atlantic Partners which can easily identified as an American equity firm owning assets on behalf of its clients. Therefore, this shareholder is categorized as institutional investor/asset manager not associated with the Springer family.

Figure 5.1: Ownership and governance structure, Axel Springer SE, 2017



Comparing the list of board members with the names of the shareholders reveals that Friede Springer is part of the supervisory board. As widow of Axel Springer she is also a relative of the company's founder. No family members are involved in the management board.

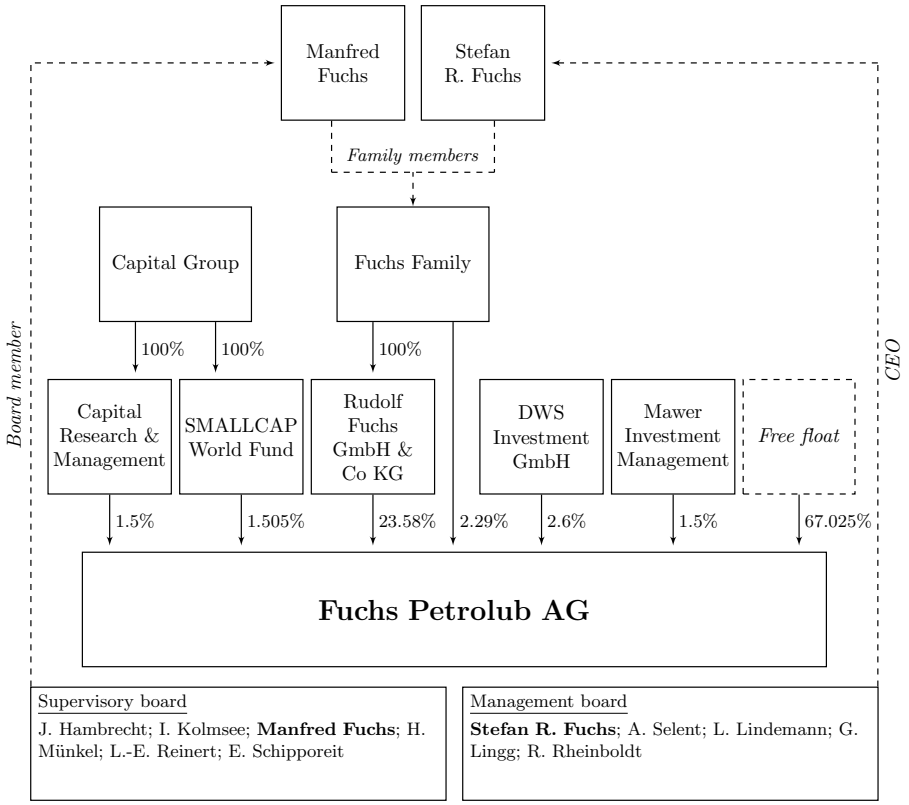
Figure 5.1 depicts the ownership and governance structure derived from this information. The company is controlled by Friede Springer, through a chain of holding companies, ultimately owning 52.37 percent of shares. Other relevant shares are held only by the CEO, who is not related to the controlling shareholder, and an institutional investor, with the remaining shares in free float. In addition to her ownership stake, Friede Springer is represented in the company's supervisory board.

As a second example, consider Fuchs Petrolub AG, a manufacturer of industrial lubricants and related products, in 2012.[10] With a stake of 23.58 percent, the largest shareholder of Fuchs Petrolub AG included in *Hoppenstedt Aktienführer* is Rudolf Fuchs GmbH & Co KG. Online research reveals it to be a holding company, acting as exclusive wealth manager of the Fuchs family. Accordingly, the shareholder is categorized as associated with the controlling family. The second entry is a direct 2.29 percent stake of the Fuchs family. The third is called Capital Research & Management and holds 1.5 percent of shares. *Hoppenstedt Aktienführer* also records it to be a subsidiary of Capital Group, an American financial services and investment management company. Similarly, the fourth shareholder, and SMALLCAP World Fund (1.505 percent), can be easily identified as an investment fund operated by Capital Group. The fifth and sixth shareholders are DWS Investment GmbH and Mawer Investment Management, investment managers from Germany and Canada, respectively. Accordingly, all four of these shareholders are categorized as institutional investors/asset managers not affiliated with the Fuchs family.

Comparing the list of members of the management and supervisory board with the names of the shareholders yields no direct match since all shareholders are corporate entities or groups of people. However, two members of the Fuchs family are included: Stefan Fuchs as CEO in the list of management board members (as CEO) and Manfred Fuchs in the list of supervisory board members. To reflect the link between the shareholders and the board representation of the ultimate owners in the dataset, the two individuals are added as

[10] In 2023, the company was renamed to *Fuchs SE*.

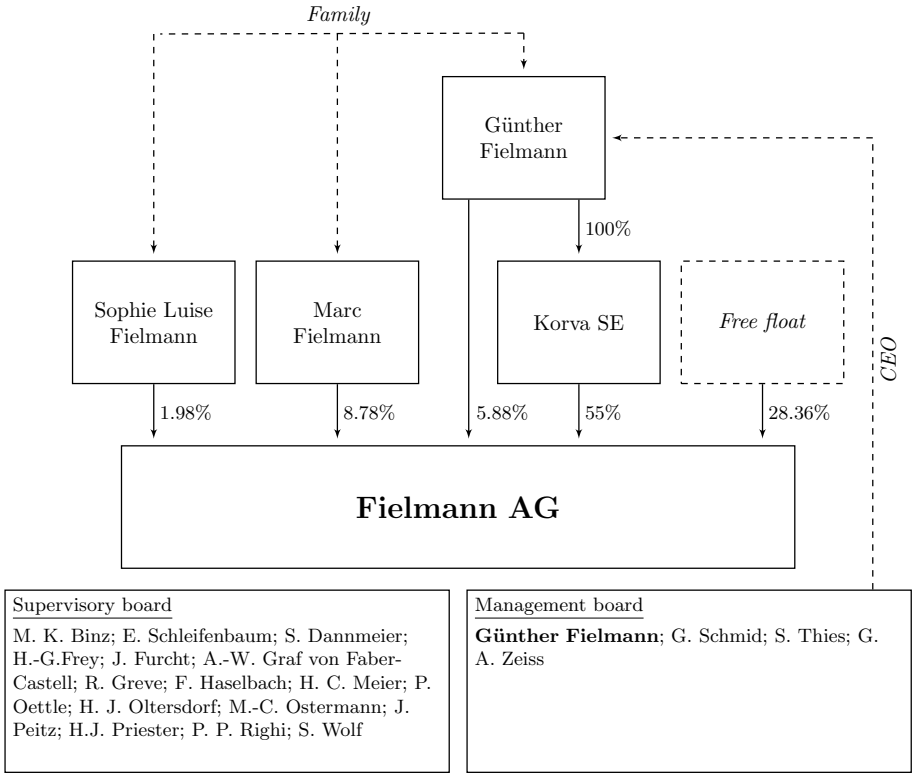
Figure 5.2: Ownership and governance structure, Fuchs Petrolub AG, 2012



shareholders. However, a stake in Fuchs Petrolub of 0 percent is assigned since all shares which are (indirectly) owned are already captured by Rudolf Fuchs GmbH & Co KG and the Fuchs Family as a whole. Online research reveals that the founder of Fuchs Petrolub was Rudolf Fuchs, the father of Manfred and grandfather of Stefan Fuchs. Accordingly, Manfred and Stefan Fuchs, as well as the family as a whole are categorized as relatives of the founder.

Figure 5.2 depicts the derived ownership and governance structure of Fuchs Petrolub AG in 2012. The company is controlled by the Fuchs family, primarily through a holding company, ultimately owning 25.87% of shares. Other relevant shares are small in comparison and owned by institutional investors, with the remaining shares in free float. In addition to their ownership stake, two members of the Fuchs family are represented in the company's boards.

Figure 5.3: Ownership and governance structure, Fielmann AG, 2014



As a third example, consider Fielmann AG, the leading eyewear retailer in Germany, in 2014. *Hoppenstedt Aktienführer* records four individual shareholders. With a stake of 55 percent, a holding company called Korva SE is by far the largest shareholder. The company is exclusively owned by Günther Fielmann. The second shareholder is Günther Fielmann himself, owning an additional 5.88 percent. The remaining recorded shareholders are Marc Fielmannn and Sophie Luise Fielmann, owning 8.78 and 1.98 percent, respectively. The remaining shares are in free float.

As can be learned through online research, Günther Fielmann is the founder of the company. Marc and Sophie Luise Fielmann are his children. Comparing shareholders names to the list of members of the management board identifies Günther Fielmann as CEO, making Fielmann AG – in addition to being family-controlled – a founder-led firm in 2014.[11]

[11] In 2019, Marc Fielmann took over the CEO position from his father.

Table 5.3: Family firm indicators, Axel Springer SE, Fuchs Petrolub AG, and Fielmann AG

Indicator	Axel Springer 2017	Fuchs Petrolub 2012	Fielmann 2014
Family share	52.37%	25.87%	71.64%
Family firm (25% ownership)	Yes	Yes	Yes
Family firm & management board	No	Yes	Yes
Family firm & supervisory board	Yes	Yes	No
Family firm & both boards	No	Yes	No
Family firm & founder CEO	No	No	Yes
Family firm & other family CEO	No	Yes	No
Family firm & external CEO	Yes	No	No

Table 5.3 shows how the derived ownership and governance structures of Axel Springer SE, Fuchs Petrolub AG, and Fielmann AG translate into the indicators described in Table 5.2. Since the shares in Axel Springer which can be attributed to the Springer family exceed 25 percent, it is a family firm according to the baseline ownership definition. More specifically, it is a family firm where the controlling family is also represented on the supervisory board. Moreover, Axel Springer is an externally managed family firm. The other definitions do not apply to Axel Springer in 2017. Similarly, the family shares in Fuchs Petrolub exceed 25 percent making it a family firm according to the ownership definition. Additionally, it can be categorized as a family firm with family representation in both boards and a CEO who is a family member although not the founder. Fielmann is a founder led family firm with family representation on the management board.

After these procedures have been applied to the entire dataset, it offers a comprehensive picture of the ownership and governance structures. Unfortunately, ownership data is only available up to 2017. However, ownership structures, especially family ownership, tends to remain remarkably stable over time. Therefore, the family share is extrapolated from 2017 to 2018 and 2019 to extend the period of analysis as much as possible.[12]

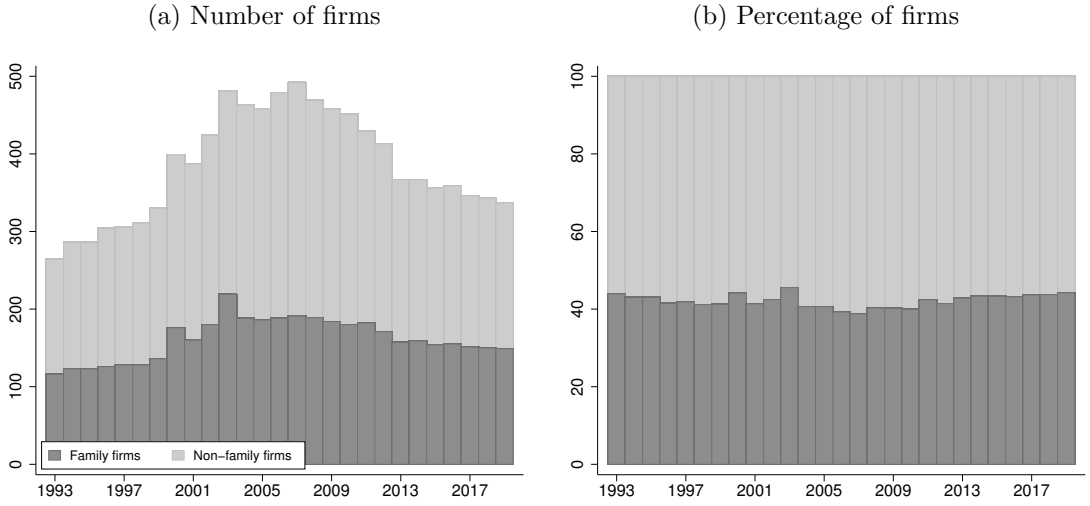
[12]Similarly, for a limited number of observations where ownership information is missing, the family share is imputed based on the value from the previous year or, if that is not available, from the subsequent year. This imputation is applied only when shareholder information is absent for the respective year but available for adjacent years, and when data on board membership is included in the raw data, affecting only a small portion of the overall sample, specifically 273 observations.

The dataset constructed in this way is then merged with the financial data described in Section 4.1, resulting in a comprehensive dataset that includes both ownership and governance information, as well as detailed financial data for 929 firms. The sample encompasses the majority of economic activity within the full firm sample – in 2019, aggregated GVA represents over 96 percent of the total GVA in the firm sample in that year – enabling a thorough analysis of the impact of family ownership and control on the developments discussed in the previous chapters.

5.3 The Prevalence and Importance of Family Firms

Before turning to the flow of funds in family firms, this section outlines the composition of the sample with regard to the characteristics of the companies in terms of ownership and governance structures.

Figure 5.4: Prevalence of family firms



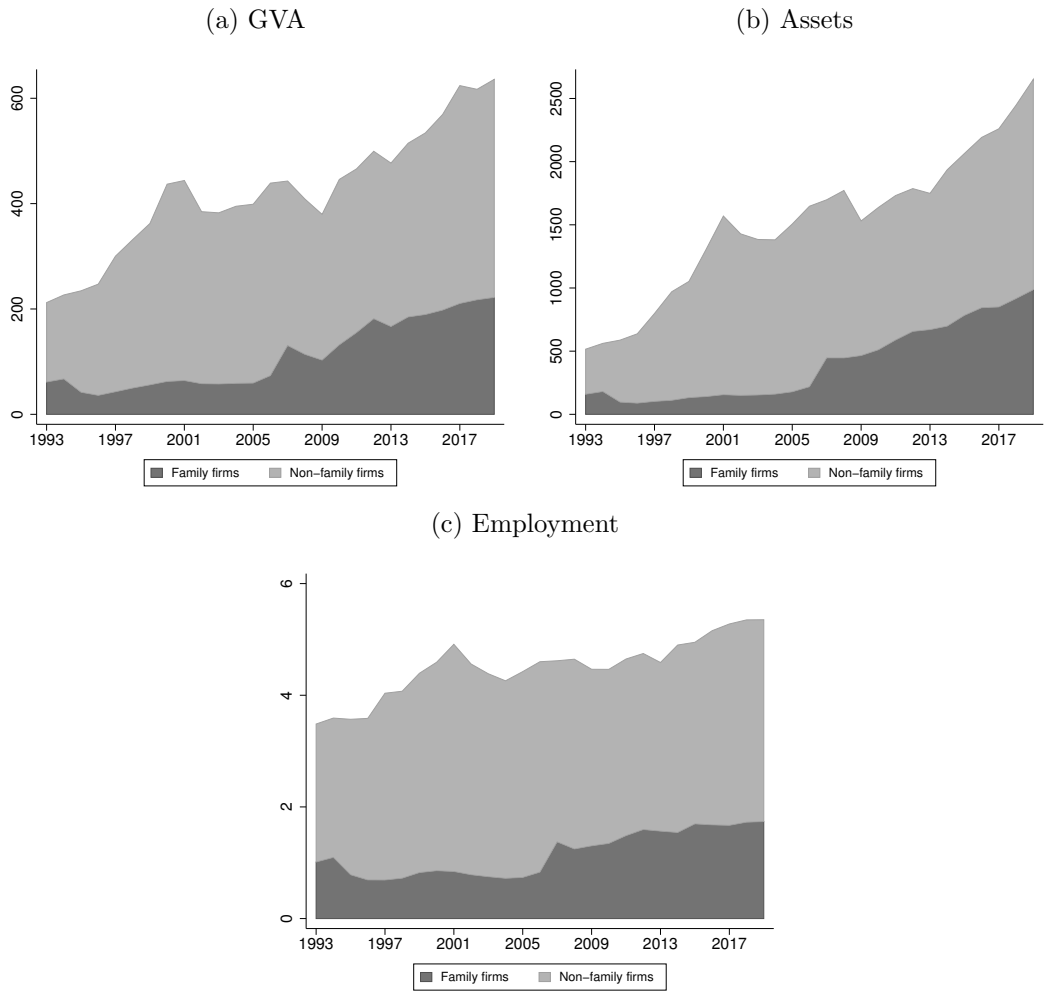
Total number (left panel) and percentage of total firms (right panel) of family and non-family firms. *Data:* Family Ownership and Governance database; author's calculations.

