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Reevaluating the conglomerate discount in Germany: the role of design choices

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Abstract
Despite the current trend toward refocusing on the core business, the empirical results on the conglomerate discount are conflicting and provide opposing implications to managers as to whether they should pursue diversification or not. Prior literature has employed various research designs, all of which have the potential to impact results. In this study, we analyze which design choices affect the conglomerate discount. We analyze a sample of approximately 6000 German firm-years between 2000 and 2019 and find a conglomerate discount of 7.9–11.5%. Our findings reveal that design choices related to self-selection have the highest impact on the results. Using a 2SLS approach, we find no causal relationship between diversification and market value despite testing various sets of instruments and excess values. Our results inform practitioners and researchers regarding the impact of design choices on the magnitude and existence of the conglomerate discount.

Keywords Conglomerate discount · Diversification discount · Diversification · Germany · Strategy · Market value

JEL Classification G32 · L25

1 Introduction

Although diversification of investment portfolios is essential for investors, the business model of (unrelated) industrial diversification seems to become increasingly obsolete. Several large conglomerates have recently split up and refocused on their core businesses. For example, Joe Kaeser, the former CEO of Siemens AG, initiated comprehensive restructuring efforts "to shed dinosaur structure" (McGee 2019). Similar initiatives can be observed at ThyssenKrupp, Metro, and Daimler as well as in U.S. firms such as General Electric, Honeywell, and United Technologies

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Corporation (Gordon and Schotter 2017). This trend is reinforced by investors: Daniel Loeb, a shareholder of Sony, is striving for a spinoff of individual business units for the second time in just six years (Wong 2019).

The current trend toward refocusing on the core business is based on previous research, which finds conglomerates trade at a discount (Berger and Ofek 1995; Denis et al. 2002; Glaser and Müller 2010). This so-called conglomerate or diversification discount seems to be established as a fact to the extent that it is picked up by management textbooks, consulting firms, and activist investors (Bluebell Capital Partners 2023; Boston Consulting Group 2006; Hill and Jones 2004). The economic disadvantages of conglomerates include coordination, compromise, and inflexibility costs due to increased complexity and agency problems that result in cross-subsidization. In addition, conglomerates' accounting data are less transparent and more difficult to evaluate (Bushman et al. 2004; Feldman 2016; Gilson et al. 2001). CEOs often refer to these arguments when they justify their intention to "erase a so-called conglomerate discount" (Miller 2020) by conducting spinoffs. It is worth noting that previous literature found varied estimates of the conglomerate discount, ranging from 1 to 34%, even within the same country (see Appendix 1).

Nevertheless, there are also arguments that suggest no value difference or even a conglomerate premium. Advocates of diversification state that conglomerates benefit from internal capital markets, economies of scope, a reduction in a firm's risk and effective tax rate, and an increase in debt capacity (Lewellen 1971; Stein 1997; Stulz 1990; Weston 1970). In this context, some studies have shown that the diversification decision is endogenous and that the conglomerate discount decreases, disappears, and sometimes becomes a premium when accounting for endogeneity (Ammann et al. 2012).

These conflicting results provide opposing implications for managers as to whether they should pursue diversification or not. Even if there is a conglomerate discount, the magnitude of the conglomerate discount informs managers about the costs of diversification. General economic theory suggests that managers may decide to diversify despite a conglomerate discount if they expect the benefits to outweigh the costs. Thus, understanding the existence and magnitude of the conglomerate discount is of interest to practitioners.

In this context, most studies analyze U.S. data, often rendering evidence from other institutional settings outdated. This also applies to the German market. Although Germany is among the largest economies in the world, prior literature within the German setting is sparse and marked by inconclusive findings. The most recent study by Glaser and Müller (2010) was published about 15 years ago, raising concerns about the relevance and applicability of their findings for practitioners. Lee et al. (2008) show that the valuation of conglomerates is time-variant because country-specific factors affecting the conglomerate discount vary over time as well. Thus, analyzing the German market updates and enriches our knowledge about this relatively underexplored market. Furthermore, most studies analyzing biases in the measurement of excess values and accounting for self-selection rely on U.S. samples. By examining the German market, we can explore these aspects within a different institutional setting, providing an overview of research design choices and insights into the generalizability of prior findings.

Our objective is to contribute insights into the implications of design choices by analyzing the following two research questions:

RQ$_1$: Is there a conglomerate discount within the German capital market?
RQ$_2$: Which design choices affect the conglomerate discount within the German capital market?

We analyze a sample of approximately 6000 German firm-years between 2000 and 2019. Our initial results suggest that diversification is associated with an 11.5% lower market value. However, the conglomerate discount decreases to 7.9–11.4% if we account for certain valuation issues indicating that studies that solely employ traditional excess values likely overstate the conglomerate discount. Furthermore, we find notable variation in estimates of the conglomerate discount over time (− 23.1 to 5.4%) and across industries (− 67.5 to 37.8%). Compared to U.S. samples, the availability of benchmark firms for calculating excess values is often limited in other institutional settings. To explore the impact of the selection of benchmark firms, we expanded our sample by incorporating STOXX Europe 600 firms and find the conglomerate discount to increase by 3.3–4.6% points. We also employ a measure proposed by Boguth et al. (2022), which estimates conglomerate values using conglomerates instead of focused firms. Interestingly, this alternative approach did not identify any conglomerate discount. Consequently, the selection of benchmark firms can affect both the presence and extent of the conglomerate discount.

Finally, we focus on design choices related to the omitted variable and self-selection biases. Our results show that even the inclusion of lagged control variables and firm fixed effects, which do not require the collection of additional information, reduce the conglomerate discount by 2–5.1% points and cause it to become insignificant in one of three specifications. This raises questions about the accuracy of previous estimates of the conglomerate discount in Germany, which rarely control for firm fixed effects. Finally, we employ a 2SLS approach to account for self-selection bias and find the conglomerate discount disappears in each specification despite testing various sets of instruments and excess values. This design choice appears to have the highest impact on the conglomerate discount as it suggests that the firm's decision to diversify is driven by exogenous changes in the firm's environment, which subsequently impact firm values. Consequently, the correlation between diversification and market value (i.e., the conglomerate discount) is not causal.

Our results inform practitioners about the conglomerate discount in Germany. Most importantly, we identify a conglomerate discount that is sensitive to design choices. However, the valuation difference between conglomerates and focused firms is not caused by their diversification activities but reflects the negative relationship between the factors that lead firms to diversify and market valuation. These results contrast common knowledge on the conglomerate discount and proposals made by investors seeking to push companies to refocus. Moreover, we demonstrate which design choices affect the magnitude and existence of the conglomerate discount helping further research to understand the impact of design choices on their findings. In particular, accounting for self-selection has the highest impact on the conglomerate discount.

2 Literature review

Although the association between diversification and market valuation has been analyzed in numerous studies, "the costs and benefits of corporate diversification and its overall effect on the valuation of multi-segment firms still remain a controversial issue" (Sturm and Nüesch 2019, p. 251). The bibliometric study of Schäffer et al. (2011) highlights corporate diversification and internal capital markets as major research areas in the top four finance journals. According to this literature, the conglomerate discount or premium refers to the valuation difference between a conglomerate and its imputed value if each of its segments would operate as a separate firm. While firms are unable to observe this valuation difference, practitioners (e.g., CEOs, journalists, educators, investors, or consulting firms) often refer to the conglomerate discount (Gordon and Schotter 2017; McGee 2019; Wong 2019).

From a theoretical perspective, arguments exist both in favor of a conglomerate discount and in favor of a conglomerate premium. These arguments include direct effects on a firm's market valuation, but also operating performance effects that influence a firm's market valuation indirectly. Accordingly, there are focused firms and conglomerates, and some firms decide to refocus, while others pursue diversification strategies.

