

# Conglomerates on the rise again? The worldwide impact of the 2008-2009 financial crisis on the diversification discount

Christin Rudolph\* and Bernhard Schwetzler

HHL – Leipzig Graduate School of Management, Germany

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## Abstract

We investigate how the 2008-2009 financial crisis affected the conglomerate discount in different regions of the world, using a sample of more than 65,000 firm-year observations from developed Asia Pacific, the British Isles, Continental Europe, and North America. Hence, we extend the U.S.-based study by Kuppuswamy and Villalonga (2010) to a global scale, incorporating the role of countries' institutional settings. Kuppuswamy and Villalonga (2010) find that the discount on conglomerates fell significantly in the wake of the recent financial meltdown. We show that the effect of the financial crisis upon the discount depends on the level of capital market maturity and the legal environment: regression analyses document a significantly decreasing discount for developed Asia Pacific, the British Isles, and North America; however, for Continental Europe - the region possessing the least developed capital markets and lowest investor protection - the impact of the credit crunch upon the relative value of diversified firms is insignificant. Thus, the U.S.-based results of Kuppuswamy and Villalonga (2010) cannot be easily transferred to other regions.

*JEL classification:* G31, G32, G34

*Key words:* conglomerate discount · capital market development · financial crisis

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\*Corresponding author; email: christin.rudolph@hhl.de.

# 1 Introduction

In 2008-2009, the world experienced a financial crisis of historic proportions. Induced by the burst of the U.S. housing bubble in 2007, a vicious circle of asset price deflation, margin calls, fire sales, and deleveraging resulted in a worldwide systemic banking failure.<sup>1</sup> While dramatic and unfortunate, the recent global financial meltdown serves as a natural experiment for researchers to study the impact of a credit-constrained environment on firm performance.

As such, it provides the opportunity to shed additional light on factors influencing conglomerate valuation. The question of whether corporate diversification harms or creates shareholder wealth, thus whether conglomerates trade at a discount or premium compared to standalones, has intensely been discussed over the last four decades. Various researchers analyze this question by relating the relative costs and benefits of conglomerates' internal capital markets to external capital markets.<sup>2</sup> The significant drop in available external funding caused by the financial crisis, hence, allows for a re-examination of potential strengths and weaknesses of diversified firms.

So far, Kuppuswamy and Villalonga (2010) provide the only work relating the crisis to the literature on the conglomerate discount.<sup>3</sup> Using quarterly U.S. data covering the period from Q1 2005 to Q4 2009, they investigate whether the relative value of diversified and standalone firms changed in the wake of the crisis. They find that the discount on diversified firms fell significantly during this period, suggesting that the change was caused by two effects: the "more money" effect arising from the debt coinsurance feature of conglomerates, and the "smarter money" effect stemming from increased internal capital market efficiency. However, transferability of these U.S.-based findings may be limited due to the different financial and legal contexts across world geographic regions.

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<sup>1</sup>Detailed analyses of the causes and consequences of the financial crisis are provided by e.g. Acharya et al. (2009), Dell'Ariccia et al. (2008), Gorton (2009), Greenlaw et al. (2008), Keys et al. (2010), Mian and Sufi (2009).

<sup>2</sup>See e.g. Shin and Stulz (1998), Rajan et al. (2000), Matsusaka and Nanda (2002), Maksimovic and Phillips (2002), Ahn and Denis (2004).

<sup>3</sup>To the best of our knowledge, no other paper analyzes the real effects of the 2008-2009 financial crisis on the corporate sector, directly differentiating between conglomerates and standalone firms. Various studies document the effects on stock price development, external borrowing, investment behavior, and cash holdings (e.g. Almeida et al. (2009), Campello et al. (2010a, 2010b), Duchin et al. (2010), Ivashina and Scharfstein (2010a, 2010b), Tong and Wei (2008)). However, they all focus on firms in general. Hovakimian (2011) and Yan et al. (2010) analyze, amongst others, whether internal capital market efficiency changes during recession periods. Both find that conglomerates improve the efficiency of internal resource allocation in times of tightened external capital markets. However, they do not draw inferences about the diversification discount and do not include the 2008-2009 financial crisis.

This paper addresses the question how the late-2000s financial breakdown affected the conglomerate discount in different regions of the world. Hence, it builds on the study by Kuppuswamy and Villalonga (2010), extending it to a global scale. Our sample comprises more than 65,000 firm-year observations from developed Asia Pacific, the British Isles, Continental Europe, and North America, covering the period from 1998 to 2009. We hypothesize that the effect on the discount caused by the financial crisis varies across regions and that these differences can be explained by the degree of capital market development and legal investor protection. Fauver et al. (2003) provide evidence for a negative relation between the value of diversification and capital market maturity: significant conglomerate discounts are found among countries with well-developed markets, whereas no discount exists in countries with less developed markets. They further show that the value of diversification also depends upon a country's legal context: countries with an English legal system (as opposed to the French, German, or Scandinavian system) provide investors with the strongest legal protection; the higher the protection of investors, the better the access to low-cost external capital and the lower the value of an internal capital market. Consequently, we argue that in countries with less mature capital markets and fewer investor rights, i.e. where raising external capital is more costly and difficult even during non-recession periods, firms should not be as strongly affected by the credit crunch as in countries with better developed capital markets and advanced investor protection. Hence, during a recession, the availability of a financing alternative in the form of an internal capital market (i.e. being diversified) should be less value-increasing in these countries as well.

