“Wealth creation through corporate diversification – the bondholders’ perspective”

AUTHORS	Jan Mammen https://orcid.org/0000-0001-6174-1919 https://publons.com/researcher/AAK-5390-2021

ARTICLE INFO	Jan Mammen (2020). Wealth creation through corporate diversification – the bondholders’ perspective. *Investment Management and Financial Innovations*, *17*(4), 94-101. doi:10.21511/imfi.17(4).2020.09
DOI	http://dx.doi.org/10.21511/imfi.17(4).2020.09
RELEASED ON	Tuesday, 10 November 2020
RECEIVED ON	Monday, 28 September 2020
ACCEPTED ON	Wednesday, 28 October 2020

JOURNAL	"Investment Management and Financial Innovations"
ISSN PRINT	1810-4967
ISSN ONLINE	1812-9358
PUBLISHER	LLC “Consulting Publishing Company “Business Perspectives”
FOUNDER	LLC “Consulting Publishing Company “Business Perspectives”

NUMBER OF REFERENCES	NUMBER OF FIGURES	NUMBER OF TABLES
29	0	3

BUSINESS PERSPECTIVES

LLC "CPC "Business Perspectives"
Hryhorii Skovoroda lane, 10,
Sumy, 40022, Ukraine

www.businessperspectives.org

Jan Mammen (Germany)

WEALTH CREATION THROUGH CORPORATE DIVERSIFICATION – THE BONDHOLDERS' PERSPECTIVE

Abstract

The influence of corporate diversification on firm value is an important field in strategy research. Studies in strategic management and finance research have analyzed value creation through product and geographic diversification from a shareholder's perspective. This study completes this picture by analyzing the bondholders' perspective. It is suggested that product diversification creates value for bondholders, while geographic diversification destroys bondholder value. The hypotheses are tested on a sample of S&P 1,200 firms in 2001–2011 using a fixed-effects panel model. Drawing on prior research, bondholder value creation is measured using the Merton model. The empirical results support the hypothesis that bondholders gain value through product diversification but lose value through geographic diversification. Considering prior research results, these results show that product diversification is preferable for bondholders, while geographic diversification is preferable from a shareholder's perspective. The opposite effects of both diversification strategies on shareholders, respectively, bondholders offer an important new perspective on corporate diversification. The results show that firms with a high level of corporate debt should struggle to justify a strategy involving geographic dispersion of activities and support a more diversified product portfolio strategy. This study also offers several avenues for investigating the bondholder's perspective on corporate diversification in more detail.

Keywords bondholder value, conglomerate discount, firm risk, Merton model, geographic diversification, product diversification

JEL Classification L30, G32

Received on: 28th of September, 2020
Accepted on: 28th of October, 2020
Published on: 10th of November, 2020

Jan Mammen, Ph.D., Postdoctoral researcher, University of Erlangen-Nuremberg, Germany.

Conflict of interest statement:
Author(s) reported no conflict of interest

INTRODUCTION

Wealth creation through product and geographic diversification has received considerable attention in strategic management and finance research (Denis et al., 2002; Geringer et al., 1989; Geringer et al., 2000; Lu & Beamish, 2004; Palich et al., 2000). Product diversification is widely assumed to have a value-destroying effect (Amit & Livnat, 1989; Berger & Ofek, 1995, 1999; Lubatkin & Rogers, 1989). Regarding the results for geographic diversification, the results are mixed. Studying a sample of US and European firms, Geringer et al. (1989) did not find distinct differences in performance patterns among firms with different internationalization levels. Denis et al. (2002) found a comparable conglomerate discount for geographically diversified firms, as prior studies for product diversified firms did (Berger & Ofek, 1995). Finally, Mammen et al. (2019) found product diversification to decrease firm risk, while geographic diversification increases firm risk.

However, all of these studies have exclusively focused on the impact of the product or geographic diversification from a shareholder's perspective. Banks and debtors as an interest group have largely been ignored. This focus is insofar surprising as debt is a critical source of financing for firms. Firms borrow a higher amount of money from banks than they raise through equity and public debt together (Drucker &

http://dx.doi.org/10.21511/imfi.17(4).2020.09

Puri, 2005; Ferreira & Matos, 2012). Additionally, studies in finance research analyzing wealth creation through product diversification have shown that the conglomeration discount can be attributed to an increase in bondholder value at the expense of shareholder value (Glaser & Müller, 2010; Mansi & Reeb, 2002).