2.1 Conglomerate premium

Advocates of diversification state that conglomerates exhibit lower firm risk because they combine segments with imperfectly correlated earnings streams. Founders or founding families in particular benefit from this firm's risk reduction because they typically possess a relatively undiversified personal portfolio (Anderson and Reeb 2003). In addition, diversification reduces the default probability, thereby increasing the market value of debt (Ammann et al. 2012). This coinsurance effect increases the firms' debt capacity and creates value through two channels. First, it enables conglomerates to increase leverage and hence the interest tax shield. Second, the increased debt capacity enables conglomerates to make more investments than comparable focused firms (Berger and Ofek 1995; Lewellen 1971).

Furthermore, conglomerates can not only make more investments but also allocate capital more efficiently within firms. This is due to the creation of internal capital markets ("bright side of capital") that enable segments with high cash flow and poor investment opportunities to finance segments with less cash flow but better investment opportunities ("winner picking"). Consequently, conglomerates can make more value-increasing investments than their individual segments would be capable of making independently (Stein 1997; Stulz 1990; Weston 1970). Moreover, internal markets also allow for more efficient allocation of other resources, including human capital (Lang and Stulz 1994).

Finally, conglomerates are considered more efficient due to synergies and economies of scope. By exploiting firm-specific assets across segments,

conglomerates can become more efficient and more profitable than focused firms (Berger and Ofek 1995; Chandler 1977; Weston 1970).

2.2 Conglomerate discount

There are also several arguments that suggest conglomerates trade at a discount. Although economies of scope are expected to increase efficiency, they entail costs that may reduce or even reverse the benefits of synergies.

Opponents of diversification also emphasize the dark side of internal capital markets, which describes their inherent inefficiencies. Within internal capital markets, divisional managers can exert influence to increase assets under their control. This practice can result in the subsidization of less profitable segments at the expense of more profitable ones (Rajan et al. 2000; Scharfstein and Stein 2000; Stulz 1990). Moreover, agency problems and managers' rent-seeking tendencies can not only lead to inefficient cross-subsidization but also induce firms to retain or pursue a value-decreasing diversification strategy. Managers derive private benefits from diversification, as diversification increases the value of their relatively undiversified personal portfolio (Jensen and Murphy 1990), causes them to be indispensable to the firm (Shleifer and Vishny 1989), and allows them to exploit the firm for their own purposes (Jensen 1986; Purkayastha et al. 2022; Stulz 1990). Moreover, managing a larger firm is associated with more power, prestige, and compensation (Jensen 1986; Jensen and Murphy 1990; Stulz 1990).

Another explanation for a conglomerate discount is based on different assessments made by investors and analysts compared to focused firms. Given that conglomerates' accounting data are less transparent, they are more difficult to evaluate, impairing the accuracy of analysts' forecasts (Bushman et al. 2004; Feldman 2016; Gilson et al. 2001).

2.3 Prior empirical findings for Germany

Although Germany is among the largest economies in the world, most studies on the conglomerate discount rely on U.S. samples. Prior literature on the conglomerate discount in Germany is sparse, marked by inconclusive findings, and potentially outdated.[1] As institutional differences across countries are found to affect the conglomerate discount (e.g., Fauver et al. 2003; Lee et al. 2008; Lins and Servaes 1999; Rudolph and Schwetzler 2013; Weiner 2005), prior evidence from the U.S. is not necessarily applicable to the German market.

The earliest empirical study examining the effect of diversification on firm value in Germany comes from Lins and Servaes (1999). The authors analyze a sample of firms from Germany, Japan, and the UK between 1992 and 1994. While they observe an average discount of approximately 10% in Japan and approximately 15% in the UK, no significant valuation difference can be identified for German firms.

[1] Appendix 1 provides an overview of the empirical findings for Germany.

The working paper by Schwetzler and Reimund (2003) confirms that German conglomerates are not discounted. They examine German firms between 1998 and 2001 and find insignificant effects of diversification on market valuation. However, they argue that prior research did not adequately account for cash holdings and find weak evidence of a conglomerate discount using an adjusted measure of market value.

Fauver et al. (2003) analyze 35 countries, including Germany, during the period from 1991 to 1995. Their results suggest that both the degree of development of the capital markets and the legal and regulatory environment affect the valuation of conglomerates. While Fauver et al. (2003) find evidence for a conglomerate discount, which varies across countries, in the case of German firms, this discount transformed into a premium of 2–10.7%.

Although these results diverge from U.S.-based studies (Berger and Ofek 1995; Mansi and Reeb 2002; Sturm and Nüesch 2019), the conglomerate discount remained relatively underexplored in the subsequent years. Univariate results in the discussion paper by Weiner (2005) suggest that German conglomerates are traded at a discount of approximately 3–10% and Beckmann (2006) finds a conglomerate discount, which increases with the number of unrelated segments.

The most recent paper on the conglomerate discount in Germany is the study by Glaser and Müller (2010). Building on the work of Mansi and Reeb (2002) and using a sample of 4070 firm-years between 2000 and 2006, they analyze whether the conglomerate discount is caused by the book value bias of debt. The valuation differences between focused and diversified firms are usually analyzed by using excess values (Berger and Ofek 1995). However, these excess values rely on the book value of debt, which does not capture the enhanced bondholder value resulting from risk reduction. In their initial analysis, they document a conglomerate discount, which ranges from 7.7 to 13.9%. This discount decreases once the market value of debt is employed instead of the book value of debt and ranges from 6.7 to 8.2%.

To our knowledge, only two dissertations have analyzed the conglomerate discounts since the publication of the study by Glaser and Müller (2010). While Kluge (2014) identifies a conglomerate discount in the period from 2004 to 2010, Liu's (2016) results indicate a conglomerate premium during the period from 2005 to 2014.[2]

3 Methodology and empirical analysis

3.1 Sample selection

Our sample consists of listed German firms between 2000 and 2019. We obtained data from Datastream. The sample period starts in 2000, as German firms have been required to disclose reliable business segment data starting in 2000. We do not

[2] Additionally, there are cross-regional studies on the conglomerate discount that also analyze German conglomerates (e.g., Khan et al. 2021; Rudolph and Schwetzler 2013). We did not discuss these studies as they did not present results for the German subsample.

consider years after 2019 due to the impact of the COVID-19 pandemic. Our initial sample consists of 13,207 firm-years among 1180 unique firms.

Following prior research, we exclude 2928 firm-years from the financial sector (i.e., SIC 6000–6999), as our valuation method requires variables that are often not reported by financial firms. Missing financial data that are necessary to calculate control variables restrict our sample to 9935 firm-years among 894 firms (Panel A). We use three different proxies for market valuation that require additional financial data and are subject to further exclusion criteria as described in Sect. 3.3 (*EV_Sales*, *EV_Merton*, and *EV_Goodwill*). Thus, our final sample ranges from 4455 to 5630 firm-years depending on the measure of market value.

3.2 Measuring diversification

Various approaches can be employed to operationalize conglomerates and the degree of diversification. Prior literature on diversification usually utilizes a binary variable that takes a value of 1 when the firm is a conglomerate and 0 when the firm is focused (Campa and Kedia 2002; Chang et al. 2016; Mansi and Reeb 2002). We follow Glaser and Müller (2010) and classify firms as focused that have (1) only one operating segment or (2) more than one operating segment but all operate in the same two-digit SIC industry or (3) no business segment information was published. Firms are categorized as (3) if there is no information available on segment assets or segment sales or no specific segment descriptions in the database. Segments are treated as nonoperating segments if the segment description contains strings that indicate that the segment is nonoperating (i.e., holding, central division, or corporate), the segment SIC is 9999 (nonclassifiable establishment), or segment assets or sales are negative or zero because such segments can be regarded as adjustment segments. Thus, our measure of diversification indicates whether a firm is unrelated diversified or not.

3.3 Measuring market value

We employ different types of excess values as proxies for market valuation. A firm's excess value is calculated as the natural logarithm of the ratio of a firm's actual value to its imputed value. A positive excess value suggests that the firm trades at a premium (i.e., the conglomerate's actual value is higher than its imputed value if each of its segments operated as a single-firm segment), while a negative excess value implies that the firm trades at a discount (i.e., the conglomerate's actual value is lower than its imputed value).