We use four indicators to capture the regions' level of capital market maturity: GNI per capita (in US\$), market capitalization of listed companies as % of GDP, total value of stocks traded as % of GDP, and listed domestic companies to population. Legal investor protection is measured on the basis of the anti-director rights indices established by La Porta et al. (1997, 1998) and Djankov et al. (2008). These economic and legal indicators show that in Continental Europe capital markets are least developed and investor rights are least pronounced. According to our hypothesis, the positive impact of the financial crisis upon the value of diversification should thus be smallest in Continental Europe.

We perform regression analyses controlling for firm fixed effects and document statistically significant conglomerate discounts for Asia Pacific (-6.7%), the British Isles (-10.4%), and North America (-5.3%) prior to the recession; for Continental Europe, the diversification dummy is not significantly different from zero. During

the financial crisis, the discount decreases for Asia Pacific by 10.9%, the British Isles by 5.8%, and North America by 4.7%, all estimates being significant on a 5% level. In case of the Asian Pacific region, the crisis even seems to turn the conglomerate discount into a premium. For Continental Europe, however, the interaction between diversification dummy and crisis indicator is close to zero and insignificant. Thus, we conclude that our findings support our hypothesis.

We contribute to the literature in several ways. First, our paper is the first to globally investigate the impact of the 2008-2009 financial crisis on the relative value of conglomerates and standalones. Hence, we contribute to the ongoing discussion on the real effects of the crisis and provide additional evidence on factors influencing the relative costs and benefits of diversified firms. We thereby complement the study by Kuppuswamy and Villalonga (2010), shedding light on the role of capital market development and investor protection. Second, our analysis is based on an amended version of the Berger and Ofek (1995) model, relying on 1) geometric mean aggregated industry multipliers instead of arithmetic mean or median aggregated ones and 2) enterprise value-based excess values instead of firm value-based ones. Rudolph and Schwetzler (2011) find that these two modifications significantly increase the quality of regression results.

The paper is organized as follows. In Section 2, we describe the sample selection process and discuss key sample characteristics. We develop our research hypothesis in Section 3. Section 4 introduces our research methodology and examines the impact of the 2008-2009 financial crisis on conglomerate discounts across different geographical regions. Section 5 concludes.

## 2 Sample selection and description

We gather a sample of publicly traded firms from four different regions, namely developed Asia Pacific, the British Isles, Continental Europe, and North America, over a 12-year period from 1998 to 2009. Capital market and economic data are collected from Datastream and balance sheet information from Worldscope databases. Our analyses are based on regions rather than countries, as (in most cases) firm-year observations on the national level are rather low, thus not allowing for reliable regression results. Following previous studies, we exclude firms with segments in the financial services sector (SIC 6000 - 6999) from the sample. We further remove firms with non-classifiable segments (SIC 9999). To avoid distorted valuation multipliers, only firms with total sales of at least 20 million US\$ are considered; small firms usually trade at a discount for low liquidity (see Loderer

and Roth (2005)). Further, firm-years with insufficient financial information<sup>4</sup> and faulty sales figures<sup>5</sup> are excluded. We base our analyses exclusively on sales, as data on segment assets and profitability are very sparse across all regions. The screening procedure leaves us with an international sample of 68,330 firm-year observations. Table 1 gives a detailed overview of the various screening steps and lists the respective number of excluded firm-year observations per step.

*Please insert Table 1 approximately here*

Firms are defined as standalones if they report sales in only one segment or if the most important segment accounts for more than 90% of their total sales. This procedure avoids classifying firms as a conglomerate, although they are active in mainly one segment with only minor operations in others. Correspondingly, firms are considered conglomerates when they report sales in two or more segments, with the most important segment accounting for less than 90% of total sales. Conglomerate definition is based on the Fama and French (1997) classification system, which links existing 4-digit SIC (Standard Industrial Classification) groups to 48 industry groups. We choose the modified version by Fama and French (1997), as it allows for a better manageable number of industries and accounts for common risk characteristics within them. Further, Weiner (2005) shows that when relying on the Worldscope database, the Fama and French (1997) classification system provides the best correspondence<sup>6</sup> with the widely used Compustat SIC system (e.g. used by Berger and Ofek (1995), Villalonga (2004a), Kuppuswamy and Villalonga (2010)). To ensure the comparability and robustness of our results, we repeat our analyses applying 2-digit Worldscope SIC codes.

