Conglomerate discount and cash distortion: New evidence from Germany

HHL Working Paper

First version: 01/08/2003
This version:03/31/2003

JEL classifications: G31, G32

Prof. Dr. Bernhard Schwetzler, Dipl.-Kfm. Carsten Reimund
HHL – Leipzig Graduate School of Management
Jahnallee 59
04105 Leipzig
Germany

Comments are welcome and may be sent to
finance@hhl.de

2003

Abstract

Conglomerate discounts or premia are derived by comparing market values of conglomerates with the market values of a matched portfolio of stand alone firms (the imputed value of the conglomerates). Usually this comparison is based on firm values. We show that in this case conglomerate discounts or premia are subject to a potential bias caused by different cash holdings of conglomerates and stand alone firms. We prove evidence of such a cash distortion for German data: as German conglomerates hold on average substantially higher cash positions than the matched portfolio of stand alones, excess firm values are systematically upwards biased. Deducting cash from firm value and calculating discounts or premia based on enterprise values removes the bias. Based on excess enterprise values we are able to show a modest, but statistically significant conglomerate discount in Germany that is about 6% on an enterprise value basis.

1. Introduction

The question whether corporate diversification increases shareholder wealth has puzzled financial researchers since the late 70´s. For most of the countries this question has been empirically answered with negative findings in numerous studies; the first studies that directly linked a diversification measure to changes in value were Lang/Stulz (1994), using Tobins Q as a value measure and Berger/Ofek (1995), who computed conglomerate premia and discounts.

Germany seems to play a special role in empirical research on conglomerate premia or discounts: in contrast to most other countries with developed capital markets, researchers have so far failed to show a significant discount for German data. Lins /Servaes (1999), applying the Berger/Ofek methodology upon German firms from 1992 and 1994, concluded that there is no significant effect of diversification on firm values (whereas there is a significant negative one for Japanese and UK firms). Fauver/Houston/Naranjo (2002) using the same methodology report a (not significant) conglomerate premium for legal systems with German origin and conclude that “the net costs of diversification are the smallest for firms that operate under the German legal system” (p. 14).

This paper is contributing to the conglomerate premium/discount discussion in two ways: Firstly, we calculate conglomerate premia and discounts for German data, using a broader data base with an increased number of observations. Our results suggest that there is a significant discount for German conglomerates. The second goal of this paper is to show a possible distortion of the premia or discounts calculated using multiples that relate to firm values. This distortion is caused by differences in corporate cash holdings between conglomerate and stand alone firms where the latter serve to derive multiples and to compute “imputed values” of a conglomerate (matched portfolios of stand alone firms) as a benchmark. As firm value is the sum of the market value of equity and the book value of debt, corporate cash and securities holdings are part of the firm value. Stand alone firm value multiples in an industry therefore reflect the cash and securities holdings of the companies in that industry; applying the aggregate multiple of an industry upon accounting figures of the different conglomerate business lines and summing up the values to compute an imputed value of the conglomerate implies a certain “imputed cash holding” of the conglomerate, that is equal to the sales-weighted average over

the aggregate cash holding of the stand alone firms in the different industries. If the actual cash holding of the conglomerate is different from the imputed one, excess values as measures of performance are biased. In order to avoid this distortion we propose a different approach to calculate excess values of conglomerates by using enterprise values instead of firm values.

Our empirical analysis supports the existence of a cash distortion for German data: as German conglomerates hold significantly more cash than their imputed cash holdings would suggest, excess values based on firm value multiples are upwards biased. We first compute excess values using the Berger/Ofek methodology based on firm value multiples. Then, following Berger/Ofek (1995) and Lins/Servaes (1999) we run a regression analysis of excess value as dependent variable on a diversification dummy and several other control variables having an impact upon sales multiples and excess values. This part of our analysis shows the same results as Lins/Servaes (1999): the diversification dummy is statistically not significant and has a coefficient of –0.055. As excess value is measured as the logarithm of the ratio between actual and imputed value, this yields a discount on conglomerates of 5.35%. Next, we test for the impact of different cash and securities holdings by adding the cash to sales ratio as an independent variable to the regression equation. The new variable is highly significant and has a positive sign; adjusted R^2 of the regression equation increases from 2.2% to 3.5%.

We then repeat our analysis using multiples based on enterprise values, thus excluding cash and securities holdings. Again applying the Berger/Ofek (1995) and Lins/Servaes (1999) regression analysis upon excess values we find a statistically significant negative impact of the diversification dummy. We report conglomerate discounts of 6,2% and 5,92% (including cash to sales).[1] Again cash to sales ratio is significantly positive, but regression coefficient and test statistic are substantially lower than for the firm value based model.

Our results therefore suggest that for German companies excess values based on firm values are upwards biased by different cash holdings; excluding these holdings and using enterprise values removes the distortion and yields a discount that is significantly linked to the diversification measure used in this study.

---

1 When comparing these findings with results of other studies, it has to be emphasized that discounts from our regression cited above are related to the enterprise value as basis, whereas usually discount or premia are related to (higher) firm value.

The rest of the paper is organised as follows: Section 2 briefly discusses possible benefits and costs of diversification and gives a survey on empirical studies, especially focussing on Germany. Section 3 describes the standard Berger/Ofek methodology for computing excess values and shows the bias caused by different cash and securities holdings when firm values are used. Section 4 describes the data used for our study. In section 5 we calculate excess values on firm value and on enterprise value basis and demonstrate the existence of the distortion; using industry means as multiples we show that the difference in excess values is equal to the cash distortion. Next, again following Berger/Ofek (1995) and Lins/Servaes (1999), we use industry medians as multiples and present the evidence from our regressions. Section 6 discusses the results and its implications.

2. Diversification and shareholder wealth

a. Theory

Along with the ups and downs of corporate diversification, financial researchers have been concerned with its benefits and costs. Most of the benefits of corporate diversification come along with the advantages of internal capital markets over external financing. By avoiding transaction cost and additional cost of informational asymmetries diversified firms with a bigger internal capital market allow for a more efficient capital allocation (e.g. Chandler 1977, Stein 1997). Other possible benefits stem from risk reduction on corporate level for diversified firms: lower cash flow volatility may increase the debt capacity of the company and thereby the tax shield of debt without facing prohibitive cost of financial distress (Lewellen 1971). Additionally lower volatility helps to reduce underinvestment cost when external financing is not available or only at prohibitive cost (e.g. Stulz 1990).

Most of the costs of diversification are related to agency problems of the firm. The overinvestment hypothesis (e.g. Jensen 1986, Stulz 1990) states that corporate managers invest too much from a shareholders perspective in order to extract private rents via maximizing resources under control. The underlying agency conflict is thus on the manager-investor level. When applying the overinvestment argument to corporate diversification, two statements can be made:

(1) decisions by management to diversify, e. g. via an acquisition of another company, are by themselves symptoms of overinvestment and therefore destroy shareolder value.[2]

(2) Conglomerate managers may be reluctant to cut down investment or extract assets from low performing business lines. This type of cross subsidization hypothesis was put forward by Meyer/Milgrom/Roberts (1992). On the other hand overinvestment in low performing business lines may cause underinvestment in fast growing, profitable segments of the conglomerate, if access to external financing is not avaliable or costly: capital expenditures in well performing businesses may be negatively affected by negative cash flows of the underperforming segments.

While in the first statement, diversification is a cause of overinvestment, in the second statement overinvestment is caused by diversification. Therefore, already a simple application of the overinvestment hypothesis to corporate diversification reveals a potential problem of reverse causality.