Our primary measure of market value, *EV_Sales*, is the traditional Berger and Ofek (1995) excess value. The firm's actual value is the sum of the market value of equity and the book value of debt. We calculate the imputed value based on sales multiples, where the imputed value is the sum of the imputed values of its segments; each segment's imputed value is equal to the segment's sales multiplied by its industry median ratio of total capital to sales of focused firms. The industry median ratios are based on a 2-digit SIC grouping that includes at least five focused firms. Excess

values are also calculated for focused firms. By construction, the median excess value of focused firms is zero. For some firms, the sum of segments' sales and the firm's sales differ. Following prior research, we exclude conglomerates whose segment sales deviate by more than 5% (Ammann et al. 2012; Hoechle et al. 2012). The segment sales are adjusted up or down if the deviation is less than 5%. Finally, we exclude extreme values, i.e., actual values that are either more than four times the imputed value (> 1.386) or less than one-fourth of the imputed value (< -1.386).

Additionally, we calculate *EV_Merton* and *EV_Goodwill* to account for two common biases in the diversification discount literature. Glaser and Müller (2010) show that measures of firm values based on book values of debt systematically undervalue conglomerates. Consistent with Eberhart's (2005) application of the Merton (1974) model, we calculate the market value of debt to account for the fact that diversification enhances bondholder value due to a reduction in firm risk. Furthermore, Custódio (2014) argues that assets are typically reported at their transaction-implied value which often exceeds the target's pre-merger book value resulting in lower market-to-book ratios. To mitigate this measurement bias, we subtract goodwill from the book value of assets in measuring the firm value.[3]

3.4 Empirical model

To investigate the association between diversification and market value, we replicate the empirical design in Glaser and Müller (2010):

$$\begin{aligned}\text{MARKET VALUE} = {} & \beta_0 + \beta_1 \,\text{diversified firm (dummy)} + \beta_2 \ln(\text{total assets}) \\ & + \beta_3 \text{operating\_income/total assets} \; + \beta_4 \text{capital expenditures/total assets} \\ & + \beta_5 \text{accounting standards}\end{aligned}$$

We employ measures of excess value based on Berger and Ofek (1995) (*EV_Sales)*, Glaser and Müller (2010) (*EV_Merton)*, and Custódio (2014) (*EV_Goodwill)* as proxies for firms' market value. *diversified firm (dummy)* is a binary variable that takes a value of 1 when the firm is diversified and zero when the firm is focused. Consistent with Glaser and Müller (2010), we control for firm size, profitability, capital expenditures, and accounting standards.[4] Appendix 2 provides the definitions of all variables along with their Datastream identifier.

Because our sample includes heterogeneous firms, which differ in size and thus cause heteroskedasticity, we use robust standard errors. We also employ year fixed effects to control for time effects influencing the diversification discount, which have been documented in prior literature (Berger and Ofek 1995; Chang et al. 2016;

[3] In addition to these measures, other adjustments to the excess value have been discussed in the literature (see e.g., Altieri and Nicodano 2022) to remove other types of bias. However, in the context of this study, we focused only on the most commonly employed measures.

[4] Consistent with Glaser and Müller (2010), we include accounting standard fixed effects. However, our results are similar when we split the sample by accounting standards.

Table 1 Descriptive statistics

Variable	Mean	SD	25pct	75pct	Conglomerates (1)	Focused firms (2)	Difference (1)–(2)
EV_Sales	− 0.104	0.656	− 0.605	0.372	− 0.171	− 0.052	− 0.119***
EV_Merton	− 0.060	0.636	− 0.533	0.397	− 0.095	− 0.030	− 0.065***
EV_Goodwill	− 0.103	0.662	− 0.601	0.389	− 0.173	− 0.048	− 0.125***
Diversified firm (dummy)	0.474	0.499	0.000	1.000	1.000	0.000	
ln(total assets)	11.825	2.506	10.298	13.228	12.785	10.952	1.833***
Operating income/ total assets	− 0.023	0.226	− 0.042	0.078	0.011	− 0.054	0.065***
Capital expenditures/total assets	0.047	0.005	0.015	0.060	0.044	0.049	− 0.005***

This table presents descriptive statistics for the variables used in our regressions. We divide the sample into two groups: (1) conglomerates and (2) focused firms. Detailed variable definitions are available in Appendix 2. *, **, and *** denote significance level of 0.1, 0.05, 0.01, respectively, for the results of *t*-test of means

Denis et al. 2002). We do not employ industry fixed effects because excess values reflect a firm's value relative to the median in an industry and are thus almost analogous to an industry fixed effects estimator (Campa and Kedia 2002).[5]

4 Results

4.1 Descriptive statistics

Table 1 provides descriptive statistics and univariate results for our sample. The means of *EV_Sales*, *EV_Merton*, and *EV_Goodwill* are − 0.104, − 0.060, and − 0.103, respectively. Consistent with the existence of a conglomerate discount, t-tests of means suggest that conglomerates have a lower *EV_Sales* (difference = − 0.119, $p < 0.01$), *EV_Merton* (difference = − 0.065, $p < 0.01$), and *EV_Goodwill* (difference = − 0.125, $p < 0.01$). Furthermore, univariate results suggest that conglomerates hold more assets, generate more operating income, and have fewer capital expenditures.

Table 2 presents correlations between the variables in our models. We find significant negative Spearman and Pearson correlations between *diversified* and market value (*EV_Sales, EV_Merton*, and *EV_Goodwill*) that could indicate the existence of a conglomerate discount. In addition, we find significant correlations between explanatory variables. As these correlations are low and mean variance inflation factors range from 2.15 to 2.18, multicollinearity is not a problem in our models.

[5] We note that our results are robust to the inclusion of industry fixed effects.

Table 2 Correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) EV_Sales	1.000	0.965***	0.960***	− 0.057***	0.063***	0.207***	− 0.022
(2) EV_Merton	0.964***	1.000	0.923***	− 0.057***	0.038**	0.187***	− 0.040***
(3) EV_Goodwill	0.960***	0.922***	1.000	− 0.052***	0.028*	0.186***	0.011
(4) Diversified firm (dummy)	− 0.053***	− 0.054***	− 0.051***	1.000	0.197***	0.021	0.057***
(5) ln(total assets)	0.055***	0.028*	0.016	0.237***	1.000	0.310***	0.189***
(6) Operating income/total assets	0.109***	0.085***	0.085***	0.056***	0.322***	1.000	0.114***
(7) Capital expenditures/total assets	0.014	− 0.001	0.048***	0.020	0.042***	0.012	1.000

This table presents Pearson (bottom half) and Spearman (top half) correlations between the variables used in our regression analyses. Detailed variable definitions are available in Appendix 2. *, **, and *** denote significance level of 0.1, 0.05, 0.01, respectively

Table 3 Results of diversification and market value

	EV_Sales	EV_Merton	EV_Goodwill
Diversified firm (dummy)	− 0.115***	− 0.079***	− 0.114***
	(− 6.536)	(− 4.106)	(− 6.282)
ln(total assets)	− 0.007*	− 0.002	− 0.020***
	(− 1.670)	(− 0.445)	(− 4.432)
Operating income/total assets	0.306***	0.344***	0.294***
	(5.043)	(4.796)	(4.833)
Capital expenditures/total assets	0.337*	0.577***	0.474**
	(1.653)	(2.702)	(2.305)
Constant	0.266***	0.137	0.444***
	(3.346)	(1.421)	(5.540)
Year fixed effects	Yes	Yes	Yes
Accounting standard fixed effects	Yes	Yes	Yes
Observations	5630	4455	5469
Adj. R-squared	0.056	0.049	0.053

This table presents ordinary least squares regressions of market value on diversification. Detailed variable definitions are available in Appendix 2. t-statistics are reported under each coefficient in parentheses. *, **, and *** denote significance level of 0.1, 0.05, 0.01, respectively