Table 2 lists the considered countries per region, illustrating the distribution of firm-years and the split into conglomerate and standalone observations among them (based on the Fama and French (1997) classification).

*Please insert Table 2 approximately here*

Our sample comprises 20,621 observations from developed Asia Pacific (Australia, Japan, Singapore, South Korea), 8,154 from the British Isles (Ireland, United Kingdom), 14,780 from Continental Europe (Austria, Belgium, Finland, France,

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<sup>4</sup>This includes all observations with missing information on market capitalization, total debt, cash and short-term investments, minority interest (balance sheet), total sales, and segment sales.

<sup>5</sup>This includes all observations with negative total sales or segment sales, total sales of zero, and where the sum of segment sales is less than 99% or greater than 101% of total sales.

<sup>6</sup>Correspondance between classification systems refers to their structural similarity as well as their similarity in distributing firms over industries.

Germany, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland), and 24,775 from North America (Canada, United States). The percentage of firms defined as conglomerates varies significantly across regions. We record a much lower average fraction of diversified firms in North America (10.8%) compared to the other regions (18.2% to 22.2%). Fauver et al. (2003) find that net benefits of corporate diversification depend on the level of capital market development and investor protection; hence, the varying percentage of diversified firms might be due to different stages of market maturity and legal systems.

Table 3 provides further descriptive statistics on conglomerates and standalone firms per region.<sup>7</sup>

*Please insert Table 3 approximately here*

The difference in the average number of segments reported by diversified firms is only marginal (between 2.293 and 2.433). Comparisons across all firms indicate high variations in profitability and cash holdings. More precisely, Asian Pacific firms, with a median EBIT to sales ratio of 4.4%, seem to be less profitable compared to firms in other regions, reporting ratios between 6.1% and 7.4%. In addition, firms from the Asian Pacific region report much higher median cash to sales ratios (12.1%), particularly compared to firms from the British Isles (5.8%).

Comparing the differences between diversified and standalone firms, we find that median market to book ratios, reflecting a firm's growth opportunities, are higher for standalones across all regions. For Europe (both Continental and British Isles) and North America, differences in size, leverage, and cash holdings are as expected. Conglomerates among European and North American firms are significantly larger than standalones.<sup>8</sup> They also carry significantly more debt and seem to have lower cash reserves. In contrast to these findings (and our expectations), Asian Pacific conglomerates are significantly smaller than standalones and the debt and cash holdings of the two groups are quite similar. With respect to profitability, we do not find significant differences between diversified and standalone firms in Asia Pacific and North America. In Continental Europe, however, the difference in medians between the groups indicates that diversified firms are more profitable. The opposite holds true for diversified firms from the British Isles. Capital spending, measured as the ratio of capital expenditures to sales, is marginally but significantly higher for conglomerates in Europe and Asia Pacific.

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<sup>7</sup>Due to skewness in the distributions, we analyze medians rather than means.

<sup>8</sup>We define size as the natural logarithm of a firm's total assets in US\$.

In contrast, capital spending of North American conglomerates is slightly lower than for standalones. These summary statistics do not only highlight the differences in firm characteristics between conglomerates and standalones, but also indicate regional peculiarities.<sup>9</sup>

### 3 Research hypothesis and predicted results

The value of corporate diversification has comprehensively been investigated in literature. Various primarily U.S.-based studies provide significant evidence that, on average, diversified firms trade at a discount (e.g. Lang and Stulz (1994), Berger and Ofek (1995), Servaes (1996), Lins and Servaes (1999), Denis et al. (2002), Burch and Nanda (2003), Ammann et al. (2012)).<sup>10</sup> However, international studies by e.g. Fauver et al. (2003), Khanna and Palepu (2000a, 2000b), Khanna and Rivkin (2001), and Lee et al. (2008) reveal that the existence of a conglomerate discount (or premium) is dependent on a country's institutional context. Using a database of more than 8,000 companies from 35 countries, Fauver et al. (2003) examine the link between the value of corporate diversification and capital market development, integration, and legal systems. They hypothesize that diversification may be of limited value in developed economies where the institutional context even allows small, standalone firms to easily access capital. In contrast, it may be of more value in economies where firms find it more costly or impossible to raise external capital. Consistent with this hypothesis, they find a significant conglomerate discount among countries with well-developed, integrated capital markets, but no discount (and in some cases even a significant premium) in countries with segmented and less developed capital markets. With regard to the legal environment, the authors take into account evidence provided by La Porta et al. (1997, 1998), who document a link between a country's legal system and the level of protection given to investors. La Porta et al. (1997, 1998) differentiate between four different systems, English-common-law and French-, German-, and Scandinavian-civil-law. Based on their anti-director rights index (ADRI), capturing the extent

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<sup>9</sup>Overall, these descriptive results should be interpreted with caution, as we did not adjust for industry characteristics. Further, the predominance of some countries in terms of firm-year observations may partly influence the regional results.