The narrower cross-subsidization hypothesis builds on the idea of a “socialism” among managers, leading to poorly performing business units to be supported by well performing units. Theoretical grounds for the cross-subsidization argument are, e. g., provided by Meyer et al. (1992), Rajan et al. (2000) and Wulf (2000). These papers attribute socialism across divisions to an agency conflict on the top management-divisional management level:[3] Divisional managers engage in costly activities to influence top management in order to receive higher resource allocations from headquarters and to maximize own private benefits. A similar argument is depicted by Gertner et al. (1994) who discuss that incentives of divisional managers to search new profitable investment opportunities or to improve performance of existing assets are weakened by corporate headquarter’s residual control rights over the firm’s assets. As cross-subsidization is a symptom of overinvestment, this second

---

2 Various studies find empirical evidence for this statement. See e. g. Morck et al. (1990), Comment/Jarrel (1995) and Denis et al. (1997).

3 Scharfstein/Stein (2000) go a step further and combine agency conflicts on the manager-investor and headquarters-divisional management levels in a multi-layer agency model. The implications of their analysis are that headquarters as an agent of outside investors uses internal capital allocations rather than cash wages to give incentives to divisional managers, which in turn results in a socialism where poorly performing units are subsidized by well performing units.

hypothesis is closely related to the above argument. Empirical evidence supports this view.[4]

b. Empirical Evidence

The core of the recent discussion on the determinants and implications of corporate diversification has its roots in empirical findings by Lang/Stulz (1994), Berger/Ofek (1995) and Serveas (1996) who, among others,[5] document that firms operating in multiple lines of business have significantly lower total values than matched portfolios of stand alone firms focussing on only one business segment. Berger/Ofek (1995) report an average discount for conglomerates of 13% to 15% of its firm value. As an explanation for this conglomerate discount, these papers predominantly resort to overinvestment and cross-subsidization hypotheses.[6]

Berger/Ofek (1995) start their analysis by forming peer groups of stand alone firms for different industries. Working along the SIC industry classification they choose a segment/industry specification with at least 5 stand alone firms for every year. By relating firm values (market value of common equity plus face value of debt) to different accounting variables as sales, total assets and earnings, Berger/Ofek calculate different multiples for every stand alone firm and aggregate these firm value multiples over the firms in an industry. By applying the aggregate stand alone multiplier of an industry upon the accounting figures of the conglomerate for the same segment and summing all the resulting imputed values of the segments Berger/Ofek calculate the imputed value of the conglomerate as the value of a matched portfolio of stand alone firms. The imputed value serves as a benchmark and is compared

---

4 Shin/Stulz (1998) find that investment of a diversified firm's division depends not only on the segment's own cash flow but also on the other divisions' cash flows. However, the decision of which division receives the funds does not seem depend on measures of the profitability of investment opportunities. Scharfstein (1998) explores capital expenditures and finds that divisional investments are insensitive to their respective industry q ratios. Rajan et al. (2000) document that, as compared to stand-alones, multi-segment firms allocate more resources to weak units. The authors also provide direct evidence for cross-subsidization leading to a valuation discount of conglomerate firms.

5 Additional international evidence on the existence of a conglomerate discount is presented by Lins/Servaes (1999), Lins/Servaes (2002) and Fauver/Houston/Naranjo (2002).

6 Lamont/Polk (2001) argue in a contemporaneous paper that when trying to explain determinants of the conglomerate discount, one should not only look at cash flow effects (e. g. inefficient investment) but also on return effects. In an empirical study, they show that discounted conglomerates have also higher subsequent returns than premium conglomerates, again explaining the lower overall values.

with the actual firm value of the conglomerate.[7] Lang/Stulz (1994) apply the same basic idea upon Tobins Q as a measure of value: the imputed Q of the conglomerate is compared with its actual Q.

By concentrating on market values, the analyses of Berger/Ofek and Lins/Servaes avoid some of the restrictions of earlier studies on the benefits and costs of corporate diversification: As the performance measure already reflects market values, there is no need to control for different levels of risk and different cost of capital, as would be the case for analyzing accounting or stock return performance data. Furthermore, the Berger/Ofek and Lins/Servaes approach allows to analyze the effect of diversification even if firms choose not to alter their degree of diversification, thereby avoiding the problems of event studies that are restricted on the occurrence of the event “changing the degree of diversification”.

This paper contributes to the German evidence of diversification and shareholder wealth. For Germany there are only a few studies with little data that provide mixed results. Empirical research on diversification started with Bühner (1983,1987), who analyzes the impact of different diversification strategies on accounting or stock performance measures. His sample consists of 40 firms between the years 1966 and 1981. Spindler (1988) works with the same database to analyze the impact of business cycles upon the diversifications´ success. Bühner (1998) shows for an international sample of companies that spin offs and sell offs leading to increased corporate focus are accompanied by significant abnormal returns; the sample contains also 6 German companies. More recently, Szeless (2001) uses a sample of 93 German, Austrian and Swiss companies (resp. 33 companies for a more detailled analysis) between the years 1992 and 1994. He analyzes changes of corporate diversification over time and finds no significant relation between the diversification measure, the diversification strategy and accounting or stock market performance measures. Fauver/Houston/Naranjo (2002) analyze the impact of different levels of capital market integration and of different legal environments upon the diversification discount. Their results suggest that the value of diversification for shareholders declines with the degree of capital market development and integration; Fauver/Houston/Naranjo show that the net benefits of diversification are lower in legal systems where shareholders are well protected. The authors compute excess

---

7 Berger and Ofek calculate excess values as the natural logarithm of the ratio of the actual and the imputed value. For more details of the calculation procedure see Berger/Ofek (1995) pp. 60.

values using the Berger/Ofek methodology based on firm values; they use sales to capital ratios as multiples within the industry, because segment data for assets/earnings are not available (p. 10).[8] For legal systems with German origin they report a (not significant) conglomerate premium (Table II p. 28); in their regression analysis the dummy variable capturing the impact of the German legal system is significantly positive. Fauver/Houston/Naranjo conclude that "after controlling for the other relevant factors the net costs of diversification are the smallest for firms that operate under the German legal system" (p. 14).

Lins/Servaes (1999) calculate excess values of conglomerates applying the Berger/Ofek methodology on companies in UK, Japan and Germany. Using the years 1992 and 1994 they have 401 total firm years and 145 conglomerate firm years in their German data set. For a deeper analysis of the determinants influencing excess values the authors perform a regression analysis with excess value as dependent variable. Besides a diversification dummy, other independent variables are chosen to capture the effect of profitability (sales margin), growth opportunities (capex to sales ratio) and firm size (log of total assets) on the firm value to sales multiple. The results of Lins/Servaes again show a special German result: they report a slight, but statistically insignificant conglomerate discount. The regression coefficient of the diversification dummy for German companies is 1.1% in 1992 and 5.7% in 1994 whereas the diversification dummies for the Japanese and the UK data are negative and statistically significant different from zero for both years. Besides the role of the German legal environment the authors point out that the result may be caused by the lack of German data.[9]

In recent contributions, two criticisms challenge the traditional view that the observed conglomerate discount is attributable to a prior decision to diversify the firm. The first criticism is more of a technical nature and refers to measurement error. It arises when studying the relation between measures of diversification and conglomerate discount where both measures rely on the same underlying data. As a result, a mechanical correlation between the two measures is likely to evolve, making

---

8 There are some other data limitations: in some cases there is no pure play company in an industry. See Fauver/Houston/Naranjo (2002) p. 10.