Although t-tests of means and correlations indicate that conglomerates are on average traded at a discount, we find 37.21% of the conglomerates in our sample to have an average sales-based excess value above zero (i.e., to be traded at a premium).[6] One potential reason is that the benefits and costs of diversification can differ among firms (Bushman et al. 2004; Glaser et al. 2013). Consistent with this argument, we find that conglomerates traded at a premium are more likely to benefit from increased debt capacity by having higher leverage (difference = 0.016, $p < 0.01$). While conglomerates are expected to benefit from better investment opportunities through the creation of internal capital markets, the inability to increase leverage may inhibit the exploitation of these opportunities. Accordingly, conglomerates traded at a premium invest more in R&D relative to sales (difference = 0.027, $p < 0.01$) and have higher capital expenditures relative to sales (difference = 0.017, $p < 0.01$). We also find that conglomerates traded at a premium are more efficient (e.g., due to synergies and economies of scope), as evident in higher performance in terms of EBIT to sales (difference = 0.024, $p = 0.068$), return on assets (difference = 0.042, $p < 0.01$), growth of sales (difference = 0.081, $p < 0.01$), and growth of assets (difference = 0.069, $p < 0.01$).[7]

[6] In an Online Appendix, we present average sales-based excess values of conglomerates for which we have data on excess values for at least 15 years.

[7] As our research design does not allow us to analyze whether the mentioned differences are caused by diversification, we caution readers that valuation differences could also be a result of factors unrelated to diversification. For example, we find conglomerates traded at a premium to hold more assets (difference = 0.180, $p = 0.040$), be more likely to pay dividends (difference = 0.046, $p = 0.019$), and generate a higher proportion of sales in foreign countries (difference = 0.040, $p < 0.01$).

4.2 Empirical results

Table 3 presents ordinary least squares regressions of diversification on market value. In line with prior research, we find conglomerates to be valuated at a discount (Berger and Ofek 1995; Glaser and Müller 2010; Sturm and Nüesch 2019). The coefficient on diversification is negative and significant at the 1% level in each regression. In particular, there is a discount of 11.5% in model (1). Consistent with prior evidence from the U.S. (e.g., Custódio 2014), the conglomerate discount decreases to a range of 7.9% and 11.4% when we account for debt value and goodwill measurement biases. This finding underscores the importance of accounting for measurement biases when calculating excess values, because neglecting these biases likely leads to an overestimation of the conglomerate discount.[8] The direction of all other associations with our control variables is consistent with prior literature.[9]

Our results contradict the findings of two studies on the German market. While Lins and Servaes (1999) identify no effect of diversification on market valuation in 1992 and 1994, Fauver et al. (2003) find evidence for a conglomerate premium between 1991 and 1995. On the one hand, German firms have been required to disclose segment information comparable to U.S. accounting rules since 2000. Consequently, differences between Germany and the U.S. before 2000 may be attributed to different accounting standards. On the other hand, the valuation of conglomerates in Germany may have become similar to the valuation of conglomerates in the U.S. due to globalization and the increasing activities of foreign investors.

To gain more insights into the conglomerate discount, we estimate the effect of diversification on market value for each year separately. Figure 1 presents coefficients and confidence intervals from those regressions. The coefficients on diversification are mostly negative and vary from − 23.1 to + 5.4% depending on the year and the measure of market value. This broad range of estimates may explain ambiguous results in prior literature. Lee et al. (2008) argue that the valuation of conglomerates is affected by a country's institutional setting which changes over time and can cause studies on the conglomerate discount to find different results when analyzing different sample periods. Moreover, the differences among measures evident

[8] As a robustness test, we also calculate excess values based on asset multipliers and find similar results. Our untabulated results suggest a conglomerate discount of 7.3–11.0% ($p < 0.01$, respectively). Furthermore, we analyze differences in the degree of diversification. We find that 57.87% of the conglomerates in our sample operate in two different industries, 28.76% operate in three industries, 9.09% operate in four industries, and 4.28% operate in more than four industries. In untabulated results, we employ the number of operating segments as a proxy for the degree of diversification and find similar effects on excess values. Specifically, one additional operating segment decreases the firm's market value by 5.2–7.1% ($p < 0.01$, respectively). We also calculate Herfindahl indices to capture the concentration of sales and assets among the firm's segments and continue to find that diversification (i.e., less concentration of assets or sales) significantly reduces excess values.

[9] We also analyze changes in the diversification status and find neither changes from focused to diversified nor changes from diversified to focused have a significant effect on excess values. However, we caution readers that only a small proportion of our sample firms (i.e., 783 firm-years) have changed their diversification status.

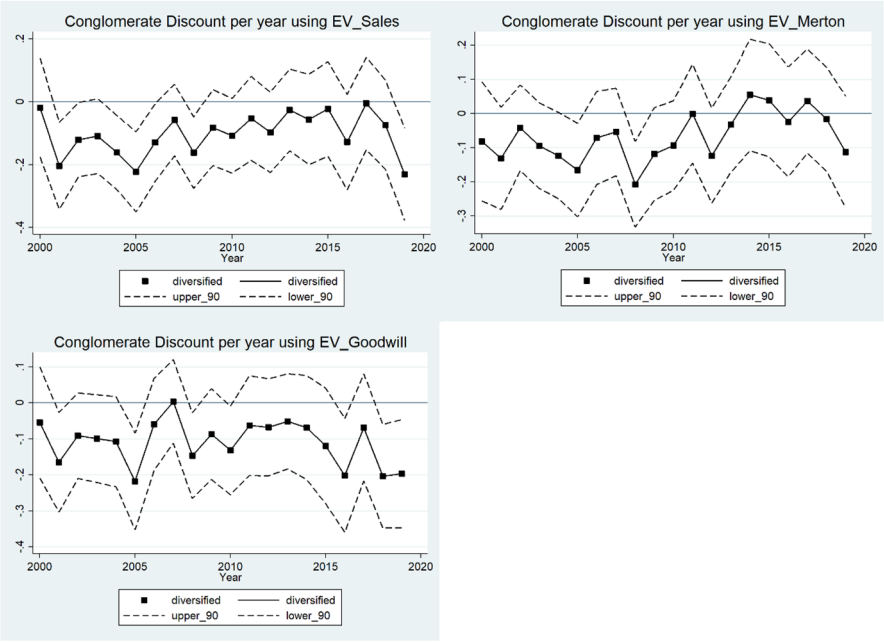

Fig. 1 Conglomerate Discount per Year. This figure presents estimates of the effect of diversification on market value (using *EV_Sales*, *EV_Merton*, and *EV_Goodwill*) for each year separately

across the sample period call research designs into question that solely rely on one measure of market value.

Volkov and Smith (2015) and Garrido-Prada et al. (2019) argue that globally diversified firms benefit from easier access to external capital and a more efficient allocation of capital during periods of increased financial constraints. Contrarily, industrially diversified firms are as negatively affected by local recessions as focused firms. Consistent with these studies, we continue to observe a conglomerate discount during the financial crisis 2008. Our results in Fig. 1 further indicate that changes in segment reporting resulting from the mandatory adoption of IFRS 8 in 2009 have not affected the valuation of conglomerates.[10] Interestingly, our analysis reveals mostly insignificant effects of diversification after 2014 and partly positive coefficients on diversification when *EV_Merton* is the dependent variable. This is of particular interest because we are not aware of any study that examines the conglomerate discount in Germany after 2014.

Finally, we analyze whether the conglomerate discount varies across industries. Table 4 presents ordinary least squares coefficients on diversification for each two-digit SIC industry. Note that we do not tabulate industries with less than 100 observations in any of the three regressions. Consistent with Erdorf et al. (2013)

[10] In untabulated results, we calculate a binary variable for years after IFRS 8 adoption and find no significant interaction between this variable and the diversification dummy.