<sup>10</sup>Some studies argue that the conglomerate discount exists, but is primarily attributable to factors other than diversification (e.g. Campa and Kedia (2002), Villalonga (2004a)). Others claim that the discount is solely an artifact of inappropriate measurement techniques (Villalonga (2004b)). Overall, the literature on the value of corporate diversification is wide and far from being unanimous. See Martin and Sayrak (2003) for a comprehensive review of the studies concerned with the diversification discount.

of a country's investor rights, they conclude that countries with an English legal system offer the strongest legal protection to capital providers, while the French system offers the least protection, with the German and Scandinavian law countries in the middle.<sup>11</sup> Building on these findings, Fauver et al. (2003) show that countries with French, German or Scandinavian legal systems have smaller (or even no) conglomerate discounts as opposed to countries with systems of English origin, arguing that a lower investor protection impairs the access to external capital, thereby increasing the benefits of an internal capital market and corporate diversification. Khanna and Palepu (2000a, 2000b), Khanna and Rivkin (2001), and Lee et al. (2008) provide similar evidence.<sup>12</sup> These international results suggest that U.S.-based studies, detecting a significant discount on diversification, are not to be generalized towards countries with different institutional settings.

We carry this idea further to the study of Kuppuswamy and Villalonga (2010). Examining the impact of the 2008-2009 financial meltdown upon the conglomerate discount, they argue that two factors have led to a relative increase of the value of diversification: on the one hand, internal capital markets served as an alternative funding source, partly substituting unavailable external funds; the scarcity of funds increased the efficiency of internal capital markets. On the other hand, the debt coinsurance feature of conglomerates allowed for a better access to credit markets. We argue that Kuppuswamy and Villalonga (2010)'s findings cannot simply be transferred across U.S. borders, as different levels of capital market development and investor rights protection yield different net benefits of diversified firms. More precisely, we suggest that regions, in which raising external capital is more costly and difficult even in non-crisis periods, should not be as strongly affected by the sudden credit crunch as regions possessing more developed capital markets and higher investor protection. As a consequence, during the financial crisis, the availability of a financing alternative in the form of an internal capital market should be more value-increasing to conglomerates in regions with better

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<sup>11</sup>The anti-director rights index (ADRI) is an index aggregating six types of investor rights: 1) One share - one vote, 2) Proxy by mail allowed, 3) Shares not blocked before meeting, 4) Cumulative voting or proportional representation, 5) Oppressed minorities mechanism, 6) Preemptive rights. For a detailed discussion of the ADRI refer to La Porta et al. (1997, 1998).

<sup>12</sup>Drawing on data between the 1980s and late-1990s from India, Chile and various other emerging markets, Khanna and Palepu (2000a, 2000b) and Khanna and Rivkin (2001) conclude that diversification may be more valuable in these markets compared to more developed economies. The recent study of Lee et al. (2008) also concentrates on emerging countries, analyzing the development of conglomerate valuation during the institutional transitions in South Korea between 1984 and 1996. It suggests a conglomerate premium in times of less developed external capital, product and labor markets, and shows that the premium declines and even turns into a discount when markets develop and organizational size as well as complexity increase.

developed markets and advanced investor rights than conglomerates in regions with less pronounced ones.

Hence, we hypothesize a positive relation between capital market development and the interaction of financial crisis and diversification, i.e. the less developed external capital markets, the smaller the positive effect on conglomerate valuation caused by the crisis. In addition, we expect a positive relation between the level of protection to capital providers and the interaction of financial crisis and diversification, i.e. the lower investor rights, the smaller the positive effect on conglomerate valuation caused by the crisis. Put differently: international studies, amongst others by Fauver et al. (2003) and Lee et al. (2008), do not find evidence of a conglomerate discount in economies with less developed markets and/or low investor rights; if a conglomerate discount does not exist ex ante, the impact of the financial crisis upon the discount should consequently be insignificant as well.

In order to compare the level of capital market maturity across our four regions, we refer to four commonly used economic measures, namely GNI per capita (in US\$), market capitalization of listed companies as % of GDP, total value of stocks traded as % of GDP, and listed domestic companies to population.