9 Lins/Servaes (1999) p. 2216. For both years Germany has the smallest sample size. Only 40% (1992) and 41% (1994) of the conglomerate segments of German firms were matched by 5 or more stand alone firms. For 12,3% (1992) and 6,4% (1994) of all segments there were no stand alone firms at all available. See footnote 7 on p. 2222.

inferences drawn on such a spurious correlation misleading. Whited (2001) examines this criticism and finds cross-subsidization symptoms to disappear when controlling for measurement error.

The second criticism refers to the causality of diversification and destruction in value which is suggested by the conglomerate discount. It is more subtle to encounter as it builds on both, theoretical and empirical arguments. A missing causality of diversification may be theoretically explained by an endogeneity of the decision to diversify: if the decision to diversify is not exogenous but itself dependent on some other variables e. g. like prior underperformance, then the observed conglomerate discount is not entirely attributable to the decision to diversify. The above discussion of the application of the overinvestment hypothesis to diversification also revealed that diversification may be rather a result of prior overinvestment tendencies where most of the agency costs already occurred. Then, the observed conglomerate discount does not only reflect the anticipation of increased future overinvestment but also to some extent past costs. These arguments are also present in theoretical models. In a model by Fluck/Lynch (1999), low-value firms optimally choose to diversify and thus trade at a discount compared to stand-alones, although their diversification decision itself created value. Along the same line, Maksimovic/Phillips (2002) show that a conglomerate discount may be caused endogenously by differences in organizational and managerial abilities of firms. A decision to diversify is then merely an optimal reaction to different competitive advantages in product markets and still congruent to a value-maximizing behaviour.[10] Empirical evidence for the presumption that diversification does not cause inefficient investment and therefore value destruction but that the observed conglomerate discount is rather by itself caused by prior underperformance is provided by Lang/Stulz (1994), Campa/Kedia (1999) and Hyland (2001). All of these studies find evidence for the fact that firms which decide to diversify are poor performers already prior to conglomeration. Similarly, Chevalier (2000) studies prior investment patterns of firms which engage in diversifying mergers. She finds out that these firms cross-subsidize weak business units even before they diversify, suggesting that selection bias

10 Similarly, Inderst/Müller (2001) study the benefits and costs of centralization to derive an optimal degree of diversification. They argue that high integration is ceteris paribus optimal for projects with low expected cash flows and low integration is optimal for projects with high expected cash flows. This would also explain the observation of a conglomerate discount which is in line with value-maximizing behaviour.

explains some of the results of the earlier studies on the existence and magnitude of cross-subsidization. Graham et al. (2002) present evidence for an alternative hypothesis: they investigate a sample of firms that engage in mergers and acquisitions and document that target firms already trade at a discount before they are added to the conglomerate. The authors conclude that half of the conglomerate discount is explained by the parent firm adding an already discounted business unit to the group. This suggests that traditional methods of measuring the conglomerate discount by using a stand-alone benchmark are misleading and might produce an overstatement of the magnitude of the discount.

However, in a contemporaneous paper, Lamont/Polk (2002) find out that even after controlling for possible measurement error and endogeneity, exogenous changes in industry cash flow diversity do have a negative impact on firm value.

3. Berger/Ofek methodology and cash distortion

The Berger/Ofek methodology to compute diversified firms' excess values has been widely used in empirical studies on corporate diversification (e.g. Servaes 1996, Lins/Servaes 1999 and Fauver/Houston/Naranjo 2002). As described in the previous section, it rests on segment accounting data and calculates an "imputed value" as a benchmark value for the conglomerate by adding up imputed segment values. These imputed segment values in turn are derived by a multiple valuation. As earnings, EBITs and asset book values are not available for the different conglomerate segments, most of the non-US studies use sales multiples.[11] The calculation of the imputed firm value ($IFV_{i,t}$) of conglomerate i operating in different segments k = 1, ..., n, builds on the following algorithm:

$$IFV_{i,t} = \sum_{k=1}^{n} Sales_{k,t} \cdot IndM_t^{FV\text{-}Sales,k} \qquad (1)$$

where $IndM_t^{FV\text{-}Sales,k}$ denotes the firm value-sales multiple for each industry k derived by aggregating the firm value - sales multiples of all stand alone firms in industry k in period t. $Sales_{k,t}$ are the conglomerate's sales in segment k and period t.

11 For US data Berger/Ofek not only use sales multiples but also asset and EBIT multiples. See Berger/Ofek pp. 48.

According to Berger/Ofek, each stand alone firm's sales multiple is calculated by dividing the firm value (FV), usually estimated by market value of equity plus book value of debt, by the firm's total sales:

$$M_{j,t}^{FV\text{-}Sales} = \frac{FV_{j,t}}{Sales_{j,t}} \tag{2}$$

For aggregation purposes, one can use the mean of all J coporate sales multiples in industry k to calculate the industry sales multiple:

$$IndM_{t}^{FV-Sales,k} = \frac{1}{J} \cdot \sum_{j=1}^{J} M_{j,t}^{FV-Sales} \tag{3}$$

Because it is to a lesser degree exposed to outliers as compared to the mean, many empirical studies use the median as an aggregate measure (e.g. Berger/Ofek 1995). The imputed firm value $IFV_{i,t}$ as per (1) is then compared with each conglomerate's actual firm value $FV_{i,t}$ to finally get each firm's excess firm value $EFV_{i,t}$ in period t:

$$EFV_{i,t} = \frac{FV_{i,t}}{IFV_{i,t}} \quad \text{or} \quad EFV_{i,t} = \ln\left(\frac{FV_{i,t}}{IFV_{i,t}}\right) \tag{4}$$

It will be shown in the following that the above standard valuation procedure is exposed to what we call "cash distortion". As a starting point, it has to be acknowledged that the firm value of each firm is simply the sum of the value of its operating assets and its cash and securities holdings. Or put differently, the firm value can be split up into the enterprise value EV (market value of equity plus net debt) and the firm's cash and securities holdings C:

$$FV_{j,t} = EV_{j,t} + C_{j,t} \tag{5}$$

Equation (5) can be used to split up equation (2) into:

$$M_{j,t}^{FV\text{-}Sales} = \frac{EV_{j,t}}{Sales_{j,t}} + \frac{C_{j,t}}{Sales_{j,t}} = M_{j,t}^{EV\text{-}Sales,k} + \frac{C_{j,t}}{Sales_{j,t}} \tag{6}$$

Equation (6) states that each stand alone's firm value-sales multiple is the sum of its enterprise value-sales multiple and its cash-to-sales ratio. As discussed, in order to aggregate all stand alone multiples in a given industry k, there are principally different statistical measures available. In order to derive the cash distortion analytically we will use the mean here.[12] Using equation (3), the industry k firm value-sales multiple can be written as:

---

12 The cash distortion cannot be derived analytically when the median is used as an aggregate multiple. The reason is that the median firm value multiples cannot be split into the median

$$IndM_t^{FV\text{-}Sales,k} = \frac{1}{J} \cdot \sum_{i=1}^{J} \frac{EV_{i,t}}{Sales_{i,t}} + \frac{1}{J} \cdot \sum_{i=1}^{J} \frac{C_{i,t}}{Sales_{j,t}} = IndM_{i,t}^{EV\text{-}Sales,k} + IndM_{i,t}^{C\text{-}Sales,k} \quad (7)$$

Equation (7) reveals that the industry firm value to sales multiple can be split into the industry enterprise value sales multiple and the average cash-to-sales ratio in the specific industry k. Finally, equation (7) is substituted into the conglomerate valuation algorithm (1):

$$IFV_{i,t} = \sum_{k=1}^{n} Sales_{k,t} \cdot IndM_t^{FV\text{-}Sales,k} = \sum_{k=1}^{n} Sales_{k,t} \cdot IndM_t^{EV-Sales,k} + \sum_{k=1}^{n} Sales_{k,t} \cdot IndM_t^{C-Sales,k}$$
$$= IEV_{i,t} + IC_{i,t} \quad (8)$$