Table 4 Conglomerate discount per industry

Industry	SIC-Code	Firm-years	pct. of conglomerate firm-years (%)	EV_Sales	EV_Merton	EV_Goodwill
Food and Kindred Products	20	111–137	57.76	− 0.260***	− 0.258***	− 0.278***
Chemicals and Allied Industries	28	281–367	53.33	0.158*	0.138	0.157*
Industrial Machinery and Equipment	35	621–731	56.50	− 0.141***	− 0.102**	− 0.148***
Electronic and Other Electric Equipment	36	485–607	36.82	− 0.032	− 0.011	− 0.018
Transportation Equipment	37	151–185	59.06	− 0.263***	− 0.183**	− 0.261***
Measuring, Analyzing, and Controlling Instruments; Photographic, Medical and Optical Goods; Watches and Clocks	38	229–253	51.82	− 0.063	− 0.057	− 0.052
Postal Service, Couriers and Messengers, Warehousing and Storage	49	113–203	55.48	− 0.055	0.194	− 0.027
Miscellaneous Retail	59	100–120	52.27	− 0.578***	− 0.563***	− 0.675***
Business Services	73	916–1300	37.51	− 0.091**	− 0.092**	− 0.120***
Motion Pictures	78	125–143	47.48	0.252**	0.257*	0.378***
Health Services	80	107–142	44.05	0.056	0.178	− 0.086
Engineering, Accounting, Research, Management, and Related Services	87	160–181	23.57	− 0.052	− 0.027	0.039

This table presents ordinary least squares regressions of market value on diversification per 2-digit SIC. We only display industries where the regressions include at least 100 firm-years. Detailed variable definitions are available in Appendix 2. *, **, and *** denote significance level of 0.1, 0.05, 0.01, respectively

and Santalo and Becerra (2008), our results suggest that the valuation of conglomerates varies across industries. In particular, we find negative and significant coefficients on diversification across all three specifications for SIC codes 20, 35, 37, 59, and 73. However, we also identify industries where conglomerates are not traded at a discount (SIC codes 36, 38, 49, 80, and 87). Conglomerates operating in these industries are expected to suffer less from the disadvantages of diversification. Interestingly, we find firms operating in the motion pictures industry (SIC code 78) to be more likely to realize the advantages of diversification. We find positive and significant coefficients across all three specifications for firms operating in this industry indicating a conglomerate premium of 25.2–37.8%.

The heterogeneity of conglomerate valuations across industries is of particular interest in small industries. As the traditional excess value measure of Berger and Ofek (1995) requires at least 5 focused firms in each industry, the consideration of conglomerates depends on the sample selection process and the availability of data in the respective database. For example, we find 4 industries that fall just below this threshold (i.e., industries with 4 focused firms) resulting in missing excess values for 101 conglomerates that report segments operating in these industries.

4.3 Selection of benchmark firms

As excess values impute the conglomerate value based on multiples from focused firms operating within the same industry, the selection of appropriate benchmark firms is important. However, studies outside the U.S. are often limited in the availability of comparable benchmark firms especially for the largest conglomerates. To explore the impact of the selection of benchmark firms, we add data from large European firms to our sample and re-estimate excess values. Specifically, we add STOXX Europe 600 firms and analyze both the effect of diversification on market value within a European sample and the effect within the German subsample that considers European focused firms for the calculation of excess values.

Table 5 presents ordinary least squares regressions of diversification on market value within this enlarged sample. We continue to find a conglomerate discount in the European sample ranging from 16.3 to 20.4%, indicating that the restriction to German firms may have underestimated the conglomerate discount by 8.4 to 8.9% points. The conglomerate discount changes from 11.2 to 16.1% when we restrict our sample to German firms but keep European firms as benchmark firms indicating a difference of 3.3 to 4.6% points compared to our main models.

Though these results may indicate that the limited availability of comparable focused firms affects our results, the inclusion of firms from other institutional settings may also bias regression outcomes, because country-specific differences are found to affect the valuation of conglomerates (Fauver et al. 2003; Lee et al. 2008; Lins and Servaes 1999; Rudolph and Schwetzler 2013; Weiner 2005). Regardless of the source of these differences, the results emphasize that the selection of benchmark firms, particularly for studies outside the U.S., has an impact on the results.

Another bias induced by the selection of benchmark firms has been explored by Boguth et al. (2022). They argue that measurement errors may arise due to

Table 5 Selection of benchmark firms

	European sample			German sample		
	EV_Sales	EV_Merton	EV_Goodwill	EV_Sales	EV_Merton	EV_Goodwill
Diversified firm (dummy)	− 0.186***	− 0.163***	− 0.204***	− 0.138***	− 0.112***	− 0.161***
	(− 13.897)	(− 10.645)	(− 14.598)	(− 8.147)	(− 5.873)	(− 9.176)
ln(total assets)	0.014***	0.023***	0.003	− 0.023***	− 0.016***	− 0.035***
	(5.230)	(6.647)	(0.943)	(− 6.042)	(− 3.289)	(− 8.697)
Operating income/total assets	0.587***	0.587***	0.637***	0.393***	0.402***	0.414***
	(9.938)	(7.979)	(10.477)	(6.338)	(5.233)	(6.567)
Capital expenditures/total assets	− 0.006	0.107	0.301*	0.244	0.496**	0.373*
	(− 0.039)	(0.603)	(1.777)	(1.146)	(2.233)	(1.745)
Constant	− 0.011	− 0.147**	0.128**	0.424***	0.281***	0.529***
	(− 0.176)	(− 2.004)	(2.063)	(5.360)	(3.006)	(6.560)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Accounting standard fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	9687	7204	9380	5946	4700	5796
Adj. R-squared	0.080	0.084	0.076	0.068	0.066	0.075

This table presents ordinary least squares regressions of market value on diversification. The first three models report results on the European sample (i.e., including STOXX 600 Europe firms) and models 4 to 6 analyze a sample of German firms that considers European focused firms for the calculation of excess values. Detailed variable definitions are available in Appendix 2. t-statistics are reported under each coefficient in parentheses. *, **, and *** denote significance level of 0.1, 0.05, 0.01, respectively

differences between conglomerates and focused firms and propose estimating valuation multiples of conglomerates based on cross-sectional quantile regressions of conglomerates' value on their sales exposure to 10 Fama French industries. Using this measure, we find the conglomerate discount to become insignificant raising concerns about whether focused firms are appropriate benchmark firms for the calculation of excess values.

4.4 Endogeneity

Several studies have shown that the decision to diversify is endogenous, resulting in biased estimates of the conglomerate discount. However, prior literature from the U.S. provides mixed evidence on the endogeneity-adjusted conglomerate discount, ranging from studies that find a decrease in the conglomerate discount to studies that find no conglomerate discount or even a premium (Ammann et al. 2012; Chang et al. 2016; Hoechle et al. 2012; Villalonga 2004). The diversity in results may be attributed to both the type of endogeneity addressed and the employed methods.

We begin to analyze the impact of endogeneity by focusing on the omission of relevant factors. To the extent that omitted variables are correlated with both the diversification decision and market valuation, our estimates of the conglomerate discount are biased. In Table 6, we show that the conglomerate discount is affected by the selection of control variables. Specifically, we re-estimate our empirical model, including 1- and 2-year lags of our control variables, as suggested by Campa and Kedia (2002). Even though the inclusion of lagged control variables adds little information to the model and requires no additional data, the conglomerate discount decreases to between 6.7 and 10.4%. In other words, we find a reduction of at least 1% point in each specification by adding little information to our research design. We further include firm fixed effects in our empirical model. The inclusion of firm fixed effects also requires no additional information but has higher informative value as it accounts for (unobservable) firm-specific characteristics that remain constant over time. Our results in Table 6 suggest that firm-specific characteristics partially cause the conglomerate discount, as evident by a reduction in the conglomerate discount of 2–5.1% points. Specifically, we find a conglomerate discount of 6.3% (8.5%) when *EV_Sales* (*EV_Goodwill*) is the measure of market valuation and no conglomerate discount when *EV_Merton* is the dependent variable.

