



## Is the diversification discount caused by the book value bias of debt? ☆

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### ABSTRACT

We analyze whether the diversification discount is driven by the book value bias of corporate debt. Book values of debt may be a more downward biased proxy of the market value of debt for diversified firms, relative to undiversified firms, as diversification leads to lower firm risk. Thus, measures of firm value based on book values of debt undervalue diversified firms relative to focused firms. Our paper complements recent literature which uses market values to test the risk reduction hypothesis for a subsample of firms for which debt is traded. Alternatively, we employ market value of debt estimates for the whole firm universe. Consistent with the above hypothesis, we show that the use of book values of debt underestimates the value of diversified firms. There is no discount for mainly equity financed firms and lower distress risk and equity volatility for diversified firms. More concentrated ownership increases firm valuation.

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### 1. Introduction

The benefits and costs of corporate diversification have been the subject of extensive empirical and theoretical research.<sup>1</sup> Weston (1970) suggests that diversified firms have the ability to use economies of scale because they provide more efficient operations and more profitable lines of business when compared to stand-alone

firms. Lewellen (1971) argues that diversified firms enjoy greater debt capacity and debt tax shields relative to single-line firms due to lower firm risk. Furthermore, diversification can create internal capital markets that enable firms to pool and reallocate corporate resources more efficiently through “winner picking” than through external financing, which may increase investment efficiency (see, e.g., Stein, 1997).

The negative impacts of corporate diversification are often described in terms of inefficient investments due to cross-subsidization between divisions. Rajan et al. (2000), for example, model distortions caused by internal power struggles among the divisions of a diversified firm in the course of the resource allocation process. Other costs of diversification include investments in lines of businesses with poor investment opportunities (e.g., Stulz, 1990). Jensen (1986) argues that diversified firms invest more in negative cash flow projects than their segments would if operated independently. This argument is reinforced by the influence cost model of Meyer et al. (1992), in which lower-level managers of a firm attempt to lobby top management to increase the investment flows available to their business segment, even if the business segment has poor future growth prospects. Compared to focused firms, lobbying leads to inefficiencies in diversified organizations.

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<sup>1</sup> Recent surveys of this literature are Hellwig et al. (2002), Maksimovic and Phillips (2007), Martin and Sayrak (2003), and Stein (2003).

Scharfstein and Stein (2000) suggest that rent-seeking behavior by divisional managers undermines the functioning of internal capital markets and leads to inefficient investments. Overall, the published literature on corporate diversification suggests that conglomeration is associated with greater agency costs. These agency costs are manifested in the form of accepting negative net present value projects, which reduce the value of a firm.

The empirical literature mainly documents a so-called “diversification discount”. As developed by Lang and Stulz (1994) and Berger and Ofek (1995), the diversification discount compares the market value of a diversified firm to the imputed stand-alone values of its individual segments. These imputed values are based on multiples (such as price-to-book value or price-to-sales) of comparable pure-play firms in the same industry as the corresponding diversified firm’s segments. Using data from the US, these authors find substantial mean discounts on the order of 15%, which they interpret as evidence of value destruction of diversified firms. This work has been extended to a variety of other sample periods and countries by Servaes (1996), Lins and Servaes (1999), or Lins and Servaes (2002). Results suggest that the diversification discount is a pervasive phenomenon.

However, a number of other papers cast doubt on the interpretation that the diversification discount reflects value destruction. Campa and Kedia (2002), Chevalier (2004), Graham et al. (2002), and Villalonga (2004) all argue in one way or another that the discount is driven by endogeneity bias, as relatively weak firms are the ones that choose to diversify in the first place. A balanced reading of these papers suggests that accounting for this endogeneity bias reduces – though does not eliminate – the discount.

Overall, the diversification discount seems to be such a stable fact that consulting firms base their strategy suggestions on these findings. For example, the Boston Consulting Group (2006) writes how diversified firms can create value. Even textbooks pick up the arguments of the early literature and state that the diversification discount is likely to be the consequence of agency problems and inefficient resource allocation in conglomerates (see, e.g., Hill and Jones, 2007).