Equation (8) breaks up the imputed firm value into the sales-weighted imputed enterprise value and the sales-weighted imputed cash and securities holdings for each conglomerate in t. The valuation algorithm (1) changes to:

$$EFV_{i,t} = \frac{FV_{i,t}}{IFV_{i,t}} = \frac{EV_{i,t} + C_{i,t}}{IEV_{i,t} + IC_{i,t}} \quad \text{or} \quad EFV_{i,t} = \ln\left(\frac{EV_{i,t} + C_{i,t}}{IEV_{i,t} + IC_{i,t}}\right) \quad \text{from which again}$$

follows that

$$EEV_{i,t} = \ln\left(\frac{EV_{i,t}}{IEV_{i,t}}\right) = \ln(FV_{i,t} - C_{i,t}) - \ln(IFV_{i,t} - IC_{i,t}) \quad (9)$$

Calculating excess values in absolute terms $EFV_{i,t}^{Abs}$, equation (9) transfers to:

$$EFV_{i,t}^{Abs} = FV_{i,t} - IFV_{i,t} = (EV_{i,t} - IEV_{i,t}) + (C_{i,t} - IC_{i,t}) \quad (10)$$

where the absolute excess value on firm value basis is the sum of the absolute excess value on enterprise value basis plus the cash distortion, which is the difference between the conglomerate's actual cash and securities holdings and its sales-weighted imputed cash holdings, derived from comparable stand alone firms' cash holdings.

Equations (9) and (10) illustrate that the Berger/Ofek methodology to compute excess values may be biased by different cash holdings. Assume for example that the conglomerate to be valued holds significantly more cash than would be expected from the sales-weighted industry cash holdings. The resulting positive cash distortion

---

enterprise value multiple and median cash to sales multiples without making additional assumptions about the exact distributions and correlations of firm value multiples, enterprise value multiples and cash holdings within industries and across industries.

leads to the excess value on firm value basis being higher than the excess value on enterprise value basis: the excess value on firm value basis is biased upwards . If the bias caused by $C_{i,t} – IC_{i,t}$ is big enough, it may turn a postive excess value based on firm value multiples into a negative excess value based on enterprise values. The Berger/Ofek measure of excess value in (9) is also exposed to the possibility of changing sign, as it uses the logarithm of the ratio between actual and imputed value. If there is, systematically, a difference between actual and imputed cash holdings of conglomerates, then average excess values and also conglomerate premia/discounts on firm value basis will differ from average excess values and conglomerate premia/discounts on enterprise value basis.

Besides the particular case of conglomerates there are some general arguments in favour of the enterprise value to be used as a measure of performance instead of the firm value. The first is, that on efficient capital markets one should not expect corporate management to earn excess returns by buying and selling risky and/or riskless securities; excess value of the cash and securities holdings should therefore be zero for any firm, be it stand alone or conglomerate. Positive or negative excess value is generated by the operating assets of the firm. Moreover, firm value may be inflated by high liquid assets which are not held to support the operating business but merely to help managers to extract their own private benefits (e. g. Jensen 1986). The second argument is that on single firm level, firm value to sales multiples may give wrong signals due to different cash holdings.[13] For corporate valuation purposes practitioners increasingly use multiples based on enterprise values.[14] Studies that analyze the impact of cash holdings therefore use net assets (i.e. total assets minus cash holdings) to normalise their measure of corporate cash holdings (e.g. Opler et al. 1999).

Summarizing, there are some general arguments for using enterprise values instead of firm values when analyzing the performance of a company or when calculating its value. However, empirical papers studying the determinants and implications of value

---

13 To show this, assume that an all-equity financed company has a market value of equity (which is equal to its firm value) of 100 Mio Euro and sales of 200 Mio Euro, resulting in a firm value to sales multiple of 0.5. If the firm raises new equity of 100 Mio Euro via a seasoned equity offering and invests this amount into securities/cash, its firm value to sales multiple increases to 1, though shareholder wealth has not changed. The firm value to sales multiple is biased, as the securities/cash holdings add to market value, but the additional benefits of the securities holdings are not reflected in the surplus measure “sales”. Investors using this multiple may infer that capital markets attribute a higher value to the sales of this company compared to its competitor not holding securities.

14 See Damodaran (2001) Chapter 17.

effects of corporate diversification rely on firm value measures. This observation, together with the above theoretical discussion about the influence of cash distortion on excess values on firm value basis, motivates the following empirical study on Germany conglomerates.

Due to the lack of detailed segment data most international studies concentrate on sales multiples. Some US-studies use market to book ratios or Tobins Q (as the ratio of market value to replacement costs) to compute excess values of conglomerates.

4. Data and Methodology

Segment data for German companies were obtained from the new international OSIRIS database provided by Bureau van Dijk Electronic Publishing. The integrated database covers 25,000 publicly listed companies from over 120 countries and pulls its information from several sources including World'Vest Base, Fitch, Thomson Financial, Reuters, Moody's etc. Stock market and financial statement data was collected from DATASTREAM and was merged with OSIRIS segment data on a firm-year basis. Due to data availability, the analysis was restrained to the years 1988 to 2001. For all segment-years, segment names with a short description of the respective line of business were available. In some of the cases, four-digit SIC codes could already be directly obtained from OSIRIS. Where there was no four-digit SIC code available, SIC codes were manually assigned to each of the segments according to the description of the line of business and the matching description of the SIC code to be assigned. Although this procedure is prone to subjectivity, it is basically equivalent to the assignment procedure used by Computstat staff (Villalonga 2002). As only two-digit-SIC codes were used to define different industries, the potential bias created by subjectively assigning SIC codes to segment names is further reduced. When it was not possible to assign a matching SIC code, the segment-year was eliminated from the analysis. Following this procedure, a total of 4,621 segment-years with SIC codes could be obtained from OSIRIS. As for only 9% (7%) of segments profit (asset) data was available, the further analysis is exclusively based on segment sales figures. Again according to the existing literature, we exclude firms operating in the financial sector from the analysis. This

leaves 2,540 segment-years available for our study, of which 1,358 belong to diversified firms operating in more than one 2-digit SIC industry.

In a next step, for each 2-digit SIC industry with at least one stand alone firm in each year, median and mean industry sales multiples were calculated. Lins/Servaes (1999) also allow peer groups to consist of only one firm and in some cases even have to accept "empty industries".[15]

Then, for each stand alone firm, a firm value-sales multiple and an enterprise value-sales multiple was calculated. These multiples were aggregated by using the median and the mean to obtain industry multiples.

Therefore, we calculated four different excess values for each firm, depending on the aggregation of multiples (mean, median) and the inclusion of cash holdings (firm value, enterprise value). Figure I illustrates the four excess values:

Figure I

Different excess values measures and usage in empirical studies

	Firm Value/Sales	**Enterprise Value/Sales**
Industry Median Multiple	Berger/Ofek excess value (standard in literature)	Not discussed in existing literature
Industry Mean Multiple	Not used because of sensitifity to outliers	Not discussed (maybe due to outlier sensitifiy)

Figure I reveals that only the excess value in the upper left box is used in the Berger/Ofek methodology. The other measures (excess values on the basis of median enterprise value-sales multiples, excess values on the basis of mean enterprise value-sales multiples and firm value-sales multiples) are either not discussed or found inappropriate (e. g. Berger/Ofek 1995 with respect to industry mean multiples).