Figure 5.4 illustrates the prevalence of family firms among publicly listed companies, based on the baseline ownership definition. While the absolute number of firms fluctuated considerably – starting at 264 in 1993, peaking at 492 in 2007, and declining to 338 by 2019

– the proportion of family firms has remained stable. Annually, approximately 40 percent of firms had a family as the controlling shareholder, holding at least 25 percent of shares.

This consistently high proportion is remarkable, as family businesses and publicly listed firms are often seen as opposite models in public discourse. Since non-listed firms are also predominantly owned by individuals or families (Gottschalk et al., 2019), the prevalence among publicly listed firms underscores the critical role of family firms in the German economic system.

Figure 5.5: Aggregate gross value added, assets, and employment



Aggregate gross value added (GVA) in billions of Euros (left panel) and aggregate number of employees (right panel) for family and non-family firms. *Data:* Family Ownership and Governance database; Worldscope; author's calculations.

The share is also striking in international comparison. Aminadav and Papaioannou (2020), for example, identified only a few industrialized countries – mainly smaller economies like Greece or Portugal – with comparable proportions of family firms among publicly listed companies despite applying a lower threshold for corporate control. Among major industrialized nations, Germany is an exception in this regard.

Looking at the contributions of family firms to overall economic activity, Figure 5.5 shows GVA, assets, and employment in both types of firms. In 1993, publicly listed firms in the sample generated 212 billion Euros in GVA, with family firms contributing 60 billion (29 percent). By 2019, total GVA had nearly tripled to 636 billion Euros, with family firms contributing 222 billion (34 percent). Similarly, family firms' share of assets grew from 31 percent in 1993 (159 billion out of 516 billion Euros) to 37 percent in 2019 (985 billion out of 2,560 billion Euros). Employment in family firms rose from one million (29 percent of the total workforce) in 1993 to 1.7 million (over 32 percent) by 2019. Although family firms represent a smaller share of aggregate GVA and employment than their numerical prevalence suggests, their contributions are substantial. These patterns indicate that their distinct behaviors could significantly influence broader economic trends.

To better understand the characteristics of family firms in the sample, Figure 5.6 illustrates the distribution across industries. Figure 5.6a depicts the shares of different industries in aggregate GVA of family firms while Figure 5.6b shows the same for non-family firms.

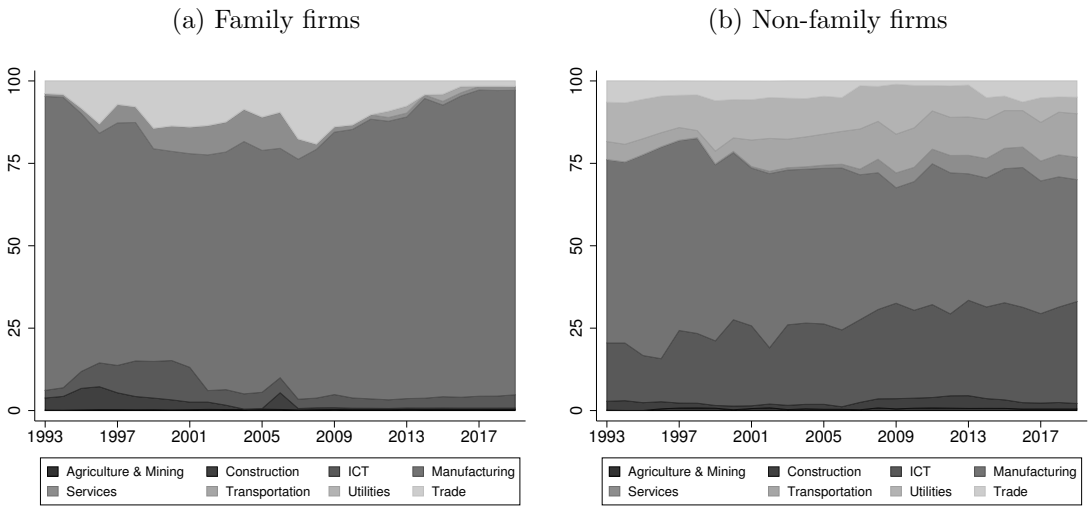
Agriculture and mining play a negligible role, with few companies and contributions below one percent of total GVA for both family and non-family firms throughout the period. The construction sector is somewhat more relevant, but its share in total GVA is still relatively small and has declined over time in both groups.

Information and communication technologies (ICT), however, reveals stark differences. Among non-family firms, this sector makes a large and growing contribution to aggregate GVA. While its share was already substantial at almost 18 percent in 1993, it rose to over 31 percent of GVA of non-family firms by 2019. Key contributors in this category include multinational software firm SAP and telecommunications company Deutsche Telekom. In contrast, ICT contributes significantly less to family firms' GVA, comprising just 4 percent in 2019. Although there are many family-controlled ICT firms included in the sample,

they tend to be relatively small.

Manufacturing dominates both family and non-family firms, though it plays a particularly significant role for the former. In 1993, manufacturing accounted for 89 percent of family firms' GVA, temporarily declining to about 75 percent before rising again to over 92 percent by 2019. This concentration reflects the presence of major family-controlled automakers like Volkswagen and BMW. However, manufacturing firms are also the most prevalent in numerical terms among family firms. In 2019, 78 out of a total of 149 family firms operated within this sector. Within manufacturing, the machinery subsector is particularly prominent, with companies such as Krones AG, a manufacturer of packaging and bottling machines, and KSB SE & Co. KGaA, a leading pump manufacturer. Family firms are also strongly represented among automotive suppliers (e.g., ElringKlinger AG, Schaeffler Technologies AG & Co. KG) and among producers of specialized tools, such as medical equipment (e.g., Drägerwerk AG & Co. KGaA). Although there are large manufacturing corporations among non-family firms, such as Bayer, BASF, and Mercedes-Benz, manufacturing's share in this group is significantly lower and declined notably, from 56 percent in 1993 to 37 percent in 2019.

Figure 5.6: Aggregate gross value added over industries



Aggregate gross value added (GVA) of family firms per industry as percentage of total GVA of family firms (left panel) and aggregate GVA of non-family firms per industry as percentage of total GVA of non-family firms (right panel). *Data:* Family Ownership and Governance database; Worldscope; author's calculations.

Companies in the service sector are generally underrepresented among publicly listed firms, reflecting their smaller size and lower capital requirements. Consequently, the share of service sector companies in the sample is significantly lower than in the overall corporate sector. Among family firms, service companies contributed less than 1 percent to GVA in 1993. While this share rose to around 10 percent by 2006, it fell back to approximately 1 percent by 2019. The decline is partly driven by firm exits, either through delisting or insolvency. Although the number of family-owned service companies listed on the stock exchange saw significant growth during the 1990s, it halved between 2004 and 2019.

Among non-family firms, the service sector experienced a different trend. Although service firms contributed less than 1 percent to the total GVA of non-family firms in 1993, its share increased steadily, reaching about 7 percent by 2019. The growth has however been largely driven by medical services provider Fresenius SE & Co. KGaA which, though long family-owned, has not been controlled by the respective family since the mid-2000s.

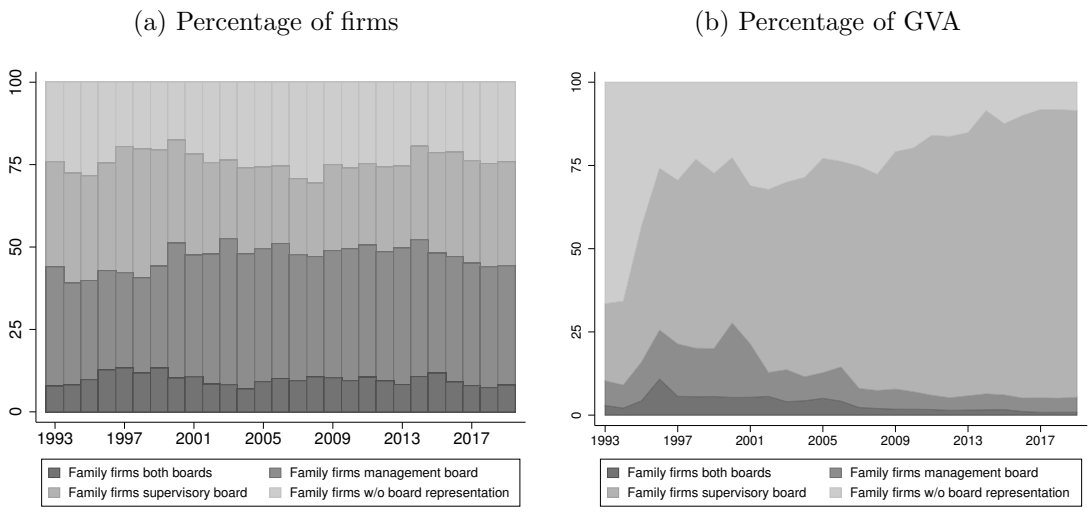
Transportation plays an almost negligible role among family firms. In contrast, its contribution to the GVA of non-family firms is substantial, rising from 5 percent in 1993 to 13 percent in 2019. This difference is a result of the dominance of a few large companies that are not family-controlled, such as the logistics company Deutsche Post. A similar disparity exists between family and non-family firms in the utilities sector. The sector contributes little to the aggregated GVA of family firms but represents a significant share of the GVA of firms with other ownership structures. Similarly to the transportation sector, the difference stems from the dominance by a few large entities, particularly electricity producers and distributors, which are either widely held, such as RWE AG and E.ON SE, or state-owned, like EnBW AG and Mainova AG. However, utilities exhibit an opposite time trend. While they accounted for 12 percent of the GVA of non-family firms in 1993, their share declined to just 5 percent by 2019.

The share of the trade sector among family firms initially increased starting in the 1990s but declined sharply after 2008, accounting for less than 2 percent in recent years. Again, firm exits and acquisitions play a significant role in the decline. For example, pharmaceutical wholesaler Celesio AG, previously owned by a family holding company, was acquired by US corporation McKesson in 2014 shifting the company from the family to the non-family firm group, which, given its size, had a corresponding impact on the trade sector's

share of total GVA among family firms. In the case of non-family firms, trade firms do not play a significant role, contributing around 5 percent to total GVA at the end of the observation period. More generally, trade companies, both wholesale and retail, share similar characteristics with service companies. Although they are not necessarily smaller than firms in other sectors, they are less likely to be publicly listed and are therefore underrepresented in the sample.[13]

Overall, manufacturing firms dominate among family firms, whereas this industry – though still highly significant – has been losing ground among non-family firms, particularly in favor of ICT, services, and transportation. The pronounced concentration of family firms in manufacturing helps also explain the higher share of family firms in aggregate assets relative to GVA (Figure 5.5), as manufacturing tends to be more capital-intensive and is characterized by higher asset-to-GVA ratios than other industries.

Figure 5.7: Board representation in family firms



Different types of family firms as percentage of all family firms: family firms with family representation on management board; family firms with family representation on supervisory board, family firms with representation on both boards, family firms without board representation (left panel). Aggregate GVA of different types of family firms as percentage of aggregate GVA of all family firms (right panel). *Data:* Family Ownership and Governance database; Worldscope; author's calculations.

Next, we turn to the different levels of family involvement into respective firms besides

[13]For example, large supermarket chains, such as Aldi or Lidl, which dominate the respective market in Germany, are privately owned.

ownership. Active family involvement in the strategic direction of companies is particularly evident when family members serve on the company's governing bodies, namely the management board and supervisory board. Figure 5.7 provides an overview of board representation of controlling families. Figure 5.7a shows the number of family firms grouped by different levels of board representation as percentage of the total number of family firms. Firms with family members represented on both boards account for less than 10 percent of all family firms in most years. Firms with at least one family member on the management board make up the largest share, reaching up to 40 percent. Firms with family members exclusively on the supervisory board or absent from both boards make up similar, smaller shares.

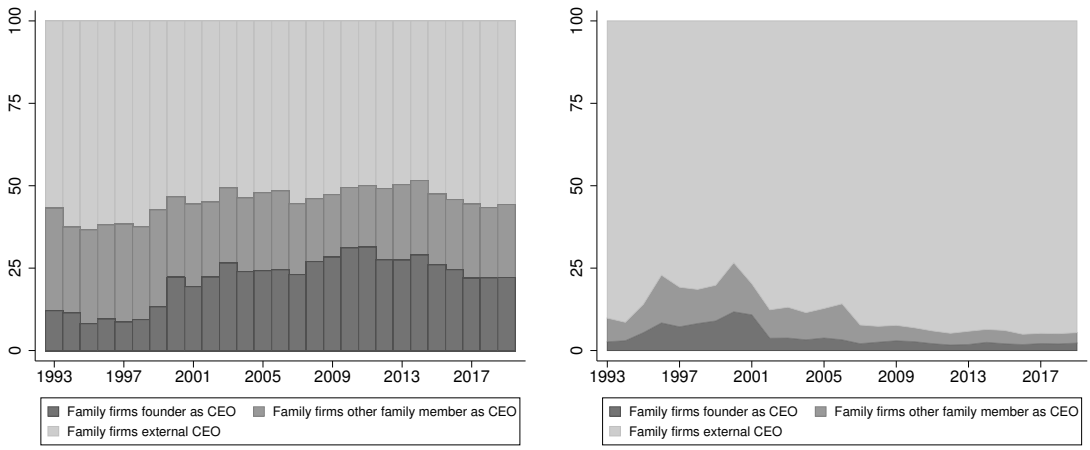
Figure 5.7b illustrates the contribution of each type to total GVA of family firms. Initially, firms without family board representation dominated, contributing over 66 percent of family firms' GVA. However, this share fell to 26 percent within three years and continued declining to less than 9 percent. In contrast, firms with family members on the supervisory board saw their GVA share rise from 23 percent to over 86 percent. This shift is not solely attributable to the strong growth of these firms but also to changes in board representation in individual firms. In particular, in firms reaching a certain age and size, owners seem to ensure close control through the supervisory board while delegating day-to-day operations to outside professionals. The remaining two categories contribute only small and declining shares to GVA. Notably, firms with family members only on the management board contribute a disproportionately small share to total GVA, reflecting their generally smaller size.

As various studies suggest, the impact of family control may vary depending on the generation of family members involved in firms' leadership (e.g., Villalonga and Amit, 2006; Bennedsen et al., 2007). Figure 5.8a categorizes firms by whether the CEO is a founder, a descendant or other family member, or an external manager. Over half of family-owned firms are led by external managers rather than family members, a proportion that has remained stable over time. Founder-led firms increased from 12 percent to 22 percent, while firms led by other family members declined from 31 percent to 22 percent, resulting in equal representation of these two groups in recent years.

Figure 5.8b shows that firms without family CEOs generate by far the largest share of

Figure 5.8: Founders and other family members in firm leadership

(a) Percentage of firms (b) Percentage of GVA



Different types of family firms as percentage of all family firms: family firms with founder as CEO; family firms with another member of the controlling family as CEO, family firms with an external CEO (left panel). Aggregate GVA of different types of family firms as percentage of aggregate GVA of all family firms (right panel).