*Please insert Table 4 approximately here*

Table 4 exhibits annual results from 1998 to 2007, as well as the average over the period for each of the four indicators.<sup>13</sup> Country data are gathered from World Bank's WDI database; regional indicators correspond to the sum of population-weighted country indicators. Comparing the averages, we find that Continental European capital markets are the least developed among our four regions. GNI per capita corresponds to 27,733 US\$, compared to 28,973 US\$ in Asia Pacific, 30,988 US\$ in the British Isles, and 37,669 US\$ in North America. The ratios of market capitalization to GDP and total value of traded stocks to GDP are lowest for Continental Europe as well, closely followed by the Asian Pacific region. We also record a lower average of listed domestic companies to population (17.88 million) compared to the other regions (27.97 million to 37.65 million). Apart from Continental Europe, the indicators yield slightly ambiguous results. According to GNI per capita, market capitalization to GDP, and total value of traded stocks to GDP, the Asian Pacific region directly follows Continental Europe in terms of capital market development. However, the ratio of listed domestic companies to population is much higher for Asia Pacific (32.05 million) than for North America

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<sup>13</sup>We neglect the values of 2008 and 2009, as they are heavily influenced by the financial crisis. However, including the years 2008 and 2009 would still not alter the overall results.

(27.97 million). Overall, the British Isles and North America seem to have the most developed capital markets among all regions, followed by Asia Pacific and Continental Europe at the bottom of the league. Hence, we hypothesize the positive effect of the financial crisis to be highest upon the value of British and North American conglomerates and lowest upon Continental European conglomerates, with the Asian Pacific region in between.<sup>14</sup>

We further compare the legal context among our four regions, capitalizing on the analyses of La Porta et al. (1997, 1998) and Djankov et al. (2008); the latter study provides a revised version of the ADRI score. The higher the score, the stronger a country's investor protection.

*Please insert Table 5 approximately here*

Table 5 lists countries' legal systems and ADRI scores; in addition, it provides mean averaged ADRI scores per region. Australia, Canada, Ireland, Singapore, the United Kingdom, and the United States possess a legal system of English origin. In line with this, the mean averaged ADRI scores of the British Isles and North America are highest among the four regions (between 3.50 and 5.00), closely followed by developed Asia Pacific (3.00 to 4.50). In contrast, the Continental European countries possess French-, German- or Scandinavian-civil-law systems. Correspondingly, Continental Europe also exhibits the lowest mean averaged ADRI scores (between 1.58 and 3.17). Hence, our analysis of the regions' legal context adds to our hypothesis that the impact of the financial crisis upon the conglomerate discount should be smallest for Continental Europe.

## **4 The impact of the financial crisis on the conglomerate discount**

We begin this section by briefly presenting our research methodology for the excess value estimation. We then perform a univariate analysis of mean excess values of conglomerates and standalones per region, observing their development over

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<sup>14</sup>One reason for the Continental European region to display less developed capital markets is that corporations historically rely more on banks for their funding; this is especially true for Germany, being labeled as a bank-based economy. As effectively providing funds for firms being financially distressed is seen to be one of the benefits of a house-bank relation, firms in bank-based economies may in general not face deep funding cuts in credit crunch situations. This argument also adds to our hypothesis that the impact of the financial crisis on conglomerate discounts might be lower in Continental Europe. For the benefits of a housebank-relation in financial distress see e.g. Elsas/Krahnert (1998) and Rosenfeld (2007).

time and comparing crisis against non-crisis years. In a final step, we test the impact of the interaction between diversification and financial crisis on excess value, using multivariate ordinary least squares regressions and controlling for firm fixed effects. Several robustness tests are performed.

## 4.1 Research methodology

We base our analyses on a modified version of the excess value model proposed by Berger and Ofek (1995). Their approach compares a conglomerate's actual value against an imputed value, computed as the value of a matched portfolio of standalone firms; more precisely, excess value corresponds to the natural logarithm of the ratio of actual value to imputed value. A positive conglomerate excess value indicates that diversification increases the value of segments beyond that of their standalone counterparts. A negative excess value indicates that diversification reduces value. We hypothesize that the model is potentially biased in two ways.

First, as the methodology relies on firm values (market value of equity plus total debt) a potential distortion is caused by differences in corporate cash holdings between conglomerates and standalone firms. Duchin (2010) shows that, due to their active internal capital markets, conglomerates hold significantly less cash than standalones. As the standalone-based imputed value thus contains a comparably higher cash position, excess values relying on firm values may systematically underestimate conglomerate performance.<sup>15</sup> In order to avoid this cash distortion, we deduct cash and securities holdings from the firm value, thus applying excess values based on enterprise values (market value of equity plus net debt).

Second, the derivation of excess values might be biased by the choice of industry multiplier aggregation. Almost all studies calculating and analyzing conglomerate discounts rely on arithmetic mean or median aggregated standalone multipliers when computing imputed segment values. However, findings by Dittmann and Maug (2008) suggest that these averaging methods may distort excess values. They examine biases of four multiple aggregation methods - arithmetic mean, median, harmonic mean, and geometric mean - and their impact upon different error measures. For logarithmic errors, they find that the harmonic mean is biased downward, whereas the arithmetic mean is biased upward; median ag-

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<sup>15</sup>Note that comparing average cash positions of conglomerates and standalones will not give any information about the potential bias. Even if conglomerates, on average, seem to have similar or higher cash positions than standalone firms, this does not imply any assertion about cash distortion. If conglomerates are more active in industries with high average cash holdings, the imputed cash holdings may still be higher than the actual ones.

gregation also exhibits a small, statistically significant negative bias, while the geometric mean is unbiased. Thus, only geometric mean averaged industry multipliers reliably result in aggregated standalone excess values of zero, providing an undistorted benchmark for the calculation of conglomerate discounts.