15 See Footnote 8 in this paper.

Furthermore, all firm-years were excluded in which the sum of the available segment sales was less than 95% of total sales as reported by the firm. Firm-years in which not all segments were duplicable were also excluded. As in Berger/Ofek (1995), we also exclude outliers where the actual value is more than 400% or less than 25% of the imputed value. The rest of the valuation procedure follows Berger/Ofek (1995). The final sample consists of 1,052 firm-years, of which 203 are diversified.

We define a couple of variables for each firm. The number of segments reflects the different 2-digit SIC codes a firm is operating in a given year. The capex-to-sales ratio is defined as gross additions to tangible and intangible assets, divided by total sales. Similarly, the operating profit-to-sales ratio divides operating profit by total sales. Firm size is proxied by the natural logarithm of total assets. The cash-to-sales ratio measures cash and securities holdings, divided by total sales. Finally, market-to-book value ratio is defined as total assets plus market value of equity minus book value of equity, divided by total assets.
The following table gives an overview of mean and median summary statistics of the data for a common sample of firms.

Table I

Summary statistics

Descriptive statistics for a sample of 1048 observations of stand-alone and diversified firms. Diversified firms are firms that operate in two or more two-digit SIC code industries. Stand-alone firms are firms that operate in only one two-digit SIC code industry. Number of segments is the number of different SIC code industries in which the firm operates.

	No. of Seg.	Capex-to-Sales	Op.Profit-to-Sales	Log of Assets	Cash-to-Sales	Market-to-Book	Obs.
All - Mean	1.259	0.108	0.052	12.363	0.121	1.488	1048
All - Median	1.000	0.071	0.048	12.173	0.045	1.209	1048
Diversified - Mean	2.335	0.099	0.036	12.816	0.076	1.345	203
Diversified - Median	2.000	0.083	0.045	12.414	0.041	1.127	203
Standalone - Mean	1.000	0.110	0.056	12.255	0.132	1.523	845
Standalone - Median	1.000	0.068	0.048	12.081	0.045	1.233	845

Table I shows that diversified firms of our data set have on average 2.335 segments. They have lower operating profit-to-sales ratios than stand alone firms but are larger in size.[16] market-to-book ratios are higher for stand alone firms. Diversified firms – on average – seem to hold less cash than stand alone firms. Note that this result does not imply any assertion about the cash distortion: if conglomerates are more active in industries with low average cash holdings the imputed cash holding may still be lower than the actual cash holding.

5. Results

First we work through the upper left box of figure I and therefore use the standard Berger/Ofek methodology for calculating excess values on firm value basis using median industry multiples. Following Berger/Ofek (1995) and Lins/Servaes (1999) we run an OLS-regression for our database. The regression includes a diversification dummy, the capex-to-sales ratio, the operating profit-to-sales ratio and the natural logarithm of total assets as independent variables. As the regression relies on pooled data, dummy variables for the different years are also included. Standard errors are calculated using White's (1980) heteroskedastisity-consistent variance-covariance matrix. The regression results are reported in table II.[17]

16 Lins/Servaes only report results for their entire sample of all three countries without referring to the numbers for stand alones and conglomerates separately (p. 2221). They also report conglomerates being larger than stand alones. The authors do not find any significant differences in profitability and capital spending for the firms of their study.

17 Coefficients of the different year dummies are not reported here. None of the coefficients is statistically significant on a 10% level.

Table II

Regression Model of Excess Value (Firm value, median) on independent variables

Regression model

Excess value = $a + b_1$ (diversification dummy) + b_2 (capital expenditure -to-sales ratio)

+ b_3 (op. profit-to-sales ratio) + b_4 (ln assets) + e.

Excess value is defined as the natural logarithm of the ratio of a corporations actual firm value to its imputed firm value. Diversification dummy is an indicator variable set equal to one if the firm operates in two or more segments where a segment is defined as a two-digit SIC code industry. The *p*-value of the *t*-test of equality of the coefficient to zero is reported in parentheses.

Variable	
Constant	-0.282
	(0.003)
Diversification Dummy	-0.055
	(0.105)
Capex-to-Sales Ratio	0.324
	(0.000)
Profit-to-Sales Ratio	-0.037
	(0.641)
Log of Total Assets	0.019
	(0.006)
Adjusted R^2	0.022
Number of observations	1052

Table II reveals that we are not able to document a significant conglomerate discount. The coefficient of the diversification dummy is –0.055 but its p-value is only 0.105. The adjusted R^2 is 0.022. This result is equivalent to the findings of Lins/Servaes (1999). They report a discount of 1.1% (p = 0.87) and 5.7% (p = 0.44) for 1992 and 1994 resp. which is statistically not significant (see Lins/Servaes 1999, p. 2224). Investment spending has the expected sign, being highly significant. Profitability has a negative impact upon excess value but is not statistically significant. Size is positively related to excess value, being significant below the 1%

level. The first two results reflect to some extent the findings of Lins/Servaes.[18] The constant is negative and significant.[19]

We then include the cash-to-sales ratio as an independent variable into the above regression specification in order to check whether cash holdings have an impact on excess value measure on firm value basis. The results are documented in table III.

Table III

Regression Model of Excess Value (Firm value, median) on independent variables, including cash-to-sales

Regression model

Excess value = $a + b_1$ (diversification dummy) + b_2 (cash-to-sales ratio) + b_3 (capital expenditure -to-sales ratio) + b_4 (po. profit-to-sales ratio) + b_5 (ln assets) + e.

Excess value is defined as the natural logarithm of the ratio of a corporations actual firm value to its imputed firm value. Diversification dummy is an indicator variable set equal to one if the firm operates in two or more segments where a segment is defined as a two-digit SIC code industry. The *p*-value of the *t*-test of equality of the coefficient to zero is reported in parentheses.

Variable	
Constant	-0.294
	(0.002)
Diversification Dummy	-0.049
	(0.143)
Cash-to-Sales Ratio	0.124
	(0.004)
Capex-to-Sales Ratio	0.302
	(0.000)
Profit-to-Sales Ratio	-0.097
	(0.280)
Log of Total Assets	0.019
	(0.006)
Adjusted R^2	0.035
Number of observations	1052

18 The authors report a significantly positive coefficient of capital expenditures (in the 1992 regression) and a positive, and insignificant coefficient of profitability (in the 1994 regression). Lins/Servaes also point out that there are some inconsistencies concerning the effect of their control variables: capital expenditure and profitability are only significant in one of the two regressions. Firm size is negatively related to excess value, whereas our results point in the opposite direction. But Lins/Servaes also report some outlier problems in their firm size data (p. 2223).

19 Berger/Ofek (1995) also report a negative and significant constant in their sales-multiples regression but do not give an interpretation of this finding (p. 50). It reflects the fact that there is an average discount which is not explained by the independent variables diversification, investment, profitability or size.

Table III states that the coefficient of the newly included variable is positive and highly significant (below 1% level): excess values on firm value basis are significantly influenced by the level of cash holdings. At the same time, the significance of the diversification dummy drops. The regression coefficients of the other control variables are not materially affected. Adjusted R^2 increases to 3.5%.