GVA, aligning closely with the observation in Figure 5.7b that the bulk of value added is attributable to companies without family representation on the management board. Comparing the shares of companies led by family members (either founders or heirs) with the distribution across groups with the levels of board representation suggests that family representation on the management board typically means that a family member occupies the CEO position.

5.4 Labor Share and Saving among Family Firms

If the evolution of labor and saving shares, and consequently the corporate sector's financial surplus, is primarily driven by family firms, we would expect to see a sharper decline in the labor share and a stronger increase in saving among these firms. Figure 5.9 highlights the differences in the aggregate flow of funds between family and non-family firms.

The aggregate labor share clearly diverges between the two groups. Non-family firms experienced an initial decline during the 1990s before stabilizing at approximately 55 to 60 percent of GVA since the early 2000s. In contrast, the labor share of family firms exhibits

Figure 5.9: Components as percentage of GVA, family and non-family firms

Aggregate components for family and non-family firms as percentage of aggregate GVA in both groups: labor compensation (salaries and benefits expenses), taxes on income, interests calculated as interest expenses on debt net of non-operating interest income, payouts calculated as cash dividends paid and share buybacks net of non-operating dividend income, and gross saving. *Data:* Family Ownership and Governance database; Worldscope; author's calculations.

a persistent downward trend, interrupted only by temporary spike during the financial crisis. Over the entire period, it declined markedly by 17 percentage points, falling from about 67 percent to less 50 percent of GVA.

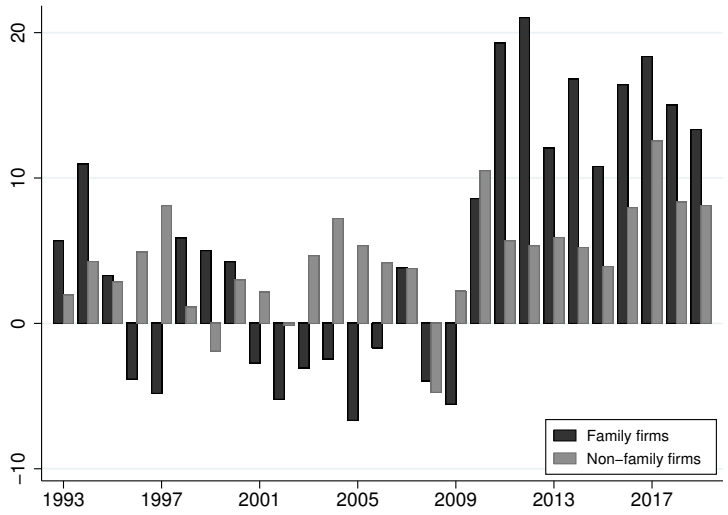
While tax and interest shares evolve similar across both categories, distribution policies reveal significant divergence. A common assumption is that family firms distribute more payouts because controlling families depend on them as primary source of income, given that much of their wealth is tied up in respective firm. However, another view suggests that their substantial ownership stakes generate payouts adequate for any level of private consumption even when distributions are modest relative to GVA. The latter explanation seems more plausible, especially given the trend since the early 2000s.

Payout levels, initially comparable through the 1990s, subsequently diverged substantially. Non-family firms increased distributions, reaching 8 percent of GVA by 2019 – five times the share in the early 1990s. Family firms, conversely, maintained distributions below 5 percent of GVA since the early 2000s. Both groups experienced temporary spikes in payout shares during the financial crisis, likely reflecting efforts to stabilize dividends amid sales shocks. The response was more pronounced in non-family firms, consistent with the importance of dividend continuity for market-dependent firms, as opposed to "patient capital" advantages of large anchor investors such as controlling families.

The most substantial differences between both groups emerge regarding gross saving. Non-family firms maintained relatively stable saving shares with around 30 percent of GVA in both 1993 and 2019. In contrast, the saving share of family firms expanded significantly, increasing by nearly 14 percentage points, from 25 percent to 39 percent of GVA. Consequently, family firms' more pronounced labor share decline corresponds with rising saving, while the moderate non-family firm labor share decline aligns with increased distributions without additional profit retention.

Figure 5.11 illustrates the aggregate financial balance for family and non-family firms. Non-family firms, with few exceptions, have consistently been net lenders, maintaining stable saving shares while investing at levels that consistently lag behind available internal funds. Family firms, on the other hand, show a contrasting pattern. Before the financial crisis, their financial balance was often negative, indicating reliance on external

Figure 5.10: Financial balance, family and non-family firms



Aggregate net lending/borrowing as percentage of aggregate GVA for family and non-family firms. *Data:* Family Ownership and Governance database; Worldscope; author's calculations.

funding. However, after the crisis, their balance turned persistently positive, with investment not keeping pace with the substantial rise in gross saving. To provide a sense of scale: in 2012, when family firms recorded their largest surplus, amounting to 21 percent of their aggregate GVA or 38 billion Euros in absolute terms, the current account surplus of the entire German economy amounted to approximately 200 billion Euros.

Overall, aggregate trends show remarkable differences between family and non-family firms in labor shares, the rise in corporate saving, and financial surpluses. However, given the concentration of family firms in manufacturing (Section 5.3), these differences might reflect industry-specific trends rather than the influence of family control. As shown in Table 5.4, industry-level trends reveal substantial heterogeneity in the evolution of labor and saving shares. While manufacturing industries demonstrate consistent patterns of declining labor shares and rising saving shares, other sectors exhibit divergent trajectories.

When considering all firms, significant trends in the expected direction are evident within the manufacturing sector, both at the aggregate level and in individual subsectors. Across all manufacturing firms, labor shares decline by over 6 percentage points per decade, while saving shares rise by 4 percentage points. In some subsectors, these changes are even more

Table 5.4: Trends in Labor and Saving Shares

	All firms		Family firms		Non-family firms	
	Labor	Saving	Labor	Saving	Labor	Saving
Industry	(1)	(2)	(3)	(4)	(5)	(6)
Agriculture & mining	-1.058	-2.624	-9.411***	11.210***	2.012	-8.730*
	(0.244)	(0.193)	(0.079)	(0.098)	(0.338)	(0.376)
Construction	-2.781*	-0.367	-10.271***	5.322***	-1.763	-1.379
	(0.163)	(0.135)	(0.163)	(0.131)	(0.211)	(0.193)
Information & communications	-3.276*	-2.259*	0.745	-4.955***	-3.565**	-2.083
	(0.163)	(0.125)	(0.117)	(0.103)	(0.171)	(0.132)
Total manufacturing	-6.262***	3.927***	-8.632***	8.126***	-4.888***	0.872
	(0.085)	(0.063)	(0.133)	(0.110)	(0.085)	(0.070)
Chemical & pharma	-5.004***	2.146***	-7.028***	6.809***	-4.711***	0.976**
	(0.080)	(0.045)	(0.089)	(0.071)	(0.083)	(0.047)
Electronics	-9.773***	7.336***	-9.344***	7.963***	-9.773***	6.788***
	(0.123)	(0.100)	(0.163)	(0.194)	(0.132)	(0.112)
Transportation equipment	-6.143***	3.700***	-6.269***	5.765***	-5.203***	0.488
	(0.086)	(0.096)	(0.168)	(0.170)	(0.113)	(0.132)
Rubber, plastic, glass, metal	-6.583***	3.895***	-11.621***	8.959***	-2.461**	-1.571*
	(0.107)	(0.073)	(0.115)	(0.098)	(0.105)	(0.089)
Other manufacturing	-3.433***	1.733**	-3.256***	2.690***	-3.547**	1.336
	(0.089)	(0.078)	(0.057)	(0.058)	(0.126)	(0.109)
Services	2.232***	-2.567***	-7.578***	4.469***	-1.098	0.586
	(0.067)	(0.072)	(0.122)	(0.115)	(0.097)	(0.109)
Transportation	1.420	-3.056***	1.420	-0.981	1.534	-3.092***
	(0.123)	(0.103)	(0.650)	(0.525)	(0.125)	(0.104)
Utilities	0.533	-7.720*	-11.205*	2.913	0.764	-7.872*
	(0.425)	(0.434)	(0.430)	(0.450)	(0.438)	(0.444)
Wholesale/Retail trade	2.449**	-4.455***	3.025*	-3.854***	0.758	-3.829***
	(0.066)	(0.070)	(0.123)	(0.088)	(0.105)	(0.067)
Total	-3.688***	0.667	-8.252***	7.613**	-1.819*	-2.209***
	(0.084)	(0.054)	(0.086)	(0.076)	(0.099)	(0.075)

The table presents trends (in percentage points per 10 years) in labor and saving shares, at the aggregate and industry level. Columns 1 and 2 show trends for all firms, columns 3 and 4 show trends for family firms, and columns 5 and 6 show trends for non-family firms. Robust standard errors are in parentheses. *, **, and *** denote significance at 10%, 5%, and 1% levels, respectively.

pronounced. In contrast, other industries show no significant trends or even opposing patterns. In particular, labor shares increase and saving shares decline in the service and trade sectors.

When focusing on family firms, the expected trends are evident across most industries. For all family firms, the labor share decreases by 8 percentage points, and gross saving increases by 7.5 percentage points per decade. While the trends are most pronounced in manufacturing, they are also significant in other industries, with the trade sector being a notable exception. This indicates that these developments are widespread among family firms and not confined to a single industry.

Non-family firms, on the other hand, exhibit a different pattern. In manufacturing, labor shares also decline, but saving shares increase significantly only in the chemicals and electronics subsectors. In other industries, trends are either insignificant or move in opposite directions, particularly evident in declining saving shares.

These divergent industry trends suggest that aggregate patterns cannot be solely attributed to the concentration of family firms in manufacturing. While non-family manufacturing firms also show declining labor shares and rising saving shares, these trends are more pronounced among family manufacturing firms and are evident across family firms in other industries. This could indicate either that manufacturing trends drive these patterns, amplified by family firms' dominance in the sector, or that the trends originate with family firms, with their manufacturing concentration reinforcing the effect.

To systematically examine how family control influences the distribution of value added, regression analyses are employed using the following equation:

$$y_{it} = \alpha + \beta F_{it} + \gamma X_{it} + \varepsilon_{it}, \tag{5.1}$$

where y denotes the dependent variable, F is a dummy indicating family firms, X represents a number of control variables, and ε denotes an error term. In each regression, the dependent variable is one of the components – labor compensation, interests, taxes, payouts, gross saving, investment, and net lending/borrowing – as percentage of GVA. This framework enables the identification of the effects of family control while accounting for other firm-specific characteristics. The models incorporate firm-level controls to ac-

count for potential confounding factors including firm size (measured through total assets), firm age (years since establishment), technological intensity (R&D to sales ratio), capital structure (leverage ratio), and firm-specific risk (stock return volatility). This selection of controls aligns with established empirical approaches in the literature assessing various aspects of corporate behavior and performance (e.g., Anderson and Reeb, 2003; Sraer and Thesmar, 2007; Lins et al., 2013). The models also include industry- and time-fixed effects and standard errors are clustered at the firm level. Using the baseline definition of family firms, the results of the regressions are presented in Table 5.5.

Table 5.5: Components of GVA and the role of family firms

	Compensation	Interest	Taxes	Payouts	Saving	Investment	Net Lending
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Family firm	-9.613***	-0.287	1.420***	0.989***	7.264***	-0.414	8.379***
	(1.583)	(0.228)	(0.255)	(0.326)	(1.540)	(1.122)	(2.268)
Log(Assets)	-5.199***	-0.179***	0.433***	0.420***	4.548***	0.024	4.986***
	(0.580)	(0.067)	(0.072)	(0.090)	(0.572)	(0.308)	(0.765)
Log(Age)	0.259	-0.356**	-0.449***	-0.285*	0.787	-3.516***	5.545***
	(0.955)	(0.147)	(0.157)	(0.172)	(0.917)	(0.795)	(1.441)
Debt/Assets	0.134**	0.227***	-0.063***	-0.056***	-0.239***	0.202***	-0.471***
	(0.054)	(0.010)	(0.007)	(0.009)	(0.054)	(0.035)	(0.078)
R&D/Sales	0.571**	-0.024	-0.121***	-0.052*	-0.305	2.371***	-2.837***
	(0.286)	(0.022)	(0.023)	(0.030)	(0.311)	(0.229)	(0.532)
Stock price vol.	0.079	-0.005	0.028**	0.052***	-0.172**	0.227***	-0.432***
	(0.087)	(0.008)	(0.013)	(0.015)	(0.084)	(0.068)	(0.124)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	10,148	10,148	10,148	10,148	10,148	10,148	10,148
Adj. R-squared	0.118	0.378	0.0841	0.0985	0.0780	0.274	0.118

The table presents the results of OLS regressions. Dependent variables are the different components of value added, in percent of value added. Family firm is a dummy variable indicating family ownership. Other explanatory variables are Log(Assets) (logarithm of book value of total assets), Log(Age) (logarithm of firm age measured in years plus one), Debt/Assets (leverage ratio), R&D/Sales (R&D intensity), Stock price volatility (standard deviation of a firm's stock price). All regressions include industry fixed effects and year fixed effects. Standard errors are clustered at the firm level. *, **, and *** denote significance at 10%, 5%, and 1% levels, respectively.

The estimates reveal substantial differences in the flow of funds between family and non-family firms. Family ownership is associated with a significant lower labor share, approximately 9.6 percentage points below comparable non-family firms. The reduced labor share corresponds to elevated corporate saving, which exceeds that of non-family firms by 7.3

percentage points. Although family firms incur higher taxes and distribute more payouts to shareholders, the differences are smaller than those in saving, indicating that additional profits from reduced labor shares are largely retained within firms. Regarding the use of gross saving, the analysis reveals no significant differences in investment spending relative to GVA between family and non-family firms. Instead, net lending by family firms is, on average, 8.4 percentage points higher than that of non-family firms. Overall, the pattern suggests a systematic reallocation of value added under family control.

The previous section revealed variations among family firms regarding the level of involvement of families beyond ownership stakes. Table 5.6 provides estimates for different types of family firms defined by the board representation of controlling families. Management board representation by controlling families yields the most pronounced effects on the flow of funds, with labor shares 12.2 percentage points below non-family firms. Supervisory board representation shows more moderate effects, reducing labor shares by 8.3 percentage points. Even in cases where families maintain ownership without direct board representation, labor shares remain 4.8 percentage points below non-family firms. These graduated effects indicate that the intensity of family influence shapes the magnitude of differences in the flow of funds.

Effects on gross saving mirror the differences in labor shares. In family firms where the controlling family is represented exclusively on the management board, the saving share is estimated to be 8.9 percentage points higher compared to non-family firms. For those with controlling family members present only on the supervisory board, the saving share is 6.5 percentage points higher. Family firms with no representation of the controlling family on either the management or supervisory boards still exhibit a higher saving share, with an estimated difference of 5 percentage points. Notably, in firms where the controlling family is represented on both the management and supervisory boards, the saving share is more than 9 percentage points higher than in non-family firms.