The missing consideration of bondholders is surprising as bondholders might value diversified firms differently than shareholders. Depending on a firm's equity-to-debt ratio bondholders can play an important role in shaping a firm's strategy. Focusing exclusively on shareholders might result in an incomplete picture. This study suggests a value destroying effect for bondholders from geographic diversification, but a value increasing effect from product diversification. This would imply that highly indebted companies will struggle to justify diversification into new geographic markets, but should not face problems to justify product diversification moves towards their bondholders

To complete the picture of corporate diversification, this study focuses thus on analyzing the value effects of product and geographic diversification from the bondholders' perspective.

1. LITERATURE REVIEW

Several papers have shown a risk-reducing effect of corporate diversification (Bettis & Mahajan, 1985; Lubatkin & Chatterjee, 1994; Mammen et al., 2019). In contrast to shareholders, bondholders have a capped pay-off function. This implies that bondholders benefit from risk-reducing strategies but not from risk-increasing strategies to the same amount as shareholders. Expanding across industries provides a firm with several options to reduce risk and decrease the likelihood of bankruptcy. If it faces a market decline in one industry, it can shift resources to an industry with a more favorable environment (Mammen et al., 2019).

Diversifying into related product markets also increases the potential for higher market power. Higher market power allows a firm to pass higher factor costs on its suppliers or customers rather than bearing them itself (Capps et al., 2003). Besides limiting their exposure to fluctuation in material and interest costs, higher market power also offers the chance to establish higher product prices (Chatterjee & Lubatkin, 1990) and thus to pass on higher costs on consumers.

Early research stressed the positive effects of geographic diversification on firm performance. Kim et al. (1993) argue that geographic diversification, similar to product diversification, offers the opportunity to leverage strategic resources and gain economies of scope across markets (Grant, 1987). Simultaneously, firms can reduce their dependency on factors such as a country's interest rate, wage rate, and commodity and raw material prices, as the firm gains the opportunity to shift production between different geographic locations (Kim et al., 1993; Tallman & Li, 1996). This flexibility in relocating production to geographic regions with lower input prices ensures the firm against detrimental movements of the real exchange rate (Kogut & Kulatilaka, 1994; Miller & Reuer, 1998). Tallmann and Li (1996) further outline that geographically diversified firms can avoid aggressive competition in one market by focusing on other markets. From a finance perspective, it has been argued that investors can use globally diversified firms as a vehicle to diversify their investment portfolio at a lower cost than they could individually (Denis et al., 2002).

However, the challenges associated with geographic diversification have also been stressed. Particularly, geographically diversified firms' managerial complexity has been stressed (Hitt et al., 1997; Carpenter & Sanders, 2004). This complexity can cause inefficient resource allocation between the different markets and might cause a missing long-term focus.

2. AIM AND HYPOTHESES

This study analyzes how product and geographic diversification affect a firm's bondholder value.

As outlined earlier, bondholders have a capped pay-off function, and the risk-reducing effects of

product diversification should ceteris paribus reduce the potential of losses and thus decrease the risk of bankruptcy. Therefore, it is suggested that a positive relationship between product diversification and bondholder value exists.

H1: There is a positive relationship between product diversification and bondholder value.

Geographic diversification offers the potential for extreme positive and negative performance. As shareholders have a symmetric pay-off function after the firm's debt obligations are fulfilled, they might benefit from geographic diversification. However, bondholders, which have a capped pay-off function, will only be exposed to a higher risk of debt default. Therefore, the bondholder value will be negatively influenced by geographic diversification.

H2: There is a negative relationship between geographic diversification and bondholder value.

3. RESEARCH METHODOLOGY

3.1. Sample

To test the hypotheses, a dataset of all S&P 1,200 listed firms from 2001 to 2011 is used. The period was chosen for two reasons:

1) the time window includes both periods of economic up and downturns;

2) given the continuous restructuring of geographic segments within firms, a longer period might have introduced too much noise in the measure of geographic diversification.

To avoid a survivorship bias, all firms are included, which have been listed in the index at least once in the analysis period using the DATASTREAM index list. Segment and accounting data were gathered from COMPUSTAT for all these firms. Like Glaser and Müller (2010), all financial firms are excluded, as their balance data-sheet is not comparable to those of non-financial firms. Therefore, all firms with the primary SIC codes between 6000 and 6999 are excluded from the analysis. However, in robustness check outlined further, the empirical results' stability is tested if these firms are included in the dataset.