In the next step, we account for a potential self-selection bias by estimating instrumental variables regressions. Estimates on differences between conglomerates and focused firms are only unbiased if the diversification status is randomly assigned. However, this assumption is unrealistic in the context of managerial decisions. 2SLS is a possible approach to eliminate this self-selection bias.[11] Following prior research (e.g., Ammann et al. 2012; Campa and Kedia 2002; Villalonga 2004), we analyze four different categories of instruments. First, we include two instruments

[11] Compared to Heckman's self-selection model, 2SLS allows us to utilize test statistics for instrumental variables, such as tests for the strength of instrumental variables and the test for overidentification (Chang et al. 2016).

Table 6 Inclusion of additional control variables

	EV_Sales	EV_Merton	EV_Goodwill	EV_Sales	EV_Merton	EV_Goodwill
Diversified firm (dummy)	− 0.104***	− 0.067***	− 0.103***	− 0.063**	− 0.043	− 0.085***
	(− 5.879)	(− 3.485)	(− 5.600)	(− 2.246)	(− 1.459)	(− 2.899)
ln(total assets)	0.261***	0.287***	0.217***	0.371***	0.340***	0.320***
	(8.011)	(7.422)	(6.502)	(10.070)	(7.659)	(8.289)
Operating income/total assets	0.068	− 0.000	0.085	0.038	0.001	0.062
	(1.018)	(− 0.002)	(1.248)	(0.470)	(0.015)	(0.744)
Capital expenditures/total assets	0.140	0.375*	0.310	0.471*	0.534*	0.487*
	(0.670)	(1.747)	(1.459)	(1.799)	(1.941)	(1.754)
ln(total assets) (1 lag)	− 0.094**	− 0.141***	− 0.061	− 0.155***	− 0.196***	− 0.115***
	(− 2.242)	(− 2.698)	(− 1.410)	(− 4.501)	(− 5.209)	(− 3.495)
Operating income/total assets (1 lag)	0.020	0.079	0.019	0.010	0.123**	0.007
	(1.496)	(0.994)	(1.434)	(0.939)	(2.214)	(0.717)
Capital expenditures/total assets (1 lag)	0.078**	0.059**	0.073**	0.057*	0.053	0.051
	(2.217)	(2.142)	(2.116)	(1.676)	(1.588)	(1.446)
ln(total assets) (2 lag)	− 0.171***	− 0.148***	− 0.173***	− 0.119***	− 0.090***	− 0.119***
	(− 6.442)	(− 4.869)	(− 6.055)	(− 5.068)	(− 3.730)	(− 4.947)
Operating income/total assets (2 lag)	0.029	0.152*	0.028	0.018	0.159**	0.016
	(1.324)	(1.888)	(1.230)	(0.961)	(2.560)	(0.853)
Capital expenditures/total assets (2 lag)	− 0.036**	− 0.024*	− 0.030*	− 0.017	− 0.018	− 0.009
	(− 2.117)	(− 1.937)	(− 1.817)	(− 1.270)	(− 1.338)	(− 0.644)
Constant	0.054	0.003	0.254***	− 1.260***	− 0.786**	− 1.012***
	(0.680)	(0.027)	(3.122)	(− 3.641)	(− 2.035)	(− 2.663)
Firm fixed effects	No	No	No	Yes	Yes	Yes

Table 6 (continued)

	EV_Sales	EV_Merton	EV_Goodwill	EV_Sales	EV_Merton	EV_Goodwill
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Accounting standard fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5630	4455	5469	5630	4455	5469
Adj. R-squared	0.056	0.049	0.053	0.058	0.052	0.057

This table presents ordinary least squares regressions of market value on diversification. Specifically, we include lagged control variables and firm fixed effects to analyze the impact of omitted variable bias in our models. Detailed variable definitions are available in Appendix 2. t-statistics are reported under each coefficient in parentheses. *, **, and *** denote significance level of 0.1, 0.05, 0.01, respectively

capturing the attractiveness of the industry in a given year: the percentage of firms that are conglomerates and the percentage of sales accounted for by conglomerates. Industry-specific factors that affect the likelihood to diversify include, for example, industry regulation, market structure, technology, and business risks. Second, we consider time trends such as the existence of M&A waves by including the number and volume of M&A per industry-year. Third, we account for trends in macroeconomic conditions. As 2SLS estimates the effect of all instruments and control variables on the endogenous variable, we already capture time trends that are constant across firms through year fixed effects. Thus, we include the regional growth in GDP and its lagged value to capture time trends that vary across firms. We use the first-digit postal codes of the firms' headquarters to assign a firm to a specific region and access data on regional GDP from the Federal Statistical Office of Germany. This approach assumes that economic changes within the firm's primary region have the highest impact on the firm. Fourth, we include a binary variable measuring whether firms are listed on a major exchange (i.e., DAX) as these firms are more visible and have higher analyst coverage, which in turn facilitates M&A activities and raising external financing.[12]

Table 7 presents our first-stage results on the determinants of diversification, considering the instruments and the control variables from Table 6. To ensure robustness, we analyze each combination of the four instrument categories separately, resulting in 15 distinct instrument combinations. However, we only tabulate tuples of instrument categories that sufficiently correlate with our diversification measure and do not produce overidentified models. Specifically, we require F statistics for the joint significance of instruments to exceed 10 and perform Wooldridge's robust score test of overidentifying restrictions. These criteria are consistent with existing research and are intended to ensure the accuracy of our results (Lal et al. 2023). We find 4 sets of instruments that are valid and have high explanatory power for the diversification decision.[13] Specifically, our instruments capture industry attractiveness in model (1), industry attractiveness and M&A activities in model (2), industry attractiveness and macroeconomic conditions in model (3), and industry attractiveness, M&A activities, and macroeconomic conditions in model (4). Our results suggest that the fraction of conglomerates and the number of M&A within the industry significantly affect the diversification decision ($p < 0.01$, respectively).

Our second-stage results are presented in Table 8. We analyze the effect of diversification on *EV_Sales*, *EV_Merton*, and *EV_Goodwill* for each set of instruments separately. Our results suggest that the self-selection bias is responsible for the conglomerate discount. Across all 12 regressions, we consistently

[12] The mentioned instruments are valid to the extent that they affect the diversification decision and do not affect excess values, except by making diversification more or less likely. As excess values represent firm values relative to the median firm in the industry, they are, by construction, independent from industry-specific characteristics. Although macroeconomic factors and listing status have been frequently employed as instruments for diversification (Ammann et al. 2012; Campa and Kedia 2002; Villalonga 2004), they appear less independent from a firm's relative valuation.

[13] Partial R-squared values are comparable to other studies in this research field (e.g., Campa and Kedia 2002; Chang et al. 2016), indicating that our instruments are not weak.