The largest effect on net lending in terms of GVA can be found for family firms with representation on the management board. These firms have, on average, a 10 percentage points higher share than non-family firms. Firms where members of the controlling family are part of the supervisory board are by far the largest contributors to aggregate GVA of family firms. In addition to their higher saving share, they also allocate almost 3 per-

Table 5.6: Components of GVA and the role of family board representation

	Compensation	Interest	Taxes	Payouts	Saving	Investment	Net lending
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Family MB	-12.578***	-0.408	2.123***	1.862***	9.022***	-0.019	10.103***
	(2.204)	(0.354)	(0.407)	(0.499)	(2.104)	(1.818)	(3.104)
Family SB	-8.346***	-0.136	0.975***	0.725	6.499***	-2.984**	10.010***
	(2.083)	(0.311)	(0.350)	(0.523)	(1.946)	(1.295)	(2.855)
Family MB and SB	-12.266***	-0.056	1.601***	0.879	9.048***	2.362	7.663*
	(2.696)	(0.616)	(0.515)	(0.690)	(2.545)	(2.530)	(4.271)
Family neither MB/SB	-5.631***	-0.376	0.825**	0.039	4.836**	0.952	4.143
	(1.952)	(0.269)	(0.360)	(0.356)	(1.985)	(1.648)	(3.143)
Log(Assets)	-5.275***	-0.182***	0.451***	0.439***	4.594***	0.059	5.006***
	(0.581)	(0.068)	(0.073)	(0.090)	(0.573)	(0.314)	(0.766)
Log(Age)	-0.008	-0.363**	-0.392**	-0.210	0.946	-3.520***	5.739***
	(0.965)	(0.148)	(0.158)	(0.174)	(0.929)	(0.810)	(1.453)
Debt/Assets	0.137**	0.227***	-0.063***	-0.057***	-0.240***	0.200***	-0.472***
	(0.054)	(0.010)	(0.007)	(0.009)	(0.054)	(0.035)	(0.078)
R&D/Sales	0.552*	-0.024	-0.118***	-0.048	-0.294	2.373***	-2.826***
	(0.283)	(0.022)	(0.023)	(0.030)	(0.310)	(0.227)	(0.527)
Stock price vol.	0.082	-0.005	0.028**	0.050***	-0.173**	0.231***	-0.437***
	(0.087)	(0.008)	(0.012)	(0.015)	(0.085)	(0.068)	(0.124)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	10,148	10,148	10,148	10,148	10,148	10,148	10,148
Adj. R-squared	0.120	0.378	0.0869	0.102	0.0785	0.275	0.118

The table presents the results of OLS regressions. Dependent variables are the different components of value added, in percent of value added. Family in MB, Family in SB, Family in MB and SB, and Family neither in MB nor SB are dummy variables indicating that the controlling family is represented either on the management board only, on the supervisory board only, on both boards, or on neither board. The other explanatory variables are consistent with Table 5.5. All regressions include industry fixed effects and year fixed effects. Standard errors are clustered at the firm level. *, **, and *** denotes significance at 10%, 5%, and 1% levels, respectively.

centage points less to investment than non-family firms. As a result, these companies also exhibit net lending almost 10 percentage points higher than that of non-family firms. For companies with representation on both boards, the effect is somewhat smaller, while for companies without board representation, the estimates show no significant difference.

Table 5.7 examines the impact of different CEO types in family firms. Founder-led organizations exhibit the largest differnces, combining substantially reduced labor shares (14.4 percentage points lower) and elevated saving shares (10 percentage points higher). The founder effect is smaller but still highly significant for family firms led by another family member and under external management with 11.3 and 6.4 percentage points lower labor shares, respectively.

Table 5.7: Components of GVA and the role of different CEO types in family firms

	Compensation	Interest	Taxes	Payouts	Saving	Investment	Net lending
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Founder CEO	-14.704***	0.194	2.399***	1.559***	10.158***	1.731	9.375**
	(3.010)	(0.559)	(0.560)	(0.598)	(2.821)	(2.190)	(4.554)
Member CEO	-11.487***	-0.661**	1.925***	1.762***	8.536***	-0.757	10.316***
	(2.325)	(0.332)	(0.449)	(0.608)	(2.219)	(2.126)	(2.905)
External CEO	-6.864***	-0.319	0.832***	0.448	5.616***	-1.104	7.193***
	(1.688)	(0.234)	(0.274)	(0.361)	(1.643)	(1.169)	(2.504)
Log(Assets)	-5.288***	-0.179***	0.452***	0.438***	4.602***	0.046	5.026***
	(0.580)	(0.067)	(0.072)	(0.090)	(0.573)	(0.313)	(0.766)
Log(Age)	-0.158	-0.314**	-0.370**	-0.241	1.023	-3.335***	5.619***
	(0.990)	(0.149)	(0.162)	(0.182)	(0.949)	(0.789)	(1.473)
Debt/Assets	0.136**	0.227***	-0.063***	-0.057***	-0.240***	0.202***	-0.473***
	(0.054)	(0.010)	(0.007)	(0.009)	(0.054)	(0.034)	(0.078)
R&D/Sales	0.556**	-0.024	-0.118***	-0.049	-0.296	2.373***	-2.829***
	(0.283)	(0.022)	(0.023)	(0.030)	(0.310)	(0.231)	(0.531)
Stock price vol.	0.083	-0.006	0.028**	0.052***	-0.174**	0.224***	-0.431***
	(0.087)	(0.008)	(0.012)	(0.015)	(0.085)	(0.068)	(0.124)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	10,148	10,148	10,148	10,148	10,148	10,148	10,148
Adj. R-squared	0.121	0.378	0.088	0.101	0.079	0.274	0.118

The table presents the results of OLS regressions. Dependent variables are the different components of value added, in percent of value added. Founder CEO, Member CEO, and External CEO are dummy variables indicating that a family firm is managed either by its founder, another family member, or an external CEO. The other explanatory variables are consistent with Table 5.5. All regressions include industry fixed effects and year fixed effects. Standard errors are clustered at the firm level. *, **, and *** denotes significance at 10%, 5%, and 1% levels, respectively.

Similarly, the most substantial effect on saving shares can be observed in founder-led family firms, where the saving share is almost 10 percentage points higher compared to non-family firms. In family firms led by a family member other than the founder, the saving share is 8.5 percentage points higher than in non-family firms. Family firms with an external CEO show a slightly smaller difference, with a 5.7 percentage point higher saving share. While no discernible difference in the share of investment spending is observed across different CEO types, net lending is significantly higher in all three types of family firms compared to non-family firms. Founder-led firms exhibit 9.2 percentage points higher net lending, while family firms led by another family member or an external CEO show net lending shares that are 10.3 and 7.2 percentage points higher, respectively.

While the previous regressions use a specific threshold to identify family firms, we turn now to the marginal effect of family ownership. Are the differences in components of GVA stronger the larger a family's ownership stake in a company? Table 5.8 shows the effect of the share in companies' control rights attributable to a family. The estimates suggest that a 1 percentage point higher share in the company owned by a family is associated in a 0.145 percentage point lower labor share, a 0.112 point higher saving share, and 0.114 point higher net lending relative to GVA. The results show that the reallocation of value added also occurs continuously with increasing family ownership.

Table 5.8: Components of value added and the role of family shares

	Compensation	Interest	Taxes	Payouts	Saving	Investment	Net lending
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Family share	-0.145***	-0.008**	0.021***	0.014***	0.112***	0.004	0.113***
	(0.024)	(0.003)	(0.004)	(0.005)	(0.022)	(0.019)	(0.034)
Log(Assets)	-5.188***	-0.187***	0.431***	0.417***	4.545***	0.045	4.949***
	(0.583)	(0.066)	(0.072)	(0.090)	(0.573)	(0.309)	(0.766)
Log(Age)	0.431	-0.350**	-0.475***	-0.303*	0.656	-3.511***	5.399***
	(0.954)	(0.147)	(0.159)	(0.174)	(0.913)	(0.792)	(1.436)
Debt/Assets	0.127**	0.227***	-0.062***	-0.056***	-0.233***	0.200***	-0.463***
	(0.054)	(0.010)	(0.007)	(0.009)	(0.054)	(0.035)	(0.078)
R&D/Sales	0.569**	-0.024	-0.121***	-0.052*	-0.304	2.371***	-2.836***
	(0.289)	(0.022)	(0.023)	(0.030)	(0.313)	(0.230)	(0.534)
Stock price vol.	0.073	-0.005	0.029**	0.052***	-0.167*	0.227***	-0.427***
	(0.088)	(0.008)	(0.013)	(0.015)	(0.085)	(0.069)	(0.125)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	10,148	10,148	10,148	10,148	10,148	10,148	10,148
Adj. R-squared	0.115	0.378	0.0816	0.0972	0.0768	0.274	0.117

The table presents the results of OLS regressions. Dependent variables are the different components of value added, in percent of value added. Family share refers to the share of a family in the control rights. The other explanatory variables are consistent with Table 5.5. All regressions include industry fixed effects and year fixed effects. Standard errors are clustered at the firm level. *, **, and *** denotes significance at 10%, 5%, and 1% levels, respectively.

The empirical evidence presents a consistent pattern of resource allocation that distinguishes family-controlled firms suggesting that family control, independent of other characteristics, is associated with a smaller proportion of value added being distributed to employees and a higher proportion retained in companies, without a corresponding increase in investment activity. Without attempting to establish a causal link in the strict

sense, it seems notable that the differences become more pronounced the greater the families' ability to influence firm behavior, either through a larger share in the companies' control rights or through involvement in management. This could suggest that the differences are indeed a result of a unique strategic orientation which family shareholders implement to a greater extent as their control and enforcement capabilities increase.

One notable detail in the differences in the flow of funds is that family firms appear to pay higher taxes (column 3 in Tables 5.5 to 5.8). While this pattern might initially appear counterintuitive as it is not immediately clear how family control would influence tax payments, it follows directly from the differences in labor shares. Given that corporate taxation is levied on profits rather than value added, effective tax payments are higher in firms with lower labor shares.

Similarly, payouts as a share of GVA are, on average, higher in family firms (column 4 in Tables 5.5 to 5.8). While family firms maintain higher payout ratios relative to value added, the magnitude of this difference is substantially smaller than the variations in labor and saving shares. This suggests a hierarchical pattern of profit allocation, where additional profits are not exclusively but primarily channeled into internal accumulation. Moreover, the significantly positive effect on payouts is refined to firms where family members are represented on the management board and those with founders or other family members as CEO. As demonstrated in Section 5.4, these firms represent a relatively small share of aggregate GVA, limiting their impact on aggregate developments.

The divergence in allocation of funds between family and non-family firms is also evident in their capital structure. Examining accumulated savings on corporate balance sheets, as shown in Table 5.9, reveals that family firms maintain significantly higher levels of retained earnings relative to total assets – approximately 16 percentage points more than their non-family counterparts, even after controlling for other relevant characteristics. Consistent with the patterns in the flow of funds, the differences become more pronounced when examining varying degrees of family involvement. Notably, founder-led family firms demonstrate the most striking effect, maintaining retained earnings levels that exceed those of non-family firms by more than 30 percentage points on average. The magnitude of these disparities is remarkable, particularly considering that the median retained earnings across all companies represents just 21 percent of total assets.

Table 5.9: Retained earnings on the balance sheet and the role of family firms

	Retained earnings / assets		
	(1)	(2)	(3)
Family firm	15.833***		
	(3.267)		
Family MB		22.342***	
		(4.560)	
Family SB		16.068***	
		(4.278)	
Family MB and SB		16.630***	
		(3.924)	
Family neither MB/SB		5.440	
		(4.977)	
Founder CEO			31.105***
			(6.369)
Member CEO			13.520***
			(4.834)
External CEO			10.860***
			(3.653)
Log(Assets)	8.893***	9.019***	9.050***
	(1.175)	(1.180)	(1.173)
Log(Age)	6.989***	7.615***	8.275***
	(1.423)	(1.474)	(1.534)
R&D/Sales	-3.045***	-3.005***	-3.029***
	(0.722)	(0.707)	(0.712)
Stock price vol.	0.249***	0.237***	0.228**
	(0.089)	(0.092)	(0.093)
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	10,168	10,168	10,168
Adj. R-squared	0.233	0.237	0.238

The table presents the results of OLS regressions. Dependent variables are retained earnings as percent of total assets. Family firm is a dummy variable indicating family ownership. Family in MB, Family in SB, Family in MB and SB, and Family neither in MB nor SB are dummy variables indicating that the controlling family is represented either on the management board only, on the supervisory board only, on both boards, or on neither board. Founder CEO, Member CEO, and External CEO are dummy variables indicating that a family firm is managed either by its founder, another family member, or an external CEO. All regressions include industry fixed effects and year fixed effects. Standard errors are clustered at the firm level. *, **, and *** denotes significance at 10%, 5%, and 1% levels, respectively.

Overall, these results provide crucial context for the findings presented in Chapter 4, which demonstrate that the decline in the aggregate labor share, and subsequently the increase in corporate saving, has been driven by a group of incumbent firms. The evidence suggests that this group largely overlaps with family-controlled enterprises, indicating that the significant role of family firms in the German economy has been a key factor in shaping the development of the corporate sector, including its transition to becoming a net lender to the rest of the economy.

These findings are particularly noteworthy in the context of previous research. Karabarbounis and Neiman (2014) and Chen et al. (2017) characterize declining labor shares and rising corporate saving as universal phenomena driven by common global factors. The evidence presented here suggests a more nuanced picture. In Germany, these developments are concentrated within family-controlled firms and exhibit significant industry variation. Considering the unique structures and institutions of national corporate sectors, the findings do not indicate family firms as universally applicable explanation. Instead, while declining labor shares and rising saving shares may be global phenomena, their underlying causes are country-specific.

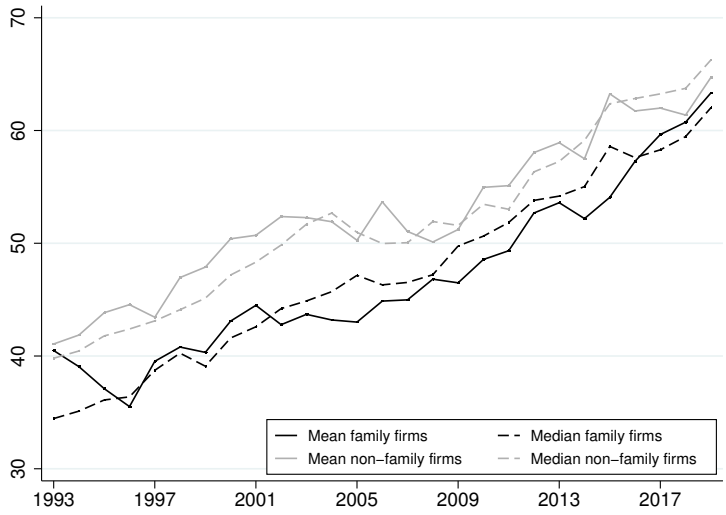
5.5 Wage Suppression and Productivity Growth

A critical issue for understanding the divergent labor share trends between family and non-family firms concerns the relative contributions of wage structures and productivity growth. The labor share differential between both groups could theoretically emerge through two distinct patterns: either through higher productivity amid comparable wage levels, or through lower compensation despite similar productivity. To distinguish between these possibilities, the evolution of both labor compensation and value added per employee are examined separately for an assessment of how each factor contributes to the observed differences between family and non-family firms.[14]

Comparing wages in both groups reveals persistent and systematic differences. As illus-

[14]For a more precise analysis, a comparison between compensation and value added per hour worked would be more appropriate. However, while *Worldscope* provides data on the number of employees, information on hours worked for individual firms is not available.

Figure 5.11: Wages in family and non-family firms



Average wages calculated as aggregate labor compensation per worker in each group in thousand Euros. Median wages calculated as median of labor compensation per worker in individual firms in each group in thousand Euros. *Data:* Family Ownership and Governance database; Worldscope; author's calculations.

trated in Figure 5.11, family firms consistently exhibit lower wages compared to non-family firms, both in terms of the mean and the median wage. The persistence of this wage differential across the observed period suggests a fundamental divergence in compensation rather than temporary variations. Notably, while the absolute wage levels differ, both firm types demonstrate parallel trajectories in wage development, indicating that the compensation gap has remained relatively stable over time. The consistency of this pattern across both mean and median metrics substantiates that this phenomenon reflects broader structural differences in compensation policies rather than being driven by outlier effects.