3.2. Dependent variable

3.2.1. Bondholder value

Bondholder value is measured by calculating the ratio of the debt's market value to the book value of debt. To calculate the market value of debt, the bond pricing model developed by Merton (1974) was used. The Merton model states that the equity value can be assessed with the standard Black-Scholes call option formula:

$$E_t = A_t\Phi(d_1) - Le^{-r(T-t)}\Phi(d_2),$$

where $d_2 = d_1 - \sigma\sqrt{T-t}$, E_t – market value of equity, A_t – market value of assets (total firm value), r – risk-free rate, σ^2 – asset volatility, T – maturity, L – face value of debt.

While the market value of equity is directly observable for public firms, the firm's total value must be inferred. The market value of debt can then be calculated as the difference between the firm's total value (total market value of assets) minus the market value of equity. Subsequently, the ratio of the market value of debt to the book value of debt is calculated to measure bondholder value. It is important to notice that this ratio cannot be higher than 1, as the bank will not receive more than the total amount of its loan. The only exception can occur in a situation with negative risk-free rates. The Merton model involves the solution of a system of non-linear equations, which can be solved numerically by an iterative approach. The first step is to calculate an initial value for the asset volatility. Like prior studies, daily share returns are used to calculate the initial value (Glaser & Müller, 2010; Vassalou & Xing, 2004). In the second step, the forecast horizon and the face value of debt have to be determined. In line with prior research, the book value of a firm's debt and a one-year time horizon (Glaser & Müller, 2010; Vassalou & Xing, 2004) are used.

3.3. Independent variables

3.3.1. Geographic diversification

Geographic diversification is measured as the entropy measure of regional sales. Each reported geographic segment was classified into one of five geographic regions (Africa, North America,

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South America, Asia/Pacific, and Europe). Due to the reporting standards, a finer-grained classification was not possible. As the naming of geographic segments varies, only those firm-year observations were kept for which at least 75% of the total reported sales could be classified unambiguously.

The entropy measure is calculated as

$$\sum_{i=1}^{5} P_i \ln\left(1/P_i\right),$$

where P_i represents the percentage of sales in region *i*. The entropy measure thus captures the number of regions in which the firm operates and the proportion of sales in each region.

3.3.2. Product diversification

Product diversification is calculated using the entropy measure (Hitt et al., 1997; Palepu, 1985). This measure accounts for the number of industry segments and the proportion of a segment's sales.

3.4. Controls

Several factors that might influence a firm's shareholder and bondholder value are included as control variables. First, firm performance measured as earnings before interest and taxes (EBIT) over total assets is included. Second, firm leverage is accounted for by including the ratio of debt to equity. Third, R&D intensity is included. For R&D investments, the approach of Benner and Ranganathan (2012) is followed, and missing R&D observations are set to zero. A dummy variable assuming the value 1 for these observations is included in the models. Fourth, firm size is controlled for by including the natural logarithm of total assets. Fifth, by including the ratio of operating cash flow to total assets in the models, it is accounted for liquidity. Finally, all models include calendar year dummies to control for period-specific effects.

3.5. Econometric approach

A fixed-effects panel regression is used for testing the hypothesis. To test the applicability of a random-effects model, a Hausman test was conducted, which rejected the applicability of a random-effects model ($p < 0.05$). However, testing the hypothesis with a random-effects model, similar results were found. All independent and control variables were lagged by one period.

4. RESULTS

Table 1 reports mean, standard deviations, and pairwise correlations. The lack of very strong correlations indicates that multi-collinearity does not appear to be a problem in the sample. While there is no significant correlation between bondholder value and geographic diversification, the low but significant correlation between bondholder value and product diversification provides initial support for hypothesis 1.