As the positive coefficient of cash to sales holds for all firms (stand alones and conglomerates) we may not yet attribute this result to the distortion that affects only conglomerates. At this point the entire impact may also be caused by general benefits of corporate cash holdings that are related to the operating business of the firm. Cash holdings may prevent underinvestment in the operating business (e. g. Kim et al. 1998, Opler et al. 1999) and save the potential costs related to it. These benefits are in particular valuable for growth firms with a large number of profitable investment opportunities, firms with a high volatility in operating cash flows and smaller firms with costly access to external capital. Though displaying highly significant regression coefficients the explanatory power of the model is still low when compared to other studies.[20]

Second the theoretical findings that have been presented in section 3 are empirically analysed in more depth. In order to do so, we now use the mean to aggregate stand alone firm value-sales and enterprise value-sales multiples in each industry. Therefore we move to the lower region of figure I and recalculate our excess values accordingly. The reason for using means here is simply to show the congruence of our theoretical arguments and the empirical findings.

However, by doing so we have to exclude more data as for some firm-years only cash-sales-ratios but no firm values or enterprise values are available. Not excluding these cases would lead to a different number of stand alone firms when calculating the average industry cash holdings and when calculating the average industry sales multiples. This would create an unnecessary conflict with equation (7), which is of course not intended.

We begin the analysis by looking at the absolute excess values on firm value and enterprise values, as well as the cash distortion for all firms (see equation 10). Table IV reports the mean absolute differences in thousand €.

---

20 Lins/Serveas (p. 2224) report a R^2 of 11% in the 1992 and 5% in the 1994 regression. Berger/Ofek, while resting on a larger database, report R^2 of 11.4% for their firm value to sales multiple based model (pp. 50).

It becomes obvious that conglomerate firms do hold a lot more cash than their imputed cash holdings would suggest. Additionally, equation (10) can be easily confirmed empirically using the information from table IV: adding up the values from the EV-IEV and C-IC columns exactly gets the value from the FV-IFV column.

Table IV

Absolute excess values and cash distortion

FV-IFV is the average absolute difference between actual firm value and imputed firm value. EV-IFV is the average absolute difference between actual enterprise value and imputed enterprise value. C-IC is the average absolute difference between actual cash holdings and imputed cash holdings. Imputed values are calculated using industry means.[21] All values are in thousand €.

	FV - IFV	EV - IEV	C - IC	Obs.
Average absolute difference (only conglomerates)	-153,622.98	-243,186.68	89,563.70	123

Moreover, table IV shows that on average, conglomerates have negative absolute excess values – the excess value on firm value basis (FV-IFV) however is substantially higher than the excess value on enterprise value basis (EV-IEV).[22] These findings are confirmed in the following figure II, where for all data points, the cash distortion is plotted on the vertical axis and the difference between absolute excess value on firm value and enterprise value on the horizontal axis.

21 Only observations with firm value, enterprise value and cash holdings data were used. Excess value outliers, both on firm value and on enterprise value basis, are excluded as described in section 4.

22 The median cash distortion is slightly negative for conglomerates. To determine the impact of the cash distortion on the regression results, however, the (positive) average cash distortion is relevant.

Figure II

Graphical representation of equation (10)

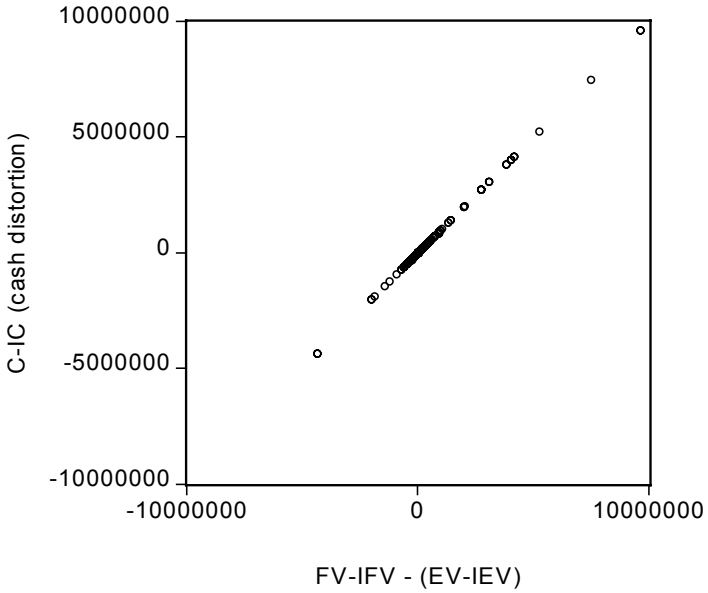
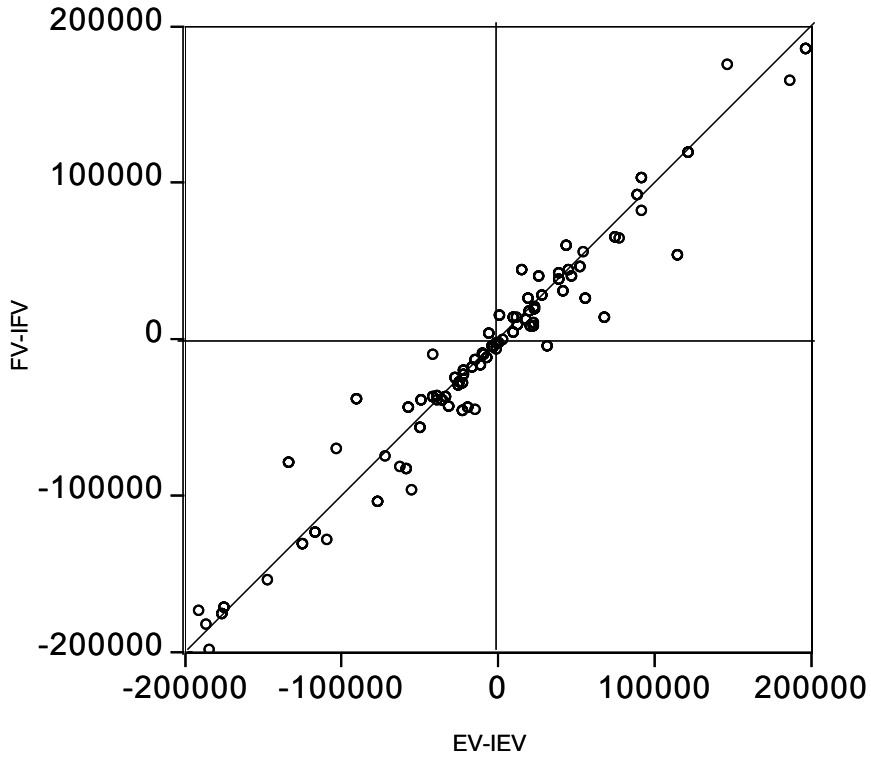


Figure II illustrates that in fact, all data points lie on the 45°-line. Equation (10) is therefore empirically supported by our German data set.

As argued above using excess values measured on firm value basis as compared to excess values measured on enterprise value basis may yield misleading results: e. g. it is possible that excess values on firm value basis suggest a conglomerate premium whereas excess values on enterprise value basis suggest a conglomerate discount for a given firm. The reason for the difference is the cash distortion. Figure III plots the absolute excess value on firm value basis (FV-IFV) on the vertical axis and absolute excess value on enterprise value basis (EV-IEV) on the horizontal axis still using mean as an aggregate multiple. The illustrated region is restricted to absolute excess values of +/- 200,000 thousand € for graphical purposes. Only conglomerates are considered in figure III.

Figure III

Absolute excess values on firm value and enterprise value basis



Observations above the 45^0 – line reflect the case of the upwards cash bias: if conglomerates actually hold more cash than the imputed cash, their excess value based on firm value multiples is higher than based on enterprise value multiples. Observations below the 45^0 – line show the downward biased performance by lower than imputed cash holdings: excess value based on firm values is lower than based on enterprise values.