However, the more pronounced decline in labor share within family firms cannot be attributed solely to wage differentials. Figure 5.12 illustrates the evolution of average labor productivity and the median of labor productivity in family and non-family firms. While family firms initially lagged behind non-family firms in productivity, a notable convergence has occurred over time. This convergence is particularly pronounced in average productivity, potentially indicating exceptional productivity gains among larger family firms. The trend is, however, also evident, albeit more moderate, in median productivity levels, suggesting a broader development across family firms. The simultaneous observation of

Figure 5.12: Labor productivity in family and non-family firms

Average labor productivity calculated as aggregate GVA per worker in each group in thousand Euros. Median productivity calculated as median of GVA per worker in individual firms in each group in thousand Euros. *Data:* Family Ownership and Governance database; Worldscope; author's calculations.

productivity convergence and persistent wage differentials explains the stronger decline in the labor share of family firms.

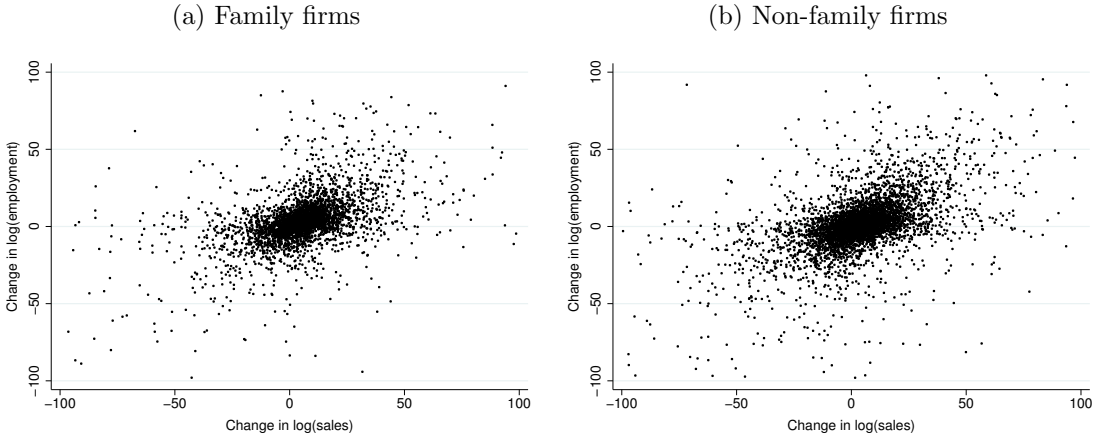
The subsequent question is how family firms have successfully managed to suppress wages despite significant productivity increases. As argued by Baccaro and Höpner (2022), the systematic decentralization of collective bargaining since the 1990s has fundamentally reshaped wage-setting in the German economy. The institutional transformation occurred against the backdrop of restrictive monetary policy, the challenging economic restructuring of the former German Democratic Republic, and intensifying competition from emerging low-wage manufacturing centers in Eastern Europe. These concurrent pressures led workers to increasingly prioritize security over wage growth. Within an increasingly fragmented bargaining framework, workplace agreements emerged that linked wage restraint to job preservation (Baccaro and Benassi, 2016).

The literature on implicit labor contracts in family firms suggests a mechanism through which they might achieve lower wages: their enhanced capacity to make credible commitments to employment security. Family firms' distinctive characteristics – including long-term orientation and reputational concerns – could strengthen their ability to establish

and maintain implicit contracts with their workforce. As the decentralization increasingly shifted wage-setting authority from industry-wide arrangements to firm-level negotiations, employees in family firms may be even more willing to forgo wage increases than those in non-family firms.

While a comprehensive analysis lies beyond the scope of this study, the available data offer no evidence to support the hypothesis that differences in labor compensation are associated with greater job security. To evaluate whether family firms offer enhanced job security in exchange for lower wages, the following analyses examine the relationship between sales fluctuations and employment adjustments across firm types. If family firms indeed provide higher employment security, one would expect to observe a weaker correlation between changes in sales and changes in employment compared to non-family firms. Figure 5.13 presents the relationship between annual logarithmic changes in sales and employment for both family and non-family firms. The data reveal a clear positive correlation between the changes, indicating that employment levels are systematically adjusted in line with sales fluctuations. However, no discernible difference between family and non-family firms is visible. Both types of firms appear to respond similarly to sales shocks.

Figure 5.13: Changes in sales and employment security, family and non-family firms



Change in the logarithm of firms' total employment × 100 and change in the logarithm of firms' total sales × 100. *Data:* Family Ownership and Governance database; Worldscope; author's calculations.

To provide more rigorous examination, the following equation is estimated:

$$\Delta \log y_{it} = \alpha + \beta \Delta \log s_{it} + \beta F_{it} \Delta \log s_{it} + \beta \log \text{assets}_{it} + \beta \log \text{age}_{it} + \varepsilon_{it}, \tag{5.2}$$

where $\Delta \log y_{it}$ represents the change in the logarithm of employment and $\Delta \log s_{it}$ denotes the change in the logarithm of sales for firm i between periods t-1 and t. F denotes the family firm dummy. All models include industry and year fixed effects. Table 5.10 presents the estimation results, with columns (1)-(3) reporting findings for the full sample and columns (4)-(6) focusing specifically on observations with negative sales changes – cases where the employment reaction is especially relevant to the question whether family firms provide higher job security. Columns (1) and (4) provide estimates based on the baseline ownership definition of family firms. Columns (2) and (5) differentiate between the four types of family firms based on the board representation of controlling families, while columns (3) and (6) distinguish family firms by CEO type.

The regression results consistently demonstrate a highly significant relationship between sales and employment changes, confirming the effective transmission of sales shocks to employees. However, the interaction terms between family firm dummies and sales changes reveal no significant moderating effect of family control on this transmission mechanism. This finding is robust across various types of family control. Especially, considering families' involvement in management and supervisory board does not alter the general result.

Interestingly, the transmission of negative sales shocks to employees exhibits greater magnitude than that of positive shocks, though again, family firms show no general mitigating effect. A significant difference emerges only in family firms where family members are represented in both the management board and supervisory board. However, as previously demonstrated, these firms contribute only marginally to aggregate value added, making it improbable that this effect accounts for the differences in aggregate developments. The empirical evidence thus provides no comprehensive support for the hypothesis that family firms offer enhanced employment security relative to their non-family counterparts. Despite their distinctive characteristics and the documented differences in the flow of funds, the family firms in this sample do not seem to provide the employment stability often attributed to them in the implicit labor contract literature.

Table 5.10: Employment and sales shocks

	Full sample			Negative sales shocks		
	Δlog(employment)					
	(1)	(2)	(3)	(4)	(5)	(6)
Δlog(sales)	0.455***	0.456***	0.455***	0.497***	0.497***	0.495***
	(0.067)	(0.067)	(0.067)	(0.121)	(0.121)	(0.121)
Family firm × log(sales)	-0.014			-0.042		
	(0.107)			(0.140)		
Family in MB × log(sales)		0.134			0.037	
		(0.088)			(0.127)	
Family in SB × log(sales)		-0.238			-0.203	
		(0.211)			(0.276)	
Family in MB and SB × log(sales)		0.274			-0.299**	
		(0.284)			(0.145)	
Family neither MB/SB × log(sales)		-0.098			0.038	
		(0.137)			(0.196)	
Founder CEO × log(sales)			-0.008			-0.072
			(0.094)			(0.152)
Member CEO × log(sales)			0.300**			0.087
			(0.120)			(0.128)
External CEO × log(sales)			-0.156			-0.096
			(0.135)			(0.191)
Log(assets)	0.691***	0.714***	0.712***	0.486*	0.486*	0.499*
	(0.141)	(0.139)	(0.139)	(0.264)	(0.259)	(0.259)
Log(age)	-1.750***	-1.697***	-1.796***	-2.942***	-2.946***	-2.839***
	(0.357)	(0.345)	(0.340)	(0.744)	(0.714)	(0.724)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	9,239	9,239	9,239	3,204	3,204	3,204
Adj. R-squared	0.254	0.270	0.272	0.225	0.232	0.228

The table presents the results of OLS regressions. Dependent variable is the change in the log of employment. Family firm is a dummy variable indicating family ownership. Family in MB, Family in SB, Family in MB and SB, and Family neither in MB nor SB are dummy variables indicating that the controlling family is represented either on the management board only, on the supervisory board only, on both boards, or on neither board. Founder CEO, Member CEO, and External CEO are dummy variables indicating that a family firm is managed either by its founder, another family member, or an external CEO. Columns 1 - 3 show results for the full sample, columns 4 - 6 show results considering only observations with negative changes in sales. All regressions include industry and year fixed effects. Standard errors are clustered at the firm level. *, **, and *** denotes significance at 10%, 5%, and 1% levels, respectively.

These findings raise important questions about the mechanisms driving wage differentials between family and non-family firms. If lower wages do not come with compensatory benefits in terms of job security, what, then, explains the observed differences? One possibility is that employees maintain perceptions of job security that diverge from empirical reality, leading them to accept lower wages without receiving corresponding benefits. Alternatively, the wage-productivity disparity might stem from information asymmetries in the labor market. While wage comparisons across firms are relatively transparent, workers face significant challenges in assessing firm-level productivity trends. This information gap may enable family firms to maintain lower wages even as their productivity converges with non-family firms, as workers focus primarily on absolute wage levels rather than wages relative to productivity. Lastly, differences in workers' bargaining power in family and non-family firms may contribute to these disparities possibly through systematic differences in labor organization.

However, these possibilities cannot be addressed within the scope of this study or with the available data. Accordingly, the precise channel through which family firms achieve more effective wage suppression, and by extension, a lower labor share, remains incompletely understood, highlighting the need for further research into this phenomenon. Future research incorporating detailed data on labor organization, worker perceptions, and firm-level bargaining processes could illuminate the underlying mechanisms.

6. Data and Conceptual Challenges

The empirical findings presented in the preceding chapters contribute to our understanding of family firms' distinctive role in shaping developments in the German corporate sector, while simultaneously revealing critical methodological challenges. Beyond specific empirical questions concerning the flow of funds, several interconnected issues impede comprehensive analysis and understanding of the corporate sector at both macro and micro levels. These encompass data limitations, conceptual issues, and measurement approaches – factors that collectively warrant careful reconsideration regarding the reliability and generalizability of earlier interpretations.

The subsequent sections examine these methodological challenges in detail, analyzing their implications for our understanding of corporate sector developments and suggesting potential approaches for addressing these limitations in future research.

6.1 Availability and Properties of Firm-Level Data

As outlined in Chapter 4, the firm sample provides a reasonably robust representation of the German corporate sector. However, a truly comprehensive analysis and definitive conclusions would require access to significantly more extensive data. While publicly listed firms account for a substantial share of the sector's value added, a full disaggregation of macroeconomic trends would necessitate not only additional information on a broader array of firms but also differently structured data. Ideally, such an analysis would rely on micro-level data capturing the domestic activities of all firms within the corporate sector.

Although a dataset enabling a complete bottom-up reconstruction of macroeconomic trends is unlikely to materialize, improving public access to firm-level data would represent a considerable step forward. Such advancements could address many of the questions raised by this study's findings. Achieving even approximate coverage of the entire corpo-

rate sector would require detailed data on a large number of privately held firms. However, this presents significant challenges. Unlike publicly listed firms, privately held companies face fewer disclosure obligations and, as smaller entities that are often less oriented toward capital markets, they frequently lack both the incentive and capacity to voluntarily share detailed financial information. Consequently, data on these firms remains underrepresented in major databases that primarily rely on capital market disclosures. This limitation is evident not only in the *Worldscope* database used in this analysis but also in other commonly referenced sources, such as the *Compustat* database frequently cited in empirical literature. While the *BvD Orbis* database, and its German subset *Dafne*, include a significantly broader set of privately held firms, they too are not without limitations (e.g., Kalemli-Ozcan et al., 2015). Key gaps remain, particularly for essential indicators required to disaggregate macroeconomic trends. Even basic data points, such as annual profits, are only available for a small fraction of the firms included in these datasets (Demary et al., 2021, p. 45).

For Germany, additional data sources could, in principle, complement existing datasets. The *Bundesbank* offers the *USTAN* and *JANIS* databases, which include financial data not only for publicly listed firms but also for a large pool of privately held companies (Deutsche Bundesbank, 2024*a*). However, these datasets are anonymized, making it impossible to identify individual firms – a critical limitation for linking the data to other sources, particularly when analyzing characteristics such as detailed ownership structures. As demonstrated in this study, ownership structures can be documented comprehensively through the manual collection of publicly available information. Unfortunately, anonymized datasets preclude such an approach.

The *Bundesbank* cites legal constraints tied to its data collection methods as justification for anonymization (Becker et al., 2024, p. 4). Yet it seems feasible to make a database with the relevant information publicly accessible, as the information in question does not involve sensitive internal company matters and is already publicly available for other firms. The German approach to granting access to government-collected data could undoubtedly be more flexible, as evidenced by the significantly higher levels of transparency in Scandinavian countries.

The second major challenge in achieving a more detailed dissection of national accounts

time series lies in isolating the domestic activities of individual firms. This task extends beyond analyzing unconsolidated financial data, as many multinational corporations operate not only foreign subsidiaries but also numerous domestic ones. Furthermore, metrics such as the share of foreign sales – sometimes available in firm-level databases – offer limited utility in this context. These figures often fail to clarify whether they pertain to domestically produced goods that are subsequently exported or to goods manufactured by foreign subsidiaries. For direct comparability with national accounts data, it is essential to have information disaggregated from a production perspective. Indicators such as labor compensation or gross fixed capital formation, for instance, should ideally be differentiated based on the country where the associated activities occur.

A significant development in this area has been the introduction of Country-by-Country Reports (CbCRs), which mark a relatively recent step toward increased transparency in the international operations of multinational corporations. These reports were originally designed to address issues such as profit shifting and tax avoidance, providing jurisdiction-specific financial information for each country where a multinational firm operates. The framework for these disclosures is established under *OECD BEPS Action 13*, and firms exceeding a certain revenue threshold in member states of the *Inclusive Framework* where national laws have implemented these guidelines are required to submit CbCRs to tax authorities (OECD, 2024).

In Germany, this reporting requirement has been in place since 2016, with German multinationals filing CbCRs from that year onward (OECD, 2023). However, these reports are not publicly accessible, though they have occasionally been made available for research purposes.[1] Some companies voluntarily publish their CbCRs, but this practice remains limited, with only a small number of disclosures originating from German firms. For instance, the CbCR database maintained by the *EU Tax Observatory*, which compiles voluntarily published CbCRs, includes only a handful of German companies, most of which are in the financial services sector (Aliprandi et al., 2022).

Even more problematic is that the items required for disclosure under the OECD framework fall short of what is needed to disaggregate macroeconomic trends related to the

[1] See for example the analysis of profit shifting in multinational corporations headquartered in Germany using CbCR data in Fuest et al. (2022).

corporate flow of funds. Ideally, the accounting items outlined in Section 4.1 would be available to calculate GVA and its components at the firm level. However, the *OECD BEPS Action 13* framework mandates the disclosure of just ten items, such as revenue, profits, and employee numbers, on a country-by-country basis. The absence of key data, particularly labor compensation disaggregated by country, unfortunately renders the currently available information inadequate for extending the analyses presented in this study. Nonetheless, these reports represent a significant step toward greater transparency, including for the questions addressed in this study.

Enhanced access to data on privately held firms, combined with continued development of country-by-country reporting, would yield substantial benefits for future research in this field. Such data could, for example, help clarify whether the observed divergence in labor share trends between macro and micro data stems primarily from different trajectories in small versus large firms or is more closely tied to the relocation of production abroad. Given that these issues are not only of academic interest but also carry substantial policy implications, one can hope for progress in this area in the near future.