Despite the vast amount of literature on the diversification discount one aspect of the Berger and Ofek (1995) excess value measure is hardly addressed: the risk effects of conglomeration and its subsequent impact on firm value. While diversification reduces shareholder value, it enhances bondholder value due to a reduction in firm risk. Mansi and Reeb (2002) is the only published study which makes this point. They obtain the market values of both debt and equity for a subset of US firms and examine the bias of using book values of debt to compute excess values. Consistent with the hypothesis that diversification leads to lower firm risk, they find that book values of debt are a more downward biased proxy of the market value of debt for diversified firms, relative to undiversified firms. This finding suggests that measures of firm values based on book values of debt systematically undervalue diversified firms. When considering the joint impact of diversification on debt and equity holders, they find that, on average, corporate diversification is insignificantly related to excess firm value. Their conclusion is that diversification reduces shareholder value, increases bondholder value, and has no significant impact on total firm value.

Given that several theoretical papers examine the consequences of corporate diversification by explicitly assuming that it leads to lower firm risk, it is surprising that Mansi and Reeb (2002) is the only published empirical study dealing with the risk effect of corporate diversification and its impact on firm value that we are aware of. For example, Lewellen (1971) argues that diversified companies enjoy higher debt capacities as their default risk is lower. As a consequence, the value of the company’s tax shield increases, which enhances the company’s overall value as well. Amihud and Lev (1981) argue that managers engage in corporate

diversification, even if it reduces shareholder value, to reduce their human capital risk. The assumption is that corporate diversification lowers firm risk. In a contingent claims framework, lowering firm risk should lower shareholder value and increase bondholder value.

Our analysis complements the study of Mansi and Reeb (2002). In principal, there are two ways to test the risk reduction hypothesis of corporate diversification. One way is suggested by Mansi and Reeb (2002). They use actual market values of debt which they obtain from the Lehman Brothers Fixed Income database and analyze the diversification discount for a subsample of firms for which debt is traded (13% of all US firms). Our study follows an alternative approach and tests the risk reduction hypothesis for the whole listed firm universe in a country (in our case a sample of all German non-financial CDAX firms from 2000 to 2006), which goes at the cost that market values of debt have to be estimated. This is due to the fact that even if one has access to a research database to infer the market price of debt, most corporate debt is not traded. This is especially true for bank-based systems like Germany. In this case one either has to use estimates of market values or to rely on book values. As a solution to this problem, we employ several specifications of the Merton (1974) bond pricing model which were previously used in different research contexts to estimate the market value of the firm’s assets. Our estimation procedure, which will be described in detail below, requires only very little additional information and can thus be implemented for almost all focused and diversified companies for which an excess value based on debt book values can be calculated. Eberhart (2005) shows that applications of the Merton (1974) model provide more accurate debt value estimates than the book value approximation.

Our study is related to a recent working paper by Ammann et al. (2008) who treat the entire long-term debt on the books of firms as one coupon bond with the coupon set equal to the interest expenses on all debt. They then value this coupon bond at the current cost of debt for the company approximated by the yield of a bond portfolio with the same credit rating. As Compustat provides an official credit rating from S&P only for a very limited subset of their sample, they alternatively construct an artificial credit rating based on the interest coverage ratio. Their sample consists of all firms with data reported on both the Compustat Industrial Annual and Segment data files and covers the period from 1998 to 2005. Ammann et al. (2008) show with their approximation of the market value of debt that the potential effect of accounting for differences between the market and book value of debt on the conglomerate discount in the US is limited.

Our main findings can be summarized as follows. In a first step, we document that German conglomerates trade at a significant discount of 15% when the traditional Berger and Ofek (1995) measure is used. Consistent with the risk reduction hypothesis and in line with Mansi and Reeb (2002), we provide evidence that the use of book values of corporate debt in the computation of the excess value underestimates the firm value of diversified firms when compared to focused ones. Additional tests are also consistent with the risk reduction hypothesis of corporate diversification (no discount for firms which are barely financed with debt, lower distress risk and lower equity volatility for diversified firms). Moreover, we show that ownership structure affects the diversification discount. We therefore conclude that the book value of debt bias is an important, but not the only explanation for the diversification discount.

The remainder of the study is organized as follows. In Section 2, we describe the data set, the identification of focused and diversified firms, and the excess value measure. In Section 3, we outline the precise procedure of how we estimate market values of debt. Furthermore, we assess the quality of our estimation by comparing market value of debt estimates with actual bond prices for a subset

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