In sum, we introduce two modifications to the original Berger and Ofek (1995) model: 1) Excess values are based on enterprise values instead of firm values. 2) Arithmetic mean and median averaged standalone multipliers are replaced by geometric mean averaged multipliers.<sup>16</sup>

We further depart from Berger and Ofek (1995) as our industry classification is based on Fama and French (1997), while they classify their industries according to SIC groupings.<sup>17</sup> Also, our aggregated industry multipliers consist of at least one standalone observation, while Berger and Ofek (1995) demand industry peer groups to consist of at least five standalone firms per year.<sup>18</sup>

## 4.2 Excess value analysis

Table 6 exhibits the development of mean excess values of conglomerates and standalones per geographical region over time. While Kuppuswamy and Villalonga (2010) are able to track the quarterly performance of firms from Q1 2005 to Q4 2009, we only have access to annual data. We apply a rollover technique, examining short periods of two consecutive years, in order to ensure a sufficient number of observations per time interval. Our analyses are exclusively based on sales multipliers due to the poor Worldscope coverage of assets and earnings on segment levels. In line with prior research, firm-year observations with imputed enterprise values greater than four or less than one-fourth times the actual value are excluded. This outlier cut-off procedure changes the entire multiplier distribution; as a result of the adjustment, geometric mean aggregation also produces mean excess values for standalones that slightly differ from zero. Hence, whether conglomerates trade at a discount or premium is best calculated by the difference in mean excess values between diversified and standalone firms; a negative difference implies a discount on diversification, while a positive difference implies a

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<sup>16</sup>See Rudolph and Schwetzler (2011) for a more detailed theoretical and empirical analysis of potential biases of the Berger and Ofek (1995) approach.

<sup>17</sup>However, we also repeat our analyses applying 2-digit Worldscope SIC codes in order to ensure the robustness of our results.

<sup>18</sup>Not all studies on conglomerate discounts set such high data requirements. The study of Lins and Servaes (1999) even allows for empty industries.

premium.<sup>19</sup>

*Please insert Table 6 approximately here*

Looking at developed Asia Pacific, Table 6 displays a significant negative difference between conglomerate and standalone excess values from 2000-2001 to 2007-2008 (ranging between -0.057 and -0.129). Comparing 2007-2008 and 2008-2009, the robust discount abruptly changes into an insignificant premium (0.017). We observe a similar development for the British Isles. From 2002-2003 to 2007-2008, the difference in excess values between diversified and standalone firms is significantly negative. Comparing 2007-2008 and 2008-2009, the discount declines substantially from -0.114 to -0.051, turning insignificant. For Continental Europe, we receive a different picture. Apart from 1998-1999, the difference in excess values between the two firm types remains insignificant, displaying positive and negative signs. There is neither evidence of a significant discount on diversification, nor a relevant impact of the financial crisis upon the discount. For North America, a steady decline of a negative difference between conglomerate and standalone excess values can be observed, turning insignificant from 2003-2004 onwards; the conglomerate discount seems to gradually disappear.

For Asia Pacific and the British Isles, our investigation of excess values over time indicates a significant positive change in the relative valuation of diversified firms during the crisis. With regard to North America and Continental Europe, the impact of the breakdown remains rather indefinite. The evolution of discounts per region over time is graphically depicted in Figure 1.

*Please insert Figure 1 approximately here*

In Table 7, we examine the difference in conglomerate and standalone excess values, contrasting non-crisis years (1998 to 2007) and crisis years (2008 to 2009).

*Please insert Table 7 approximately here*

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<sup>19</sup>Note that excess values of standalones by itself cannot be meaningfully interpreted. Empirically, mean standalone excess values different from zero may be caused by multiplier aggregation methods yielding biased results; as described earlier, Dittmann and Maug (2008) find the arithmetic mean, harmonic mean and median to distort logarithmic error measures. As our study relies on the fully unbiased geometric mean for multiplier aggregation, mean excess values of standalones deviating from zero can only be caused by the outlier cut-off procedure described above. Appendix A.1 illustrates the development of conglomerate and standalone mean excess values over time, skipping the outlier cut-off procedure; in this case, mean excess values of standalone firms always average out to zero.