It becomes obvious from figure III that there are some data points in the upper left and lower right quadrants. These firms have positive absolute excess values on firm value basis but negative excess values on enterprise value basis (upper left quadrant) or negative absolute excess values on firm value basis and positive excess value on enterprise value basis (lower right quadrant). The switching of signs occurs if the positive cash distortion exceeds the firm value based excess value (upper left) and if the negative cash distortion is lower than the negative excess value (based on firm value multiples). This result will of course prevail if one measures excess values not in absolute terms, but in relative terms according to equation (9) as the switching of signs also remains there. If the mean is used to calculate industry multiples, about

1% of all cases have a switching of signs with positive (negative) excess values on firm value basis and negative (positive) excess values on enterprise value basis. It turns out that when using median as aggregate measure, about 3% of all cases are misclassified, i. e. lie either in the upper left or lower right quadrant of figure III. We additionally check for robustness by running a regression analysis with the difference of firm value and enterprise value excess values computed on mean based multiples as dependent and the difference of firm value and enterprise value excess values based on median multiples as independent variable. This regression implicitly tests whether the cash distortion on mean basis is comparable to the implicit cash distortion on median basis. The results suggest a high degree of comparability between the mean based and the median based results: The regression captures 86% of the variance, displaying a regression coefficient of 0.63 (significant on 0% - level).[23]

Finally, we want to use the insights from the previous analysis to configure our regression results from the first part of the empirical study. Thus, we switch again back to aggregating sales multiples using the median, which is the usual procedure in the literature. In order to eliminate the influence of the cash distortion, we now compute excess values not on firm value but on enterprise value basis. In terms of figure I, we therefore finally move to the upper right quadrant.
We perform the same basic Lins/Servaes (1999) regression with excess value on enterprise value basis as the dependent variable.

23 To check whether our results are robust when using median aggregate multiples we perform several additional analyses. We run regression analyses with mean based excess values as dependent and median based excess values as independent variables each for firm value and for enterprise value based multiples. We directly calculate the imputed cash holdings on median basis by using the median cash holdings in each industry and compare the resulting cash distortion with the cash distortion on mean basis. The results of these additional regressions are not reported here, but also suggest that our main findings are not materially affected.

Table V

Regression Model of Excess Value (Enterprise value, median) on independent variables

Regression model

Excess value = $a + b_1$ (diversification dummy) + b_2 (capital expenditure-to-sales ratio)

+ b_3 (op. profit-to-sales ratio) + b_4 (ln assets) + e.

Excess value is defined as the natural logarithm of the ratio of a corporations actual enterprise value to its imputed enterprise value. Diversification dummy is an indicator variable set equal to one if the firm operates in two or more segments where a segment is defined as a two-digit SIC code industry. The *p*-value of the *t*-test of equality of the coefficient to zero is reported in parentheses.

Variable	
Constant	-0.176
	(0.078)
Diversification Dummy	-0.064
	(0.069)
Capex-to-Sales Ratio	0.351
	(0.000)
Profit-to-Sales Ratio	-0.064
	(0.388)
Log of Total Assets	0.012
	(0.103)
Adjusted R^2	0.020
Number of observations	1049

Table V reveals that the coefficient of the diversification dummy is now –0.064 and significant at the 10%-level. This suggests that there exists a significant conglomerate discount of 6.2% if excess values are measured on enterprise value basis. The coefficients of capital expenditures and of profitability do not change materially, but the (positive) size effect turns insignificant. The adjusted R^2 of the regression is similar to the first regression based on firm values.

Table VI

Regression Model of Excess Value (Enterprise value, median) on independent variables, including cash-to-sales

Regression model

Excess value = $a + b_1$ (diversification dummy) + b_2 (cash-to-sales ratio) + b_3 (capital expenditure-to-sales ratio) + b_4 (op. profit-to-sales ratio) + b_5 (ln assets) + e.

Excess value is defined as the natural logarithm of the ratio of a corporations actual enterprise value to its imputed enterprise value. Diversification dummy is an indicator variable set equal to one if the firm operates in two or more segments where a segment is defined as a two-digit SIC code industry. The *p*-value of the *t*-test of equality of the coefficient to zero is reported in parentheses.

Variable	
Constant	-0.181
	(0.070)
Diversification Dummy	-0.061
	(0.079)
Cash-to-Sales Ratio	0.052
	(0.007)
Capex-to-Sales Ratio	0.343
	(0.000)
Profit-to-Sales Ratio	-0.090
	(0.225)
Log of Total Assets	0.012
	(0.104)
Adjusted R^2	0.021
Number of observations	1049

Next, we again include the cash-to-sales ratio into the above specification and rerun the regression with this additional independent variable. Table VI shows the results. The diversification dummy is again negative and significant below the 10% level, suggesting a conglomerate discount of approximately 5.9% on enterprise value basis for our German data. The cash-to-sales ratio is again significantly positive; the other control variables are not affected. However, adding cash-to-sales only increases adjusted R^2 by 0.001 as opposed to 0.013 for the firm value regressions in tables II and III. Thus, the additional explanatory power of cash-to-sales is much lesser when measuring excess values on enterprise value basis. This is also reflected by the size of the regression coefficient of the cash-to-sales ratio in Table VIII: though still being significantly different from zero on the 1% level, it drops from 12.4% to 5.2% by almost 60%. We interpret this finding as evidence that our results based on firm values have been biased by the distorted excess values of conglomerates.

6. Discussion

The valuation effects of corporate diversification have been studied in great detail in the recent literature. Many of these empirical studies employ the Berger/Ofek (1995) methodology to compute excess values of conglomerate firms. These excess values are usually measured on a firm value basis. We show both theoretically and empirically that following this procedure may create biased excess values if the conglomerates to be valued hold more or less cash than the sales-weighted average cash holdings of the industry peer groups suggest. If conglomerates have on average more cash than their stand alone peers on a segment basis, excess values on firm value basis will be biased upwards and vice versa. We therefore suggest to measure excess values on enterprise value basis, thus subtracting cash holdings from firm value. This avoids the above problem of cash distortion and focuses the valuation on the operating assets. Besides the distortion of conglomerates performance several other arguments generally favour the use of enterprise values: e. g. management should not be able to create excess value with cash and securities holdings in efficient capital markets. Moreover, firm value measures are exposed to willingly inflated liquid assets which may only serve management's private purposes.

We empirically study the valuation effects of corporate diversification using a new database for German firms, allowing us to work with a large data set for German data. In line with the results of Lins/Servaes (1999), we also do not find a significant diversification discount for Germany if we measure excess values on a firm value basis. We are able to show that our theoretical argument concerning the cash distortion of excess values on firm value basis is verified empirically. The difference between excess values on firm value and enterprise value basis equals the cash distortion. Also, we show that for a given firm, the excess value on firm value basis may be positive (negative) whereas the excess value on enterprise value basis is negative (positive). This underpins the central issue raised in this paper: it is critical to the overall results of any empirical study resting on Berger/Ofek methodology whether one measures excess values on firm value or on enterprise value basis. For our German database, we show that there is a positive cash distortion on average: the conglomerates hold more cash than suggested by the average sales-weighted

cash holdings of assigned stand alone firms.[24] Using excess values on enterprise value basis, we are able to show that there exists a significant conglomerate discount for Germany. This is in contrast to the findings of Lins/Servaes (1999) and Fauver/Houston/Naranjo (2002) who report a "special role" of Germany with respect to the otherwise widely documented average conglomerate discounts. This special role may still be attributed to the magnitude of the discount: related to enterprise values the average discount is about 6% and thus substantially lower than the discounts reported for other countries (that relate to higher firm values).