6.2 Goodwill and Investment

As previously argued, indicators such as the labor share and corporate saving and investment should not be analyzed in isolation but rather in the context of the broader flow of funds as they are are necessarily connected through accounting identities. For example, a declining labor share is necessarily mirrored by an increase in the profit share. An increase in corporate saving must be attributed either to a rise in profits or a change in the saving rate. Changes in the financial surplus or deficit result either from variations in retained funds or from changes in the acquisition of assets. This context is crucial for accurately interpreting individual developments, whereas isolated analyses often fail to reveal the underlying changes.

It is equally important to ensure precise interpretation of individual indicators. For instance, the financial balance is frequently described as the difference between corporate investment spending and corporate saving. However, this interpretation is technically im-

precise. Rather, the financial balance represents the difference between internally available funds, including gross saving and net capital transfers received, and expenditures on the acquisition of non-financial assets.

Expenditures on non-financial assets, however, encompass items that do not qualify as investment in the macroeconomic sense. For example, if the corporate sector reduces the share of value added allocated to gross fixed capital formation (GFCF), this does not necessarily affect the financial balance if firms redirect spending toward the acquisition of other non-financial assets. The contribution of inventories, for instance, is often overlooked despite being a key target of capital allocation that influences the financial balance.

A particularly notable case in this context are expenditures on mergers and acquisitions (M&A) resulting in additions to goodwill on the balance sheet. Although goodwill is conceptually included in the national accounts, it is missing from German time series. However, as discussed in Chapter 4, goodwill has grown significantly at the firm level, potentially affecting the macroeconomic flow of funds. It therefore seems relevant to discuss the nature of goodwill and specifically whether, or to what extent, additions to goodwill should be considered investment in intangible assets.

In this context, it is essential to distinguish between two different questions that address separate issues. The first question is whether goodwill should be included in the national accounts time series. This question can be easily answered. Goodwill as an asset, as well as related flows, are conceptually included in the system of accounts. Moreover, firm-level data suggests that corresponding flows and stocks play a non-negligible and growing role in Germany. The absence of these items, therefore, leads to a increasing misrepresentation of corporate expenditures on the macro level. It remains unclear why the *Federal Statistical Office* does not include the relevant items in Germany's time series, given that data on M&A deals, as well as information on goodwill from publicly available balance sheets for a large number of firms, are accessible. While the data may be incomplete and require further refinement – as is the case with most data sources – primary information on the corresponding flows and stocks are nonetheless available.

The second question is more fundamental and more difficult to answer. Is the categorization of goodwill in the national accounts plausible or should related flows be subsumed

under investment? This question touches on the core issue of what should be considered an investment from a macroeconomic perspective.

To approach the question of how goodwill and the corresponding flows should be valued in the national accounts, it may be useful to first examine the firm-level perspective. At the firm level, there are two distinct perspectives on what constitutes an investment. The first is an accounting perspective, which defines expenditures as investment if they represent the acquisition of assets that are subsequently recorded on the balance sheet. The specific type of asset is irrelevant in this context. For example, the purchase of machinery can be considered an investment in physical capital, just as the acquisition of securities can be regarded as an investment in financial assets.[2] In contrast, expenses which do not lead to an expansion of the balance sheet are not considered investment.

Following the firm-level accounting perspective, as defined in accounting frameworks, particularly the International Financial Reporting Standards (IFRS), spending on mergers and acquisitions (M&A) are categorized as part of the investing cash flow. This classification seems reasonable, as it expands the acquiring firm's balance sheet, primarily through the consolidation of the target firm's assets. Regarding the excess cost of acquisition – the premium paid above the target's book value of net assets – it is assumed that additional underlying assets are involved, which is why it is recorded as goodwill on the balance sheet, without further specification of its nature. As argued, for example, by Giovanazzi et al. (2024), one interpretation of goodwill is that it represents assets that possess inherent value to the firm but are not routinely identified or distinguished in accounting. It is only when a transaction occurs that the value of intangible assets such as organizational capital, established supplier relationships, customer lists, and other non-routine items are "uncovered" and subsequently recognized as goodwill.

The second perspective, which could be referred to as the management perspective, aligns most closely with an intuitive or common-sense understanding of investment. In this view, investment encompasses spending made with the intention of expanding productive capacity and/or increasing future profits. Typically, this includes items that are acquired and subsequently become part of the balance sheet, such as machinery or equipment. How-

[2]This excludes only specific cases in which nothing is "acquired", such as cash, which is technically an asset, or receivables resulting from operational activities.

ever, this perspective often extends to expenditures like R&D and employee development, which do not immediately affect the balance sheet. Nevertheless, since these expenses are incurred with the aim of achieving future success, they can also be considered investment from this point of view.

Accordingly, M&A spending would still be regarded as an investment. Whether goodwill reflects an actual underlying asset is irrelevant from this perspective. For instance, a premium on the acquisition price may be paid for reasons aligned with a firm's strategic interests, without necessarily representing additions to productive assets. In extreme cases, companies might acquire competitors solely to eliminate them from the market, thereby stifling innovation.[3] From a strategic management standpoint such actions might still qualify as investments due to their potential to enhance future profits. From an accounting perspective, the appropriateness of categorizing goodwill as an asset in such contexts is, however, questionable.[4] Accounting frameworks circumvent this issue by leaving undefined what exactly goodwill represents.

To determine whether flows associated with goodwill qualify as investment in a macroeconomic sense, three key criteria must be met. First, consistent with firm-level accounting principles, goodwill must represent an actual asset. If it merely reflects a form of expense aimed at boosting future profits, it would not qualify as investment under macroeconomic definitions. Second, the macroeconomic definition is even more stringent, requiring the asset to be a produced one, meaning it must be created through labor. Third, such assets must be newly produced during the period in question. Otherwise, they would merely represent a transfer of ownership of existing assets, without expanding the overall capital stock.[5] Only under these conditions can goodwill be considered part of the capital stock, with additions to it recognized as investment.

The first criterion would be satisfied if one adheres to firm accounting logic. For the sake

[3]This practice is, for example, described by Cunningham et al. (2021) under the term "killer acquisitions".

[4]Premiums could be paid for even less comprehensible reasons, such as selfish motives of the management, making a categorization as valuable investment even questionable from a management perspective. In reality, firm combinations regularly fail to deliver the anticipated value for one reason or another, despite promises of value creation (Capron, 2016).

[5]A special case would be the acquisition of assets from abroad by a sector. In this case, the capital stock of the domestic sector would be expanded, which would be an investment from a national perspective, even though the global capital stock remains unchanged.

of argument, let us assume that goodwill represents intangible assets that are difficult to quantify, but nonetheless real, such as organizational capital or similar elements. However, can it also be classified as a produced asset? The national accounts in their current form, specifically ESA 2010, categorize goodwill as a non-produced asset, a classification that initially appears plausible. Yet, upon closer scrutiny, this categorization becomes less straightforward. To gain further clarity, it is instructive to examine how other intangible assets, such as patents, are treated within the national accounts.

Patents themselves are not produced investment goods in the traditional sense either. Rather, they are exclusive usage rights granted to an actor by state authority. Since patents are durable and valuable, they are unquestionably considered assets from a firm-level perspective and should be included in the balance sheet. But why are they also seen as part of the capital stock in macroeconomic contexts? A patent is backed by a flow variable, expenditures on research and development (R&D), without which the patent would not exist. Thus, recording the patent is a second-best solution to account for know-how created through development efforts as an asset. Since R&D expenditures primarily consist of labor compensation, it can also be said that the resulting assets are "produced through labor". The expenditures are effectively assumed to correspond to the "production cost" of the patent. This approach allows the integration of unquestionably valuable assets, crucial to the production process and derived from prior work, into the measurement of the capital stock without breaking the fundamental logic of national accounts.

Regarding goodwill, the question arises whether it represents a similar case. Given the considerable resources companies invest in building customer relationships or organizational capital, also primarily in the form of compensation for employees who are entrusted with the corresponding tasks, one could argue that these assets are also "produced through labor" in a certain sense. The problem is that, unlike R&D, there is no financial flow systematically measured in this regard. Rather, the expenses are distributed across various items, typically included in overall labor compensation or intermediate consumption. There is no unified flow item representing the corresponding expenditures. However, if these assets are uncovered through corporate transactions, this can be seen as a second-best solution to include them in the national accounts balance sheets.

The final criterion addresses whether these assets are newly produced goods. In a strict

sense, they are not. The "production" of these assets occurs not simultaneously with the acquisition of the company, but rather beforehand, typically over several years or even decades. The key issue, however, is that these assets are not measured prior to the transaction. This means that the balance sheet – or more precisely, the capital stock, if one follows the previous argument – is technically expanded at the moment of acquisition by assets that were previously unaccounted for. Ideally, these assets should be measured at the time of their creation. Nevertheless, as long as this is not the case, one could argue that their subsequent inclusion represents a second-best solution for reflecting the relevant firm activities.

Overall, it seems plausible to argue that goodwill and corresponding flows should be incorporated into the analysis of macroeconomic trends. The classification as investment remains subject to debate, as there are plausible counterarguments, particularly due to the inherent ambiguity surrounding the rationale for paying premiums that exceed net asset values in individual cases. Nevertheless, a broader discussion on how these items should be categorized is essential, especially given the growing significance of factors such as organizational capital in the production process and the increasing tendency of firms to acquire assets through the purchase of other companies. Regardless of evaluation, the discussion should be based on accurately measured flows and stocks in order to assess their macroeconomic significance.

6.3 Measuring Financial Flows and Stocks in the National Accounts

A key issue affecting the understanding of developments in the corporate sector concerns financial transactions and financial stocks in Germany as reported in the national accounts. As discussed in Chapter 3, net lending/borrowing from non-financial transactions and net financial transactions from financial accounts – which should theoretically be equal – differ significantly and inconsistently. At first glance, it is unclear whether the source of the discrepancies lies in the non-financial or financial transactions. However, while non-financial transactions demonstrate a relatively stable trend that aligns with many other observations regarding the German economy, financial transactions exhibit a more erratic

pattern that seems implausible. For instance, net financial transactions accounted for over 9 percent of GVA in 2013, only to drop to -4 percent in 2014 (see Figure 6.1a), according to the financial accounts largely due to a net increase in other accounts receivable exceeding 120 billion Euros in 2013, followed by a net decrease of more than 140 billion Euros the following year. Although such changes are not impossible, they are difficult to comprehend, and no real-life events emerge that might plausibly explain these drastic shifts.

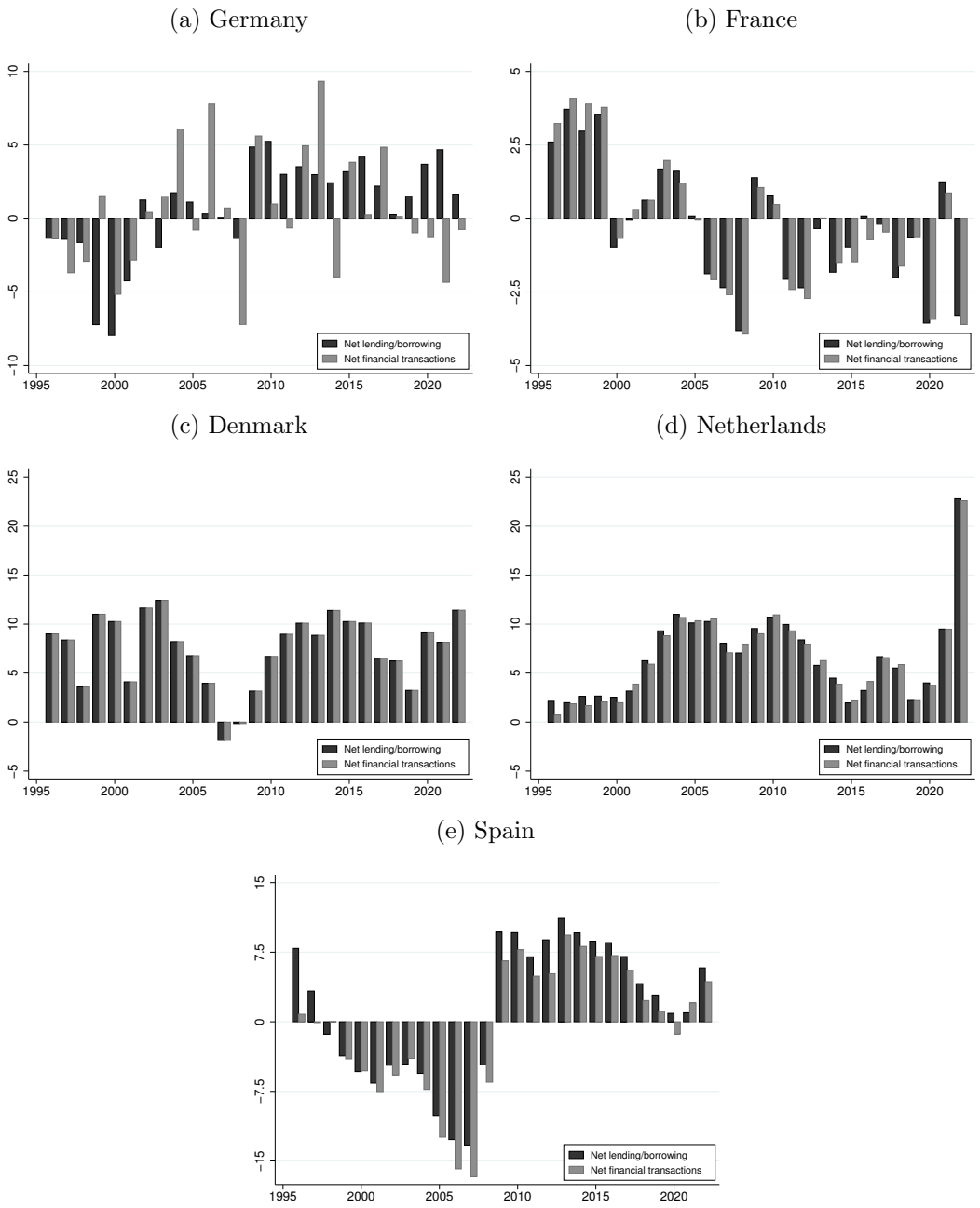
Interestingly, this issue seems to be specific to German data. Figure 6.1 displays both indicators for Germany alongside selected European countries, and none show inconsistencies comparable to those observed in Germany. In fact, in countries as diverse as France, Denmark, the Netherlands, and Spain – despite their distinct institutions and data infrastructure – reported financial and non-financial transactions align closely, with deviations appearing to be limited to minor statistical discrepancies.

To assess the plausibility of transactions as recorded in financial accounts, it is essential to examine how different categories of financial assets are measured, both in terms of their stocks and the acquisition or disposal of respective assets. While the guidelines are established in ESA 2010, and the principles of application as well as the primary data sources for Germany are published (Deutsche Bundesbank, 2024*c*), the raw data are not publicly accessible, making it difficult to pinpoint exactly where potential inconsistencies may arise. Nevertheless, there are asset classes for which valuation is well-documented and can be compared to other publicly available sources. A closer examination of these cases may provide insights into the challenges in measuring financial accounts.

The valuation of distinct categories of equity is the most feasible to trace and cross-check for plausibility. ESA 2010 broadly differentiates between three groups of equity: shares in publicly listed and unlisted corporations, investment fund shares, and other equity which is not in the form of marketable securities. The last category includes ownership rights in private limited companies and quasi-corporations (Eurostat, 2013, p. 178). In Germany, this applies, for example, to companies with the legal forms of GmbH, KG, or OHG.