Table 2 reports the results of the fixed and random effects regression models. Firm performance and R&D intensity both positively and significantly affect bondholder value, while leverage has a

Table 1. Descriptive statistics and correlations

Variables	Mean	S.D.	Min	Max	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) Bondholder value	0.912	0.122	0.029	1.000	1.00								
(2) Geographic diversification	0.311	0.383	0.000	1.482	0.02	1.00							
(3) Product diversification	0.330	0.425	0.000	2.086	0.05*	0.09*	1.00						
(4) Firm performance	0.097	0.078	–0.990	0.909	0.20*	–0.01	–0.03*	1.00					
(5) Leverage	0.527	0.168	0.052	0.981	–0.11*	–0.09*	0.20*	–0.14*	1.00				
(6) Firm size	7.722	1.463	4.682	13.587	0.09*	0.11*	0.29*	0.04*	0.41*	1.00			
(7) R&D intensity	0.055	1.120	0.000	81.006	–0.00	0.00	–0.02*	–0.11*	–0.01	–0.03*	1.00		
(8) Liquidity	0.105	0.071	–0.690	0.828	0.13*	–0.03*	–0.10*	0.55*	–0.19*	0.01	–0.11*	1.00	
(9) Dummy R&D correction	0.396	0.489	0.000	1.000	–0.05*	–0.26*	–0.04*	–0.04*	0.17*	0.09*	–0.04*	–0.02	1.00

Note: $p < 0.05$.

significant negative effect. The F-statistics for the fixed-effects models and the Wald statistic for the random-effect models are highly significant.

Product diversification has a positive and weakly significant ($p < 0.1$) effect on bondholder value in Model 2 and a positive and strongly significant effect ($p < 0.001$) in Model 5. These results support *H1*. Geographic diversification has a negative and significant effect ($p < 0.05$) on bondholder value in Model 3 and a negative and weakly significant effect ($p < 0.1$) in Model 6, supporting *H2*. Overall, both the fixed-effects model and the random-effects model support both hypotheses.

4.1. Robustness check including the financial industry

As a robustness check, the models were recalculated, including firms from the financial industry. The results are reported in Table 3. While the effect of product diversification remains robust in the increased sample, the negative relationship between geographic diversification and bondholder value becomes less significant. Furthermore, the R^2 within slightly decreases when geographic diversification is added in Model 3. This suggests that for the sample, including firms from the financial industry, geographic diversification does not increase the explanatory power to a great extent.

5. DISCUSSION

This study supports the hypothesis that product diversification increases bondholder value, while geographic diversification destroys it. Considering prior research on corporate diversification, these results strengthen the idea that geographic diversification can offer both the potential for extreme positive and negative performance fluctuations, i.e., a high risk-return profile. The positive performance implications have been stressed in studies by Kim et al. (1993) who argue that geographic diversification, similar to product diversification, offers the opportunity to leverage strategic resources and gain economies of scope across markets. Their argument has been supported by Kim et al. (1993) and Tallman and Li (1996) who suggest that geographically diversified firms can reduce their dependence on wage rates and other factor costs. The negative impli-

Table 2. Regression results from fixed and random effects regression models

Variables	FE models			RE models		
	(1)	(2)	(3)	(4)	(5)	(6)
Firm performance	0.235*** (0.04)	0.236*** (0.04)	0.236*** (0.04)	0.278*** (0.03)	0.278*** (0.03)	0.277*** (0.03)
Leverage	−0.110*** (0.02)	−0.112*** (0.02)	−0.112*** (0.02)	−0.116*** (0.01)	−0.118*** (0.01)	−0.120*** (0.01)
Firm size	0.001 (0.01)	−0.000 (0.01)	0.001 (0.01)	0.011*** (0.00)	0.010*** (0.00)	0.010*** (0.00)
R&D intensity	0.001*** (0.00)	0.001*** (0.00)	0.001*** (0.00)	0.001*** (0.00)	0.001*** (0.00)	0.001*** (0.00)
Liquidity	0.010 (0.04)	0.011 (0.04)	0.011 (0.04)	0.001 (0.03)	0.004 (0.03)	0.003 (0.03)
Dummy R&D correction	0.005 (0.02)	0.005 (0.02)	0.006 (0.02)	−0.009* (0.00)	−0.008* (0.00)	−0.010* (0.00)
Product diversification	–	0.019+ (0.01)	0.018+ (0.01)	–	0.013*** (0.00)	0.013*** (0.00)
Geographic diversification	–		−0.026* (0.01)	–	–	−0.009+ (0.01)
N	7,638	7,638	7,638	7,638	7,638	7,638
Firms	1,314	1,314	1,314	1,314	1,314	1,314
F	129.588***	122.536***	115.606***	–	–	–
Chi^2				2,401.266***	2,419.022***	2,416.106***
R^2 (overall)	0.246	0.247	0.239	0.266	0.268	0.268
R^2 (within)	0.279	0.280	0.281	0.278	0.278	0.279