Table 7 Determinants of diversification

	(1)	(2)	(3)	(4)
Fraction of conglomerates in industry	0.675***	0.714***	0.654***	0.714***
	(13.528)	(13.860)	(12.450)	(13.185)
Fraction of industry-sales from conglomerates	0.002	− 0.012	0.016	− 0.006
	(0.069)	(− 0.407)	(0.513)	(− 0.182)
Number of M&A in industry		0.001***		0.001***
		(2.812)		(4.197)
Volume of M&A in industry		− 0.000		− 0.000
		(− 0.431)		(− 0.259)
GDP Growth			− 0.384	− 0.437
			(− 0.372)	(− 0.425)
GDP Growth (1 lag)			− 0.877	− 0.955
			(− 0.844)	(− 0.919)
ln(total assets)	0.022	0.021	0.031	0.030
	(1.002)	(0.974)	(1.351)	(1.309)
Operating income/total assets	− 0.011	− 0.004	− 0.001	0.011
	(− 0.264)	(− 0.098)	(− 0.027)	(0.238)
Capital expenditures/total assets	− 0.000	0.053	− 0.081	0.011
	(− 0.002)	(0.337)	(− 0.485)	(0.064)
ln(total assets) (1 lag)	− 0.030	− 0.031	− 0.040	− 0.040
	(− 1.109)	(− 1.131)	(− 1.392)	(− 1.380)
Operating income/total assets (1 lag)	0.000	− 0.001	0.002	0.001
	(0.006)	(− 0.040)	(0.113)	(0.049)
Capital expenditures/total assets (1 lag)	− 0.002	0.001	− 0.002	0.002
	(− 0.108)	(0.029)	(− 0.104)	(0.120)
ln(total assets) (2 lag)	0.051***	0.053***	0.050***	0.052***
	(3.116)	(3.239)	(2.860)	(2.964)
Operating income/total assets (2 lag)	0.003	0.003	0.002	0.002
	(0.313)	(0.270)	(0.195)	(0.135)
Capital expenditures/total assets (2 lag)	− 0.008	− 0.010	− 0.009	− 0.012*
	(− 0.982)	(− 1.240)	(− 1.202)	(− 1.662)
Constant	− 0.414***	− 0.480***	− 0.353***	− 0.451***
	(− 6.749)	(− 7.286)	(− 4.587)	(− 5.576)
Year fixed effects	Yes	Yes	Yes	Yes
Accounting standard fixed effects	Yes	Yes	Yes	Yes
Observations	5346	5346	4746	4746
Wooldridge's test statistic	0.942	0.239	0.291	0.241
F statistics for joint significance of instruments	119.110	62.369	54.533	40.247
Partial R-squared	0.036	0.037	0.036	0.040
Adj. R-squared	0.117	0.118	0.124	0.127

This table presents 2SLS (first-stage) results analyzing the determinants of diversification. Exploratory variables include different sets of instrumental variables, control variables, and lagged control variables. Detailed variable definitions are available in Appendix 2. t-statistics are reported under each coefficient in parentheses. *, **, and *** denote significance level of 0.1, 0.05, 0.01, respectively

Table 8 Instrumental variables regressions

	Second-stage results based on the instruments employed in model (1), Table 6			Second-stage results based on the instruments employed in model (2), Table 6		
	EV_Sales	EV_Merton	EV_Goodwill	EV_Sales	EV_Merton	EV_Goodwill
Diversified firm (dummy)	− 0.092	− 0.058	− 0.138	− 0.112	− 0.039	− 0.126
	(− 0.992)	(− 0.586)	(− 1.444)	(− 1.232)	(− 0.417)	(− 1.354)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Accounting standard fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5346	4254	5192	5346	4254	5192
Adj. R-squared	0.077	0.077	0.070	0.077	0.077	0.070
	Second-stage results based on the instruments employed in model (3), Table 6			Second-stage results based on the instruments employed in model (4), Table 6		
	EV_Sales	EV_Merton	EV_Goodwill	EV_Sales	EV_Merton	EV_Goodwill
Diversified firm (dummy)	− 0.070	− 0.047	− 0.108	− 0.102	− 0.012	− 0.090
	(− 0.719)	(− 0.466)	(− 1.073)	(− 1.103)	(− 0.125)	(− 0.957)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Accounting standard fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4746	3779	4593	4746	3779	4593
Adj. R-squared	0.082	0.086	0.077	0.082	0.085	0.077

This table presents 2SLS (second-stage) results of market value on diversification based on the first-stage results provided in Table 7. Detailed variable definitions are available in Appendix 2. t-statistics are reported under each coefficient in parentheses. *, **, and *** denote significance level of 0.1, 0.05, 0.01, respectively

observe insignificant effects of diversification. Despite the variety of instruments employed in the literature, our results indicate that each set of instruments that meets the requirements for 2SLS is capable of addressing the self-selection bias.

Consistent with prior literature (e.g., Ammann et al. 2012; Chang et al. 2016; Hoechle et al. 2012; Villalonga 2004), our results indicate that firms decide whether to operate as a focused firm or as a conglomerate and the firm's decision to diversify is driven by exogenous changes in the firm's environment, which subsequently impact firm values. Thus, the valuation difference between focused firms and conglomerates cannot be attributed to a causal relationship.

5 Discussion

In contrast to the commonly held belief that conglomerates trade at a discount, our study indicates that the conglomerate discount is sensitive to design choices and challenges the causality of the relationship between diversification and market valuation. Although we primarily intend to update and enrich existing knowledge about the relatively underexplored German market, our results also align with previous research in other countries and are likely to generalize to other institutional settings.

The wide range of estimates of the conglomerate discount, even within studies focused on the same country, makes it difficult to position the magnitude of the discount observed in our study within the existing literature. Nevertheless, our results reveal similar patterns in the conglomerate discount, consistent with prior literature. For example, measurement biases in the calculation of excess values, causing an overestimation of the conglomerate discount, have been documented in the U.S. as well (e.g., Altieri and Nicodano 2022; Boguth et al. 2022; Custódio 2014). Moreover, variations in the conglomerate discount over time and across industries are also likely to generalize to other institutional settings. For example, Santalo and Becerra's (2008) framework provides insights into why industry heterogeneity may moderate the relationship between diversification and market valuation, regardless of the institutional background. Furthermore, Lee et al. (2008) have documented and discussed changes in the conglomerate valuation over time within emerging economies.

Our observation that the most influential design choices are related to endogeneity also correspond to U.S.-based studies. For example, Campa and Kedia (2002) find the conglomerate discount to decrease from a range between 9 and 13% to a range between 4 and 6% after accounting for unobservable firm characteristics that remain constant over time by including firm fixed effects. Notably, we find the conglomerate discount to disappear in one specification, although our sample period consists of 20 years and firm fixed effects therefore account for unobserved firm characteristics that have been constant for two decades. In addition, the fact that the self-selection bias at least partially explains the conglomerate discount aligns with previous research in the U.S. (e.g., Ammann et al. 2012; Hoechle et al. 2012; Villalonga 2004).

While our findings are consistent with research using U.S. data, issues related to the selection of benchmark firms are likely attributed to particularities in the German context. In smaller markets, the availability of comparable focused firms for calculating excess values is limited. Including firms from other institutional settings may mitigate this issue, but could introduce a different type of bias due to country-specific differences. Thus, we are unable to differentiate whether the increase in the conglomerate discount is a result of the relatively small German sample or the inclusion of additional European firms. To the extent that the latter drives our results, they should also be of interest to the U.S. because regional disparities among states can affect U.S.-based results as well.

6 Conclusion

This study examines the association between diversification and market value in Germany. While advocates of diversification state that conglomerates benefit from, for example, internal capital markets, economies of scope, or a reduction in firm risk, several additional costs and agency problems arise due to diversification, which could cause a conglomerate discount. According to the different arguments, we find mixed evidence in previous literature on the existence and magnitude of the conglomerate discount.

We argue that conflicting findings may be attributable to differences in the research design because prior literature differs, among others, regarding the selection of variables, the sample selection process, and the consideration of endogeneity. Specifically, we analyze whether there is a conglomerate discount within the German capital market and which design choices affect the conglomerate discount.

Our initial results suggest that conglomerates trade at a discount of 11.5%. However, the conglomerate discount decreases to 7.9 to 11.4% if we employ excess values addressing specific valuation biases and varies over time (− 23.1 to 5.4%), across industries (− 67.5 to 37.8%), and after considering additional benchmark firms (11.2 to 16.1%). Nevertheless, the most influential design choices appear to be related to the omitted variable and self-selection biases. After including lagged control variables and firm fixed effects, the conglomerate discount decreases by 2–5.1% points and becomes insignificant in one of three specifications. Furthermore, we employ a 2SLS approach to account for self-selection bias and find the conglomerate discount disappears in each specification.