As described in Chapter 3.1, equity can be both an asset or a liability to the non-financial corporate sector, with the exception of investment fund shares, which can be owned by non-financial corporations but only represent a liability to financial corporations. By def-

Figure 6.1: Corporate net lending/borrowing and net financial transactions, Germany and other European countries



Net lending/borrowing and net financial transactions of the non-financial corporate sector as percentage of corporate GVA in the respective country. *Data:* Eurostat (2024); author's calculations.

inition, equity which represents a liability to the corporate sector represents an asset to another sector and vice versa. Acquisitions and disposals of equity on both sides of the balance sheet represent financial transactions. The valuation of equity thus directly determines the corresponding portion in the flow measures in the financial accounts.

Regarding the valuation of equity stocks in Germany, some problems become apparent. For 2018, the value of "other equity" owned by German households was reported in the national accounts balance sheets as roughly 220 billion Euros (Deutsche Bundesbank, 2024*b*). This figure, although in a similar range to adjacent years, seems implausible for various reasons. Considering that this category includes, next to thousands of small and medium sized business, companies such as Bosch, Boehringer Ingelheim, Schwarz Group, Aldi, and Würth – firms that, if compared to similar publicly traded companies, would likely be worth tens of billions of Euros and are domestically owned – it becomes clear that the reported figure was far too low. As Albers et al. (2022) point out, the *Manager Magazin* rich list indicates for the same year that the wealthiest 1,000 individuals hold a combined wealth of more than 900 billion Euros, with the majority of this wealth concentrated in privately held corporations or quasi-corporate entities. Furthermore, the official data for Germany would have implied a share of business assets in total household wealth of just 16 percent, compared to an estimated 30 percent in, for example, the US (Saez and Zucman, 2016). Since estimates for publicly traded corporate shares are likely more reliable, this particularly suggests an underestimation of the equity held in closely held firms and quasi-corporations.

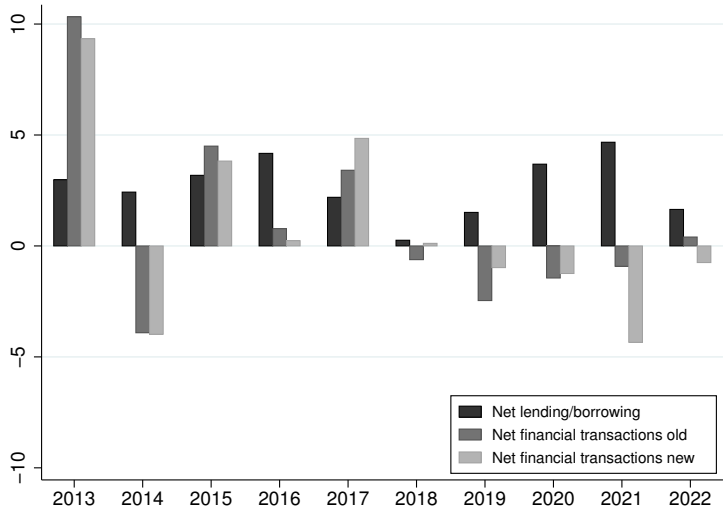
To address the apparent underestimation of business assets in their German wealth distribution series, Albers et al. (2022) provide new estimates for closely held corporate equity and equity of quasi-corporations. Adopting the methodology recommended by the US Federal Reserve for evaluating privately held companies (Ogden et al., 2016), they calculate these valuations by applying market value-to-revenue ratios from publicly traded companies to the earnings of closely held firms and quasi-corporations derived from income tax data, incorporating a discount to reflect the lower liquidity of these shares.[6] Through this approach, they estimate a total equity value of 1,660 billion Euros for these companies. The robustness of these estimates is supported by Demary et al. (2021), who

[6]Whithout providing a detailed methodology, the European System of Accounts outlines a similar approach (Eurostat, 2013).

arrive at comparable valuations for business assets in Germany, though using a different methodology.[7]

This significantly higher figure refers specifically to equity held by German households. However, if we assume that German households do not primarily own private companies abroad (or firms included in the financial corporate sector) and receive taxable income from them, this also indicates that the corresponding equity in the German non-financial corporate sector – reported in 2018 at 853 billion Euros in the financial accounts (Deutsche Bundesbank, 2024*b*) – has been clearly underestimated. This does not directly explain the volatility of financial transactions, but it does show that the measurement of financial assets is subject to significant uncertainty. As mentioned earlier, the valuation of stock quantities also directly impacts the corresponding flow figures. If similar issues arise in the case of other asset classes, it would go a long way in explaining the discrepancies in the national accounts.

Figure 6.2: Net lending/borrowing, net financial transactions before and after 2024 revision



Net lending/borrowing of the non-financial corporate sector in percentage of GVA. Net financial transactions before ("old") and after 2024 national accounts data revision ("new"), both in percentage of corporate GVA. *Data:* Eurostat (2024); Deutsche Bundesbank (2024*b*); author's calculations.

[7]For a comparison of different estimates of business assets in household wealth in Germany see Giovanazzi and Victor (2024).

Since then, however, the Bundesbank has conducted a comprehensive revision of financial accounts, introducing substantial changes in the measurement of equity for privately held firms (see also Chapter 3.2). For the years from 2016 onward, privately held equity has been reassessed based on individual firm-level financial statements (Deutsche Bundesbank, 2024*d*). For 2018, this adjustment increased the value of private equity held by German households from 220 to 560 billion Euros, while closely held equity as liability of the non-financial corporate sector was revised upward from 853 to 2,287 billion Euros. Although the revised figures for household wealth still seem low compared to other estimates, the evaluation of equity is certainly more plausible than before the revision.

Next to this methodological change, the revisions, conducted as part of the benchmark revision of national accounts and balance of payments data (Destatis, 2024*d*), included corrections to individual transactions. Yet, while the updated calculations for privately held equity appear more credible, this is not necessarily the case for other areas. As shown in Figure 6.2, the revision has, in some instances, even exacerbated discrepancies between non-financial and financial transactions.

It is unclear why the relevant institutions, particularly the *Bundesbank*, have not addressed these inconsistencies, even though the national accounts undergo regular reviews and revisions. Until these measurement issues are resolved, a consistent and credible picture of financial flows at the macroeconomic level in Germany will remain elusive, leaving analysis fragmented and definitive interpretation impossible.

6.4 Corporate Net Worth in the National Accounts

In close relation to the measurement of assets and transactions, a discussion seems warranted on how to treat retained earnings in the national accounts. An increase in gross saving relative to value added suggests, regardless of how saving is used, an accumulation of retained earnings. If these retained earnings are not reflected in (estimated) market prices of equity in the national accounts, they contribute to an increase in the net worth of the corporate sector. In stark contrast to the household sector, where assets are ultimately owned by the actors which comprise the sector, corporations, from a consolidated

perspective, cannot truly "own" themselves. Ownership rights, including all previously retained earnings, ultimately belong to entities outside the corporate sector.

For example, even if one corporation is owned by another within the sector, the ownership structure ultimately traces back to an external party or individual who holds ownership rights over all underlying assets. Despite the complexity of ownership structures, each asset can, in theory, be traced back to a final owner, making any concept of "net worth" within the corporate sector alone theoretically inconsistent. The fact that the net worth of the German non-financial corporate sector in 2022 is reported as more than 34 percent of total assets in the published data appears highly problematic in this context, as it reveals how little the data series ultimately conveys.

The discrepancy arises from the differing valuation methodologies applied to the two sides of the corporate sector's balance sheet. While the asset side is, in a certain sense, valued at book value, equity on the liability side is measured at market value. This approach results in the inclusion of factors on one side that are excluded from the other.

On the asset side, ESA 2010 mandates all assets to be valued at market prices (Eurostat, 2013, p. 174). However, as direct market prices are unavailable for many assets, alternative valuation methods are employed. Tangible assets, such as machinery and equipment, are typically valued at historical acquisition costs, adjusted for depreciation (Eurostat, 2013, p. 175). Similarly, expenditures on R&D, which represent a substantial portion of intangible assets, are directly incorporated into the balance sheet as aggregated costs (Eurostat, 2013, p. 183). This methodology aims to approximate the market value of such assets. However, it differs substantially from evaluating the bundled assets of individual firms and aggregating them. The latter approach would consider factors such as the synergies between assets or their perceived future relevance, elements that are not captured in the former valuation framework.

In contrast, the liability side partially adopts the opposite approach. Equity is not recorded based on the aggregated book value of firms' equity but rather as the sum of their (estimated) market capitalization (Eurostat, 2013, p. 178). However, the market valuation of firms inherently reflects numerous factors that are often unrelated to the value of the underlying assets. This divergence can lead to potential discrepancies between the asset

and liability sides, which manifest in the sector's net worth.

To illustrate, consider a hypothetical corporate sector that, for simplicity, is comprised of a single firm that owns only physical capital and operates without debt. Assume that this firm is owned by individuals within the household sector of the same country. Under the national accounts framework, the firm's assets would be valued based on historical acquisition costs minus depreciation. For instance, if the firm owns two pieces of equipment, each originally purchased for 70,000 Euros but now valued at 50,000 due to wear and tear, the total assets of the sector would amount to 100,000 Euros.

At the same time, let's assume the company operates in a sector that the market perceives as having little future potential, resulting in a low market valuation due to a lack of investor interest. For example, assume that the firm's market capitalization amounts to 30,000 Euros. In the national accounts, this market capitalization would be recorded as the sector's equity, yielding a net worth for the corporate sector of 70,000. The 30,000 Euros market capitalization would, in turn, be recorded as an asset of the household sector. However, where the 70,000 Euros of net worth should be accounted for remains unclear.

One perspective might argue that the 70,000 Euros do not exist because the assets do not collectively hold the corresponding value, implying an overvaluation by the national accounts. Alternatively, one could assert that the valuation is accurate from a macroeconomic perspective. In this case, the 70,000 Euros would need to be attributed to the ultimate owner – in this example, the domestic household sector. While it remains unclear which approach better captures economic reality, the internal consistency of the national accounts framework requires adherence to one of these interpretations.

This conceptual issue becomes particularly problematic in practice when the (estimated) market valuation of companies is systematically low relative to the value of their assets. This is highly likely the case in Germany due to the high prevalence of family control, and the fact that corporate savings formation predominantly occurs within family firms. The "market price" and, by extension, the valuation of equity in the national accounts, reflects the price an investor is willing to pay for a share of the firm's equity at a specific point in time. When a firm has a controlling shareholder – particularly in cases of multigenerational family ownership with strong incentives to retain control – the market price

primarily represents the value an external investor would pay for a passive stake, without the prospect of substantial influence or access to retained earnings. The more valuable component, the controlling share, is not part of the "market" as long as the family does not intend to sell it. The bias becomes increasingly consequential as family-controlled firms rely more heavily on internal funds for financing. As a result, family ownership is likely to negatively impact market valuations, regardless of the actual value of the firms' assets.

In other words, the accumulation of savings by family firms is not reflected in market value, as it primarily benefits controlling families rather than external investors. The downward bias is likely even more pronounced in privately held companies as retained earnings are not comprehensively accounted for in any of the common valuation methods. This is likely one of the key factors contributing to the substantial gap between the total stock of internal funds and the market value of equity reported in the national accounts for the German corporate sector. Consequently, the current national accounts time series fall short of accurately capturing measures of income and wealth distributions. Developing a better understanding of the relationship between the corporate sector and income and wealth of its ultimate owners – particularly in Germany – requires addressing the inconsistencies within the national accounts framework.

7. Concluding Remarks

The analysis in this dissertation characterizes the German corporate sector through its institutional continuity, with manufacturing maintaining a distinct and persistent position. Through systematic documentation of ownership structures and controlling families' involvement in management and supervision of publicly listed companies across decades, this work, for the first time, demonstrates empirically the sustained influence of individual families on the flow of funds, even among Germany's largest and most internationally oriented corporations. While firm ownership initially resides with individuals or families across most economies, Germany's institutional framework has uniquely enabled families to maintain control even as firms evolved into multinational enterprises.

Although the precise mechanisms remain to be fully understood, family-controlled firms in Germany systematically exhibit lower wage levels compared to non-family enterprises. During the economic integration of emerging markets, which generated substantial demand for products characteristic of German family firms' manufacturing portfolios, these companies experienced exceptional growth. The absence of proportionate wage adjustments led to declining labor shares, facilitating a significant redistribution of income from workers to controlling families. However, this redistribution manifested not through increased payouts but through the systematic accumulation of corporate savings. Amid weak domestic demand, family-owned firms largely refrained from reinvesting these funds, resulting in substantial financial surpluses.

The analysis of firm-level patterns underlying the decline in the aggregate labor share yields robust conclusions for publicly listed companies. The central role of family-controlled firms in these developments indicates fundamentally different patterns from those documented in other economies, particularly the US. Furthermore, the evidence demonstrates that increased corporate saving among German publicly listed companies emerges directly from declining labor shares. Given that this decline predominantly stems from family firms, they appear to be the primary driver of both rising corporate saving and financial sur-

pluses. While direct extrapolation presents challenges, there are good reasons to believe that these firm-level patterns have significantly shaped macroeconomic developments.

The precise allocation of the corporate sector's surplus, however, remains empirically ambiguous. At the macro level, systematic inconsistencies in national accounts preclude definitive conclusions. Analysis of publicly listed companies at the micro level indicates partial linkages to goodwill resulting from M&A activities, though this evidence remains inconclusive. In particular, the macroeconomic relevance of the increase in goodwill among publicly listed firms remains unclear.

These findings indicate two critical areas for future research. First, extending the systematic analysis of the flow of funds to non-listed companies would be crucial. Despite significant data constraints, such expansion would contextualize the present findings and enable more precise assessment of their macroeconomic implications. Second, understanding the specific financial flows underlying the German corporate sector's financial surplus requires further investigation. This study demonstrates substantial gaps in our understanding of these flows. Given Germany's position as a primary current account surplus economy, with the corporate sector widely considered to be instrumental in this regard, enhanced comprehension of these flows would substantially advance our understanding of global imbalances in general. Future developments in data infrastructure and measurement methodology will hopefully facilitate progress in both areas.

Notwithstanding these constraints, the findings provide substantial insights into the German corporate sector's structural characteristics and their implications for economic development. Within a broader context, these characteristics appear increasingly relevant to emerging challenges. Understanding contemporary developments in the German corporate sector requires particular attention to two recent events that, though seemingly only loosely connected, appear to be of particular significance. The first concerns the re-election of Donald Trump as President of the United States in November 2024. The second relates to the ongoing crisis at Volkswagen, Europe's largest automotive manufacturer which, like many of Germany's largest firms, is controlled by a single family.

The Trump presidency has been characterized by numerous controversial positions, yet his sustained emphasis on trade imbalances holds particular relevance in this context. During

his first term, Trump consistently identified trade relations with China as a critical concern but also repeatedly criticized Germany's trade surplus vis-à-vis the US. This rhetoric, leading commentators to wonder about his "strange fixation" with Germany (Toosi, 2018), has resurfaced in his recent campaign.[1]

The prospect of Trump enacting import tariffs during his second term has sparked considerable debate, with many analysts predicting significant repercussions for the German economy (e.g., Obst et al., 2024; Felbermayr et al., 2024). While the accuracy or internal coherence of Trump's analysis of trade imbalances can be questioned, as can the feasibility of his proposed solutions, the underlying issue demands serious consideration. International organizations have long underscored the risks associated with global trade imbalances – warnings that have often gone unheeded in German policy circles (e.g., Parkin and Donahue, 2013; IMF, 2017*b*; European Commission, 2024). The fact that this issue has been brought to the forefront by the leader of the world's largest economy underscores the need for German policymakers to address it proactively. Beyond preparing for potential policy changes, there is a pressing need to critically examine the structural factors that have contributed to Germany's persistent current account surplus and the associated challenges.