*Note: + p < 0.1, * p < 005, ** p < 0.01, *** p < 0.001.*

http://dx.doi.org/10.21511/imfi.17(4).2020.09

Table 3. Regression results from fixed- and random-effects regression models including firms with primary SIC Codes between 6000 and 6999

Variables	FE models			RE models		
	(1)	(2)	(3)	(4)	(5)	(6)
Firm performance	0.265*** (0.04)	0.267*** (0.04)	0.266*** (0.04)	0.309*** (0.04)	0.308*** (0.04)	0.308*** (0.04)
Leverage	−0.123*** (0.02)	−0.125*** (0.02)	−0.125*** (0.02)	−0.110*** (0.01)	−0.112*** (0.01)	−0.113*** (0.01)
Firm size	0.004 (0.01)	0.003 (0.01)	0.003 (0.01)	0.011*** (0.00)	0.010*** (0.00)	0.010*** (0.00)
R&D intensity	0.001*** (0.00)	0.001*** (0.00)	0.001*** (0.00)	0.001*** (0.00)	0.001*** (0.00)	0.001*** (0.00)
Liquidity	−0.017 (0.04)	−0.017 (0.04)	−0.017 (0.04)	−0.023 (0.03)	−0.021 (0.03)	−0.021 (0.03)
Dummy R&D correction	0.003 (0.01)	0.004 (0.01)	0.004 (0.01)	−0.006 (0.00)	−0.005 (0.00)	−0.006 (0.00)
Product diversification	–	0.022* (0.01)	0.021* (0.01)	–	0.015*** (0.00)	0.015*** (0.00)
Geographic diversification	–	–	−0.018+ (0.01)	–	–	−0.005 (0.00)
N	8,591	8,591	8,591	8,591	8,591	8,591
Firms	1,469	1,469	1,469	1,469	1,469	1,469
F	150.222***	141.951***	134.230***	–	–	–
Chi^2	–	–	–	2,772.606***	2,796.969***	2,796.450***
R^2 (overall)	0.260	0.262	0.259	0.272	0.273	0.273
R^2 (within)	0.299	0.300	0.300	0.298	0.299	0.299

Note: + p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001.

cations of geographic diversification have been stressed by Hitt et al. (1997) and Caprpenter and Sanders (2004) who emphasized the coordination effort and the high governance costs of geographically diversified firms.

While higher performance fluctuations positively impact shareholders, bondholders do not participate from the upside potential. In contrast, product diversification shows a risk decreasing effect and thus provides less downside potential for bondholders. The positive effect of product diversification on bondholder value in the empirical analysis supports this idea.

Overall, the effect of product diversification is more significant compared to the effect of geographic diversification. This suggests a finer-grained analysis of geographic diversification. Future research might, for instance, differentiate into related and unrelated geographic diversification to further differentiate the effect. Potentially diversification in culturally more distant countries could increase coordination and governance costs even more strongly than expansion in culturally less distant countries.

Overall, the results can be seen as the first step to evaluate corporate diversification from a bondholder's perspective.

CONCLUSION

In this paper, the influence of product and geographic diversification on bondholder value is examined. Prior research is expanded by investigating value creation from the bondholder perspective, representing the most important financier for most firms.

Specifically, the results indicate that product diversification increases bondholder value, while geographic diversification decreases bondholder value. This finding suggests that firms expanding their activities into different geographic markets trade shareholder value for bondholder value, while the overall wealth creation is neutral. One explanation for the decrease in bondholder value is the risk-re-

turn profile of geographic diversification. Geographic diversification offers the potential for increased performance but is also accompanied by greater risk. Those risks offer the potential for shareholders, but not the bondholders of a firm. This implies that loans should become more expensive as geographic diversification increases.

Furthermore, the findings suggest that firms with a high level of corporate debt should struggle to justify geographic diversification strategy but receive support for a strategy of product diversification. To test this implication, the next step would be to test the implication of the debt-to-equity ratio for new market entries.

This study collectively contributes to previous research on the product and geographic diversification by providing a complete picture of the wealth effects both the bondholder and shareholder perspective are accounted for. The findings present a complete understanding of the performance effects of geographic diversification.

AUTHOR CONTRIBUTIONS

Conceptualization: Jan Mammen.
Data curation: Jan Mammen.
Investigation: Jan Mammen.
Methodology: Jan Mammen.
Validation: Jan Mammen.
Visualization: Jan Mammen.
Writing – original draft: Jan Mammen.
Writing – review & editing: Jan Mammen.

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