Our study contributes to the literature on the conglomerate discount in Germany as studies within the German market are rare, inconclusive, and potentially outdated. Specifically, we find that firms decide whether to operate as a focused firm or as a conglomerate and the firm's decision to diversify is driven by exogenous changes in the firm's environment, which subsequently impact firm values. Thus, we question efforts by activist investors and managers to refocus. In this context, our analyses of design choices help to understand conflicting results and provide additional evidence on the generalizability of biases in the conglomerate discount literature within a different institutional setting. Specifically, we show that further research should account for self-selection as this design choice questions the causal effect of diversification on market value.

While we believe that our results can inform researchers and practitioners regarding the valuation of conglomerates, we caution readers that our study is subject to limitations. First, our study analyzes whether diversification affects market value on average. However, scholars such as Sturm and Nüesch (2019) identify conditions that moderate the relationship between diversification and market value. Second, we analyze diversification through the number and main industry of reported segments, but segments can operate in multiple industries simultaneously. Moreover, restructuring and reporting decisions can affect the number of reported segments but not necessarily in which industries a firm

operates. Third, sample selection criteria employed in previous literature forced us to exclude several observations and potentially affect the generalizability of our results.

Nevertheless, this study suggests numerous potential new research paths. As the decision to diversify is strategic, combining more strategy-related variables (e.g., competitive strategies) could generate further insights. It would also be interesting to extend the analysis of the diversification discount to accounting-related topics, e.g., the use of aggressive reporting practices. Finally, a more detailed analysis of shareholder reactions to diversification could fill knowledge gaps.

Appendix 1

See Table 9.

Table 9 Empirical studies of the German Capital Market

References	Sample size	Period	Valuation difference	Findings
Lins and Servaes (1999)	401 German firm-years (and 2318 firm-years from firms in Japan and UK)	1992 and 1994	No valuation difference	Lins and Servaes (1999) find no evidence of a conglomerate discount in Germany but a discount of approximately 10% in Japan and 15% in the UK. Moreover, concentrated ownership in the hands of insiders enhances the valuation of diversified firms in Germany but not in Japan or the UK
Schwetzler and Reimund (2003)	1052 German firm-years	1988 to 2001	No valuation difference	Schwetzler and Reimund (2003) find no evidence of a conglomerate discount when they employ Berger and Ofek's (1995) excess value. However, they argue that this measure is biased because it does not reflect cash holdings and develop excess values on an enterprise value basis. Using this variable, they find a weakly significant conglomerate discount of approximately 6%
Fauver et al. (2003)	3398 German firm-years (and 25,410 firm-years from other countries)	1991 to 1995	Conglomerate premium 2–10.7%	Fauver et al. (2003) analyze the association between diversification and market performance in a conglomerate setting and find evidence for a conglomerate discount. However, they also identify country-specific differences that interact significantly with diversification. Their study suggests that conglomerates in Germany are valuated at a premium of between 2% and 10.7%

Table 9 (continued)

References	Sample size	Period	Valuation difference	Findings
Weiner (2005)	6308 German firm-years (and 27,493 firm-years from other countries)	1991 to 2003	Conglomerate discount 3–10%	Univariate results suggest that firms in Germany are traded at a valuation discount of approximately 3–10% on average. The discount increases to between 21 and 23% if one uses comparable firms from a combined German and European sample
Beckmann (2006)	2440 German firm-years	1998 to 2001	Conglomerate discount 17–23%	Univariate results suggest that conglomerates in Germany are traded at a valuation discount of approximately 17–23% on average. In addition, Beckmann (2006) finds consistently negative effects of the number of unrelated segments in a regression analysis, where the conglomerate discount increases with the number of unrelated segments
Glaser and Müller (2010)	4070 German firm-years	2000 to 2006	Conglomerate discount 7.7–13.9%	Glaser and Müller (2010) analyze whether the conglomerate discount is caused by the book value bias of debt. Their results suggest that conglomerates trade at a discount of between 7.7% and 13.9%. However, the diversification discount decreases once the market value of debt is employed instead of the book value of debt and ranges from 6.7 to 8.2%
Kluge (2014)	1638 German firm-years	2004 to 2010	Conglomerate discount 1–34%	Univariate results suggest that firms in Germany are traded at a valuation discount of approximately 1–34% on average. In addition, Kluge (2014) finds a negative and significant effect of the number of unrelated segments on a firm's market value
Liu (2016)	3240 German firm-years	2005 to 2014	Mixed evidence − 5.46 to 7.99%	Liu (2016) finds evidence for both a conglomerate premium and discount depending on the measure of market value. Overall, sales-based excess values produce a conglomerate discount, while asset-based excess values and hybrid excess values indicate a conglomerate discount. Diversification has no effect on liquidity-adjusted excess values. The results are robust to a number of robustness checks including a Heckman two-stage approach

Appendix 2

See Table 10.

Table 10 Variable definitions

Market value	
EV_Sales	is the traditional excess value introduced by Berger and Ofek (1995). The excess value compares a firm's actual value to its imputed value if each of its segments operated as single-segment firms (see Sect. 3.3 for a detailed description): $\text{EV\_Sales} = \ln\left(\frac{\text{actual value}}{\text{imputed value}}\right)$ where actual value = market value of equity (WC08001) + book value of debt (WC03255) imputed value = $\sum$ multiplier × $\text{sales}_{\text{segment}}$ (WC19501 − WC19591) $\text{multiplier}_{\text{sales}}$ = industry median of focused firms$\left(\frac{\text{actual value}}{\text{sales (WC01001)}}\right)$.
EV_Merton	is the excess value based on Glaser and Müller (2010). The authors employ Eberhart's (2005) application of the Merton (1974) model to estimate the market value of debt. Contrary to the traditional excess value, the firm's actual value is the sum of market value of equity and market value of debt, where the firm's market value of debt (V) is calculated by solving the following equations numerically: $E = VN(d_1) - e^{-rT}FN(d_2)$ $d_1 = \frac{\ln\left(\frac{V}{F}\right)+(r+0.5\sigma_V^2)T}{\sigma_V\sqrt{T}}$ $d_2 = d_1 - \sigma_V\sqrt{T}$ $\sigma_E = \frac{V}{E}_1 N(d_1)\sigma_V$ with σ_E = Standard deviation of daily stock returns over the past 125 trading days T = 0.6 × short - term debt ratio (WC03051) + 6.3 × long - term debt ratio (WC03251)r = 1 - year EURIBOR F = Total debt (WC03255) × $(1+i)^T$ $i = \frac{\text{interest expense (WC01251)}}{\text{total interest bearing debt (WC03255)}}$ E = market capitalization (WC08001)
EV_Goodwill	is the excess value based on Custódio (2014). Contrary to the traditional excess value, goodwill (WC02502) is subtracted from the firm's actual value
Control variables	

Table 10 (continued)

Diversified firm (dummy)	is a binary variable that takes a value of 1 when the firm is diversified and zero when the firm is focused (see chapter 3.2 for a detailed description)
Accounting standard (dummy)	consists of three binary variables (WC07536). Each dummy is set to 1 if a specific accounting standard is used and 0 otherwise. Firms are grouped into US-GAAP, local GAAP (HGB), and IFRS
Total assets	WC02999
Capital expenditures	WC04601
Operating income	WC01250
Instrumental variables	
Fraction of conglomerates in industry	is the percentage of conglomerates that are conglomerates in the firm's industry-year
Fraction of industry-sales from conglomerates	is the percentage of sales accounted for by conglomerates in the firm's industry-year
Number of M&A in industry	is the number of M&A announced in the firm's industry-year
Volume of M&A in industry	is the volume of M&A announced in the firm's industry-year
GDP growth	is the growth in GDP of the firm's region, where the region is based on the first-digit postual code of the firm's headquarter
Major Index	is a binary variable indicating whether the firm is listed on a mahor exchange (i.e., DAX) based on WC05661

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Data availability The dataset generated for the current study stems from Datastream and is not publicly available without a user's license. Information on how to obtain it and reproduce the analyses is available from the author on request.

Declarations

Conflict of interest The authors have no relevant financial or non-financial interest to disclose.

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