German companies have not only established strong export relationships with the US but have also significantly benefited from the demand for industrial goods from emerging economies, particularly China. However, China's economic model itself is inherently structured around generating trade surpluses. The symbiotic relationship, wherein Germany provides China with advanced capital goods, has been sustained largely because China, in turn, maintains an even larger trade surplus, especially with the US. These relationships face increasing strain in a global context where the US is implementing import tariffs to address trade imbalances, and China has advanced its technological capabilities to the extent that it is no longer reliant on German imports. Consequently, there is a growing risk that the German business model, which heavily depends on this interdependence, may become untenable. The critical question is whether Germany can manage a controlled and orderly transition to a more sustainable economic model or whether such a shift will occur in a more disruptive manner, carrying unpredictable and potentially profound societal

[1] Statements regarding Germany's trade surplus have been widely documented and extensively discussed (e.g., Müller, 2017; McHugh, 2017; Prakash, 2024).

repercussions.

Addressing the risks posed by trade imbalances and declining export markets requires a broader economic transformation, centered on sustainable growth in household incomes across the broader population. Redirecting income flows toward individuals with a higher propensity to consume – rather than, as in Germany's case, channeling it to affluent owners of family firms through corporate saving – would sustainably strengthen domestic demand. Rebalancing the German economy through stronger domestic demand could be pursued via two pathways. The first involves reducing exports while simultaneously increasing domestic consumption of goods produced locally. The second entails raising import levels while sustaining high export volumes.[2] In light of recent developments, where one key trading partner is adopting protectionist measures, while another increasingly aims at producing goods it previously imported from Germany independently, the latter option appears increasingly unrealistic.

However, the first pathway necessitates not only a significant rise in the incomes of the broader population but also structural adjustments to the economy from a supply-side perspective. Specifically, it would involve reorienting production toward goods that cater to domestic demand. In essence, a resilient and flourishing German domestic economy would require less reliance on industrial goods needed in rapidly industrializing emerging markets and a reduced emphasis on products, such as high-end automobiles, which predominantly appeal to countries with pronounced personal income inequality and status-driven consumption behaviors.

A reorientation toward a more domestically oriented economy does not imply an abandonment of Germany's export capabilities. Rather, it suggests a shift in the growth model to reduce Germany's disproportionate reliance on external demand as the primary driver of economic growth. Similarly, such a shift does not imply that Germany should abandon its focus on manufacturing altogether. There are compelling reasons to believe that manufactured goods will continue to play a pivotal role, particularly in areas where Germany possesses historical specialization and well-established technology clusters. This is especially true in sectors dominated by family firms. For instance, the production of med-

[2]For more extensive versions of these arguments see for example Pettis (2013); Klein and Pettis (2020); Behringer and van Treeck (2018); Behringer et al. (2020).

ical equipment will remain crucial in light of Germany's aging population. Specialized components, for example in optical measurement technology and photonics, represent a strategically vital segment of the digital economy's value chain.

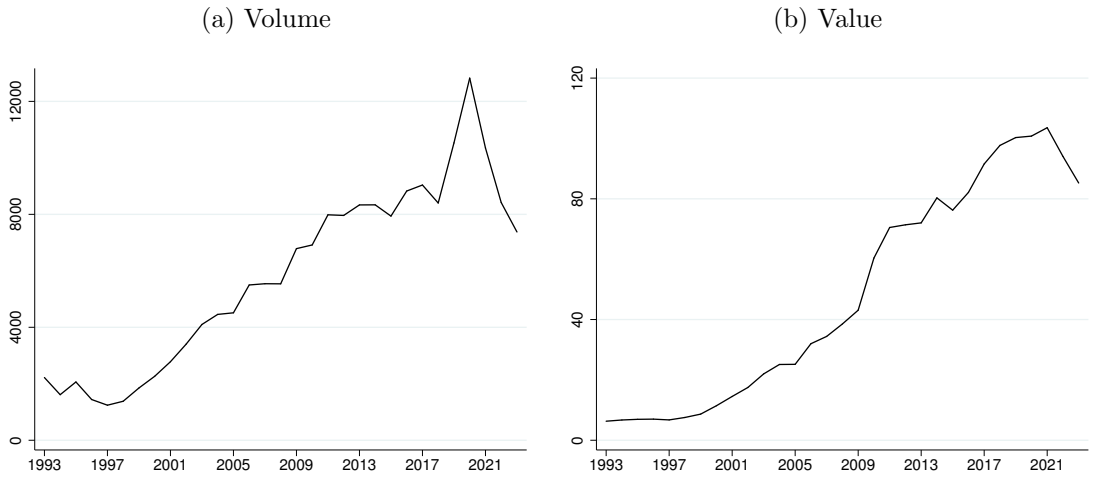
The importance of manufacturing becomes even more apparent in addressing environmental challenges. The transition to a carbon-neutral economy will necessitate a wide range of advanced capital goods, which many family firms – currently oriented toward exports to emerging markets – are well-equipped to produce. The automobile industry provides an even more obvious example. Transforming the transportation sector will require the production of millions of electric vehicles for the German market alone and even more across the European Union. There is no reason why these vehicles should not be manufactured by German firms, provided they adapt more closely to the needs of domestic consumers.

This brings us to the second event. In October 2024, Volkswagen unveiled plans for a series of sweeping measures, including the termination of its long-standing job guarantee, reductions in employee salaries, the closure of entire production facilities, and the prospect of substantial layoffs (e.g., Brächer et al., 2024). While such restructuring might be regarded as significant yet within the realm of normal business adjustments in other countries, the implications for Germany – a nation deeply rooted in economic stability where mass layoffs are rare exceptions – were akin to an earthquake. The announcement prompted widespread alarm, with commentators warning that "Germany's successful model is at risk of collapse" (Lübberding, 2024).

While sales figures in the European market have remained stable and even shown growth in the Americas, the crisis is primarily attributable to declining sales in China (Volkswagen Group, 2023, 2024). The scale of the measures announced suggests that the leadership has acknowledged the gravity of the situation. However, it remains uncertain whether a coherent and viable strategy will emerge from their response. A realignment aimed at reducing dependence on China and focusing on domestic markets does not appear to be under serious consideration. Instead of pursuing a sustainable alternative strategy, there seems to be an unwavering commitment to preserving the existing business model.

This reluctance to adopt a strategic refocus seems also evident in the strong opposition of German car manufacturers to import tariffs on Chinese cars (e.g., Barrett and Feil,

Figure 7.1: Germany's exports to China



Export volumes in thousand tons (left panel). Export values in billion Euros, adjusted to 2021 export prices (right panel). *Data:* Destatis (2024*c*,*e*); author's calculations.

2024), including political lobbying leading the German government to oppose the introduction of such tariffs (Scheer et al., 2024). Regardless of any assessment regarding the efficacy of such measures, decision-makers appear primarily concerned that these tariffs might provoke retaliatory actions by Chinese authorities, potentially endangering their sales markets in Asia. However, the extent to which the rise of Chinese car manufacturers – particularly with regard to electric vehicles – threatens their existing business model and necessitates a comprehensive transformation irrespective of any direct response from the Chinese government to EU tariffs, seems to be less obvious to those in charge.

Volkswagen's current crisis exemplifies the challenges facing broad segments of the German economy. The fact that family firms are primarily responsible for the decline in the corporate labor share and the rise in corporate saving, as demonstrated in this dissertation, is not necessarily encouraging in this context. Legacy and the desire to retain control in family firms are likely to create a path dependency that makes reorientation difficult. Consequently, it remains uncertain whether these firms are capable of repositioning themselves and shifting away from a narrow focus on "competitiveness" – an approach that seems ill-suited to addressing the challenges ahead.

Paradoxically, the very accumulation of savings highlighted in this study along with the resulting independence from external capital (Braun and Deeg, 2020) could place family

firms in a favorable position to drive the supply-side transformation. The financial resources for the necessary investments are readily available, provided the requisite will to act is present.

In the case of individual firms, the adherence to an allegedly inescapable export strategy is somewhat understandable. As described above, a shift toward a more domestic-focused economy would require an increase in labor income, which would effectively amount to a redistribution of income from company owners. Expecting them to show engagement in this regard seems illusory. Moreover, even if they recognize their own potential benefits from an overall economic expansion, individual firms have little influence on aggregate demand. Therefore, to initiate adjustments, public policy measures aimed at strengthening domestic demand seem essential, for example regarding taxation of labor income, but particularly regarding public investment. These measures would serve as a prerequisite for encouraging transformation among corporations. Subsequently, wages in the corporate sector could rise, which would further strengthen demand in the medium and long term, placing the German economy on a more sustainable growth trajectory.

Unfortunately, the prevailing perspective among Germany's corporate leadership on the necessary changes to strengthen the economy appears to be shared almost unanimously by politicians across all parties. While the magnitude of the current challenges is acknowledged, many of the proposed measures may primarily contribute to a further internal devaluation – precisely the strategy that played a central role in creating the imbalances in the first place.[3] The persistent reliance on such strategies reflects a broader political consensus that prioritizes Germany's identity as a "competitive export nation," even at the expense of addressing structural problems. However, waiting for change until export markets have faded will only make the inevitable transformation of the German economy unnecessarily painful, offering potential for even more profound societal upheavals. Despite this, there remains the opportunity to tackle these issues head-on. A model that capitalizes on the strengths of Germany's historically established structure, especially those in family firms, while developing more flexibility to adapt to new challenges, appears not only desirable but also within reach.

[3]See, in particular but not exclusively, the economic policy proposals of the *CDU*, which is currently leading in the polls for the next federal election (CDU, 2025).

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A. Supplementary Figures and Tables

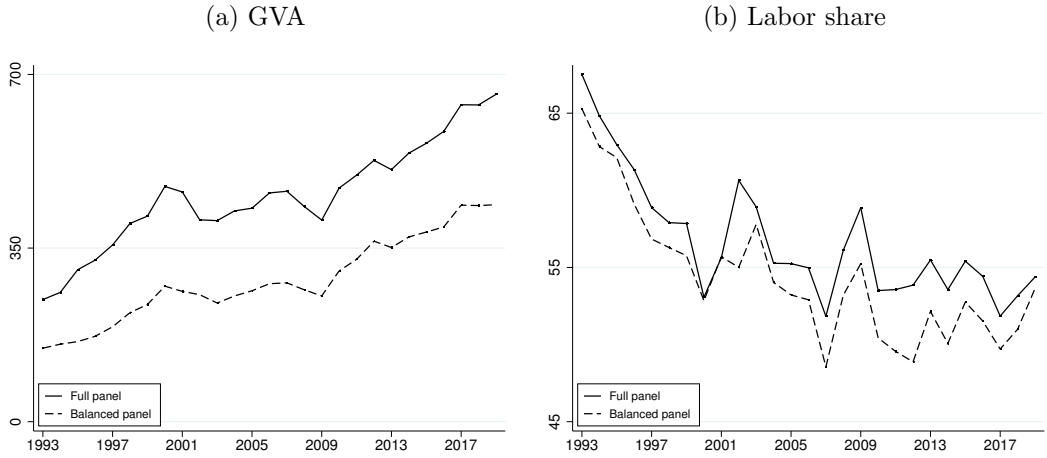
Table A.1: Financial variables from Worldscope database

Variable	*Worldscope code*
Sales or revenues	WC01001
Salaries and benefits expenses	WC01084
R&D expenditures	WC01201
Interest expense	WC01251
Interest income	WC01266
Dividend income	WC01268
Income tax	WC01451
Cash & equivalents	WC02001
Receivables	WC02051
Inventories	WC02101
Other investments	WC02250
Long-term receivables	WC02258
Investments in associated companies	WC02256
Property, plant & equipment	WC02501
Intangible assets	WC02649
Total assets	WC02999
Accounts payable	WC03040
Accrued payroll	WC03054
Dividends payable	WC03061
Income taxes payable	WC03063
Total debt	WC03255
Provisions for risks & charges	WC03260
Total liabilities	WC03351
Retained earnings	WC03495
Total shareholders' equity	WC03995
Cash dividends paid	WC04551
Capital expenditures	WC04601
Share buybacks	WC04751
EBITDA	WC18198
Goodwill	WC18280
Market capitalization	WC08001
Market price month end	WC05015 – WC05070
Number of employees	WC07011
SIC code	WC07021
Founding year	WC18272

Table A.2: Industry classifications

Industry	*SIC Code*
Agriculture & Mining	0111–1499
Construction	1521–1799
Information & Communication	7371–7379; 4812–4899
Total Manufacturing	2011–3999
Chemical & Pharma	2812–2999
Electronics	3571–3589; 3612–3699
Transport Equipment	3711–3799
Rubber, Plastic, Glass, Metal	3011–3499
Other Manufacturing	2011–2796; 3511–3569; 3592–3599; 3812–3999
Services	7011–7363; 7381–8999
Transportation	4011–4581; 4724–4789
Utilities	4612–4619; 4911–4971
Wholesale / Retail Trade	5012–5999

Figure A.1: Full and balanced panel



Aggregate GVA in full and balanced sample in billions of Euros. Aggregate labor share as percentage of aggregate GVA in full and balanced panel.

Table A.3: Use of profits

	Gross saving		Taxes		Interests		Payouts	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GOS	0.822***	0.966***	0.140***	0.050***	-0.021**	-0.060***	0.074***	0.040***
	(0.021)	(0.023)	(0.008)	(0.007)	(0.010)	(0.008)	(0.008)	(0.008)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
GVA weighted	Yes	No	Yes	No	Yes	No	Yes	No
Observations	557	557	557	557	557	557	557	557
R-squared	0.758	0.779	0.402	0.119	0.182	0.118	0.312	0.089

Estimated coefficients and their standard errors from firm-level regressions of the time trend (in percentage points per 10 years) in the ratio of components to GVA on the time trend in GOS to GVA.

Table A.4: Use of gross saving

	Investment		Net lending / borrowing	
	(1)	(2)	(3)	(4)
Gross saving	-0.108***	-0.235***	1.231***	1.404***
	(0.029)	(0.026)	(0.034)	(0.035)
Industry FE	Yes	Yes	Yes	Yes
GVA weighted	Yes	No	Yes	No
Observations	557	557	557	557
R-squared	0.271	0.162	0.757	0.764

Estimated coefficients and their standard errors from firm-level regressions of the time trend (in percentage points per 10 years) in the ratio of investment and net lending / borrowing to GVA on the time trend in gross saving to GVA.

Table A.5: Categories of shareholders

Category	*Description*
Individual/family	Individuals as well as groups of people related directly or by marriage.
Family holding/foundation	Firms whose sole purpose is to own assets (no operating business) and which are owned/controlled by a single individual or family. Includes foundations if a single individual or family are ultimate beneficiaries or if the foundation is charitable but de facto controlled by family members.
Institutional investor	Entities which pool money to purchase assets on behalf of their clients, including but not limited to banks, insurance companies, investment advisors as well as pension funds, investment funds, and hedge funds.
Firm in same/related sector	Widely-held firm operating in the same or a related sector. Holding reflects some form of horizontal or vertical integration through control of (or partnership with) a supplier, subcontractor, direct competitor etc.
State (domestic)	Public entities (federal, state, and municipal level) of Germany. Corporations are assigned to this category if they are (predominantly) owned by the state including those which act as institutional investors (e.g. sovereign funds).
State (foreign)	Public entities (federal, state, and municipal level) of other countries. Corporations are assigned to this category if they are (predominantly) owned by the state including those which act as institutional investors (e.g. sovereign funds).
Employees	Regular employees of the firm. Includes shareholding trusts or other entities serving employees. Although they are technically speaking employees, this category is not assigned to single members of the management or board (categorized as individuals).
Treasury shares	Previously outstanding shares that are bought back from shareholders by the issuing company.
Miscellaneous	Includes entities which cannot be assigned to any other group, either because it is a type of firm which does not fit into one of the other categories or because it is unclear what kind of entity it is (total lack of information regarding the firm).

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