We observe a positive change in the diversification discount from the non-crisis to crisis period in all four regions; however, the magnitude of the change varies substantially. The impact of the financial meltdown is largest in Asia Pacific (0.097), followed by North America (0.062) and the British Isles (0.030); in contrast, the crisis effect in Continental Europe is only marginal (0.003). These results again support our hypothesis that, of all our four regions, the 2008-2009 financial crisis had the lowest impact on Continental Europe, given its comparatively less developed capital markets and fewer investor rights. In contrast to our results in Table 6, we now find strong evidence that the credit crunch triggered a positive change in the value of diversification in North America.

Our univariate analysis provides a preliminary indication of how the financial crisis affected the diversification value in different regions. In the next subsection, we run multivariate OLS regressions, thereby controlling for firm fixed effects and other factors potentially influencing excess values.

### 4.3 Multivariate regression analysis

Following the procedure of Kuppuswamy and Villalonga (2010), we regress excess value on a diversification dummy, a crisis indicator, and the interaction between the two, along with several firm-specific control variables.

Interaction terms and inferences on them are especially sensitive to the number of observations used in the regression analysis. The reason for this is that standard errors of interaction terms tend to be large because interaction terms increase problems of multicollinearity. This is especially a problem if, as in our case, an interaction term is formed by multiplying two indicator variables, because the number of outcomes is limited there. The only possible remedy for this is using more information. As our firm-year observations on country level are rather low, we consequently rely on regional datasets instead (for a more detailed discussion on the use of multiplicative terms in regression analysis see Kam and Franzese (2007)).

As explained earlier, we compute excess values based on enterprise values and geometric mean aggregated industry multipliers, standing in contrast to Kuppuswamy and Villalonga (2010) and other prior literature analyzing the conglomerate discount. The diversification dummy is set equal to 1 if a firm is defined as conglomerate, thus, if a firm reports sales in two or more Fama-French segments, with the most important segment accounting for less than 90% of its total

sales. The crisis indicator equals 1 for the years 2008 and 2009.<sup>20</sup> The interaction between diversification dummy and crisis indicator measures how a change from non-crisis period to crisis period affects the excess value of diversified firms. Our control variables include size (measured as the logarithm of total assets), EBIT to sales, cash to sales, capital expenditures to sales, and debt to total assets. We further control for firm fixed effects in order to avoid that unobservable firm characteristics bias our regression estimates.<sup>21</sup> Reported significance levels are calculated using robust standard errors.

*Please insert Table 8 approximately here*

Table 8 presents the regression estimates per region. The coefficient of the diversification dummy is negative and highly significant for Asia Pacific (-6.7%), the British Isles (-10.4%), and North America (-5.3%), suggesting that in non-crisis years conglomerates trade at a discount compared to standalone firms. In contrast, the Continental European coefficient is close to zero and insignificant. Note that the coefficient for the crisis indicator cannot be meaningfully interpreted, as it only captures the effect of the crisis on standalone excess values. In our study design, coefficient estimates that differ from zero are result of the outlier adjustment proposed by Berger and Ofek (1995), eliminating firm-year observations with imputed enterprise values greater than four or less than one-fourth times the actual value. Omitting this outlier cut-off procedure would result in mean standalone excess values of zero for any (crisis and non-crisis) year; thus, the crisis indicator only measures effects caused by outlier correction. Looking at the interaction between diversification and the crisis, we document significantly positive coefficients for the Asian Pacific region (0.109 at 5% significance level), the British Isles (0.058 at 5% significance level), and North America (0.047 at 1% significance level), indicating that the conglomerate discount was reduced by

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<sup>20</sup>The availability of quarterly data allows Kuppaswamy and Villalonga (2010) to divide the sample period into Early Crisis (2007Q3-2008Q3), Late Crisis (2008Q4-2009Q1) and Post-Crisis (2009Q2-2009Q4); the period from 2005Q1-2007Q2 serves as baseline category. They find that the conglomerate discount was significantly reduced by 7% during the Early Crisis (i.e. the purely financial crisis period) and decreased even further by additional 2% during the Late Crisis (i.e. when the crisis spilled over to the demand side of the economy). For the Post Crisis, they do not document a reduction of the discount. Apart from crisis period dummies, Kuppaswamy and Villalonga (2010) further apply the TED spread, the spread of three-month commercial paper over treasury bills of the same maturity, and the Chicago Board Options Exchange Volatility Index (VIX) as alternative measures of the intensity of the crisis.

<sup>21</sup>In their recent U.S. study, Ammann et al. (2012) investigate the importance of accounting for firm fixed effects when estimating conglomerate discounts. They test for the presence of these effects using a robust version of the Hausman (1978) specification test, concluding that they indeed should be taken into account.

10.9%, 5.8%, and 4.7%, respectively, during crisis years. In case of the Asian Pacific region, the crisis even turned the conglomerate discount into a premium. For Continental Europe, the coefficient is slightly positive, but insignificant.

Hence, in general, the financial crisis had a positive impact upon the relative valuation of conglomerates all over the world. For all four regions, the coefficient of the interaction term is positive. The magnitude of this positive effect, however, is higher for regions with well-developed capital markets and stronger investor rights. Thus, these results support our hypothesis.