Our analysis has some limitations. First we proof our theoretical arguments using the mean as an aggregation metric for transferring a distribution of firm specific sales multiples into a representative industry sales multiple. However, medians are dominantly used in empirical studies as the aggregation metric. The reason for using means in our theoretical considerations is simply that it is not possible to show the same effects for the median without making additional assumptions on distributions of firm values, enterprise values and cash holdings across diversified firms and stand alone firms. Nevertheless we show that the bias is empirically also in effect if weemploy the median as the aggregation metric. Second our database is still very small if compared to the studies of Berger/Ofek (1995) and others. However, if compared to other studies using German data as e. g. Lins/Servaes (1999), we seem to have a rich data set. Third the cash-to-sales ratio is still positive and significant in our regressions of excess value on enterprise value basis, though its influence is significantly lower than for the regressions of excess value on firm value basis. Our ad hoc-interpretation of this result is that corporate cash holdings may have a positive impact on enterprise value excess measures as they may help to avoid costly underinvestment, thereby positively affecting enterprise value. As this result holds for **all** firms it does not affect our evidence that excess firm values of conglomerates are upwards biased as these firms hold on average more cash than matched portfolios of stand alone firms.

In spite of this, more research is necessary to analyse the influence of cash holdings, both on excess values on enterprise value and firm value basis. Finally, the low explanatory power of the enterprise value based model (adj. R^2 = 2.1%) may raise

---

24 The median cash distortion is slightly negative for our German data set. As the *average* cash distortion is relevant when assessing the impact of cash distortion on the regressions results this is not in contrast to our findings.

some concerns. It is lower than for the firm value based model (adj. R^2 =3.5%), thus in part contradicting our hypothesis of theoretical superiority.

In conclusion, our results suggest to measure excess values on an enterprise value basis in empirical studies concerned with the valuation effects of corporate diversification. In this context, it would be interesting to verify whether the results by Berger/Ofek (1995) and others will also be affected by different cash holdings of stand alone and conglomerate firms. Second we are able to document a significant conglomerate discount in Germany when using excess values on enterprise value basis.

References

Berger, P./Ofek, E. (1995): Diversification's effect on firm value, Journal of Financial Economics, Vol. 37, 1995, pp. 39 – 65.

Campa, J./Kedia, S. (1999): Explaining the diversification discount, Working Paper, Harvard Business School 1999.

Chevalier, J. A. (2000): What do we know about cross-subsidization? Evidence from the investment policies of merging firms, working paper, University of Chicago 2000.

Comment, R./Jarrell, G. A. (1995): Corporate focus and stock returns, Journal of Financial Economics, Vol. 37, 1995, pp. 67 – 87.

Copeland, T./Koller, T./Murrin, J. (1996): Valuation, 2nd ed., New York 1996.

Denis, D. J./Denis, D. K./Sarin, A. (1997): Agency problems, equity ownership, and corporate diversification, Journal of Finance, Vol. 52, 1997, pp. 135 – 160.

Dittmar, A./Mahrt-Smith, J./Servaes, H. (2002) Corporate Liquidity Working Paper, London Business School, 2002

Fleming, G./Oliver, B./Skourakis, S. (2001): The Market Value of Diversified Firms in Australia, Working Paper, Australian National University, Canberra, 2001

Fluck, S./Lynch, A. W. (1999): Why do firms merge and then divest? A theory of financial synergy, Journal of Business, Vol. 72, 1999, pp. 319 – 346.

Gertner, R. H./Scharfstein, D. S./Stein, J. C. (1994): Internal versus external capital markets, Quarterly Journal of Economics, Vol. 109, 1994, pp. 1211 – 1230.

Graham, J. R./Lemmon, M. L./Wolf, J. G. (2002): Does corporate diversification destroy value? Journal of Finance, Vol. 57, 2002, pp. 695 – 720.

Harford, J. (1999): Corporate cash reserves and acquisitions, Journal of Finance, Vol. 54, No. 6, pp. 1969 – 1997.

Hellwig, M. F./Laux, C./Müller, H. M. (2002): Conglomeration: good, bad, or unavoidable?, Schmalenbach Business Review, Special Issue 01/02, 2002, pp. 55 – 78.

Hyland, D. (2001): Why firms diversify: An empirical examination, Working Paper, University of Texas, Arlington 2001.

Inderst, R./Müller, H. M. (2001): Corporate borrowing and financing constraints, CEPR Discussion Paper No. 2784, 2001.

Jensen, M. C. (1986): Agency costs of free cash flow, corporate finance and takeovers, American Economic Review, Vol. 76, 1986, pp. 323 – 329.

Kim, C.-S./Mauer, D. C./Sherman, A. E. (1998): The determinants of corporate liquidity: Theory and evidence, Journal of Financial and Quantitative Analysis, Vol. 33, No. 3, 1998, pp. 335 – 359.

Lamont, O. A./Polk, C. (2001): The diversification discount: cash flows versus returns, Journal of Finance, Vol. 56, 2001, pp. 1693 – 1721.

Lamont, O. A./Polk, C. (2002): Does diversification destroy value? Evidence from industry shocks, Journal of Financial Economics, Vol. 55, 2002, pp. 51-77.

Lang, L./Stulz, R. (1994): Tobin's Q, corporate diversification, and firm performance, Journal of Political Economy, Vol. 102, 1994, pp. 1248 – 1280.

Lins, K./Servaes, H. (1999): International evidence on the value of corporate diversification, Journal of Finance, Vol. 54, 1999, pp. 2215 – 2239.

Lins, K./Servaes, H. (2002) : Is corporate diversification beneficial in emerging markets ?, Financial Management, Summer 2002, pp. 5 – 31.

Maksimovic, V./Phillips, G. (2002): Do conglomerate firms allocate resources inefficiently?, Journal of Finance, Vol. 57, 2002, pp. 721 – 767.

Meyer, M./Milgrom, P. R./Roberts, D. J. (1992): Organizational prospects, influence costs, and ownership changes, Journal of Economics and Management Strategy, Vol. 1, 1992, pp. 9 – 35.

Morck, R./Shleifer, A./Vishny, R. (1990): Do managerial motives drive bad acquisitions? Journal of Finance, Vol. 45, 1990, pp. 31 – 48.

Opler, T./Pinkowitz, L. F./Stulz, R. M./Williamson, R. (1999): The determinants and implications of corporate cash holdings, in: Journal of Financial Economics, Vol. 52, Iss. 1, 1999, pp. 3 –46.

Rajan, R./Servaes, H./Zingales, L. (2000): The cost of diversity: the diversification discount and inefficient investment, Journal of Finance, Vol. 55, 2000, pp. 35 – 80.

Scharfstein, D. S. (1998): The dark side of internal capital markets II: evidence from diversified conglomerates, NBER Working Paper No. 6352, 1998.

Scharfstein, D. S./Stein, J. C. (2000): The dark side of internal capital markets: divisional rent-seeking and inefficient investment, Journal of Finance, Vol. 55, 2000, pp. 2537 – 2537.

Servaes, H. (1996): The value of diversification during the conglomerate merger wave, Journal of Finance, Vol. 51, 1996, pp. 1201 – 1225.

Shin, H.-H./Stulz, R. M. (1998): Are internal capital markets efficient?, Quarterly Journal of Economics, 1998, pp. 531 – 552.

Stulz, R. M. (1990): Managerial discretion and optimal financing policies, Journal of Financial Economics, 1990, pp. 3 – 26.

Villalonga, B. (2002): Does diversificatino cause the “diversification discount”, working paper, Harvard Business School 2002.

Wulf, J. (2000): Influence and inefficiency in the internal capital market: theory and evidence, working paper, University of Pennsylvania 2000.