We perform several robustness checks; the results are displayed in table 9.

*Please insert Table 9 approximately here*

In Panel A, we repeat the regression from Table 8 relying on the Berger and Ofek (1995) excess value definition, predominantly used by prior studies on conglomerate discounts. Thus, excess values are based on firm values and median aggregated industry multipliers. The coefficient of the diversification dummy is again negative and highly significant for Asia Pacific, the British Isles, and North America, however, the discounts are constantly larger compared to our first regression model. This result can be explained with our cash distortion argument, mentioned in subsection 4.1: when using the firm value as value base, deriving imputed values for conglomerates based on standalones that have significantly higher cash positions distorts conglomerates' excess values. More precisely, the imputed cash value is higher than the actual conglomerate's cash value, resulting in a downward biased excess value and thus discount. In the case of Continental Europe, the cash bias even turns an insignificant discount into a significant one (-2.6% at a 10%-level). With regard to the financial crisis, we find a significantly decreasing discount for Asia Pacific, the British Isles, and North America, whereas the interaction between diversification and crisis is insignificant for Continental Europe. These results support our regression estimates from Table 8.

In Panel B and C, we replicate the two prior regressions using 2-digit Worldscope SIC codes instead of Fama and French (1997) industries for conglomerate classification. In total, our robustness checks confirm the findings of our base model.<sup>22</sup>

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<sup>22</sup>When using Worldscope SIC codes for industry classification, the interaction term's coefficient for the British Isles turns insignificant. We attribute this result to the lower number of observations, as interaction terms and inferences on them are very sensitive to the size of the dataset used in a regression analysis (for a more detailed discussion see Kam and Franzese (2007)).

Overall, excess value analyses and regression analyses both support our hypothesis on the relation between capital market development, legal systems and the interaction of financial crisis and diversification: the positive effect on the discount caused by the crisis decreases, as the maturity of capital markets and level of investor protection declines.<sup>23</sup>

## 5 Conclusion

Based on quarterly U.S. data, Kuppuswamy and Villalonga (2010) investigate whether diversification creates value in the presence of external financing constraints, making use of the 2008-2009 financial crisis as a natural experiment. Their results suggest that the conglomerate discount decreased in the wake of the recent financial meltdown. We argue that their U.S.-based findings cannot be easily transferred to other regions, hypothesizing that the positive effect on the discount caused by the crisis diminishes, the less developed capital markets and the fewer investor rights are.

Thus, we extend the analysis of Kuppuswamy and Villalonga (2010) to a global scale, incorporating the role of capital market maturity and investor protection. Our sample comprises more than 65,000 firm-year observations from developed Asia Pacific, the British Isles, Continental Europe, and North America, covering the period from 1998 to 2009. Our excess value estimation is based on a modified version of the common Berger and Ofek (1995) model, using enterprise values and geometric mean aggregated industry multipliers.

In order to measure the level of capital market development across our four regions, we refer to four common economic variables suggested by Fauver et al. (2003): GNI per capita (in US\$), market capitalization of listed companies as % of GDP, total value of traded stocks as % of GDP, and listed domestic companies to population. Legal investor protection is analyzed on the basis of the anti-director rights indices established by La Porta et al. (1997, 1998) and Djankov et al. (2008). The indicators show that in Continental Europe capital markets are least developed and investor rights are least pronounced. Hence, according to

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<sup>23</sup>We expected the impact of the credit crunch on diversification value to be highest for the British Isles and North America, followed by Asia Pacific and Continental Europe. However, univariate and multivariate analyses both show the most profound effect for Asia Pacific: while in case of the British Isles and North America, the diversification discount is only reduced during the crisis, it is turned into a premium in the Asian Pacific region. We assume regional peculiarities to additionally influence the Asian Pacific results. This assumption, however, requires a more detailed analysis.

our hypothesis the impact of the financial crisis upon the conglomerate discount should be smallest for Continental Europe.

Performing regression analyses controlling for firm fixed effects, we document significant conglomerate discounts during the pre-recession period for Asia Pacific, the British Isles, and North America, while the Continental European coefficient of the diversification dummy is insignificant. During the 2008-2009 financial crisis, the discount significantly decreases for Asia Pacific by 10.9%, the British Isles by 5.8%, and North America by 4.7%. In case of the Asian Pacific region, the crisis even turns the conglomerate discount into a premium. For Continental Europe, however, the interaction between diversification dummy and crisis indicator is close to zero and insignificant. These results are in support of our hypothesis: the financial crisis led to an increase in the value of diversification in regions with relatively better developed capital markets and stronger investor protection, whereas for the region displaying the lowest level of market maturity and investor rights the positive impact of the financial crisis upon the relative valuation of diversified firms was below the limit of detection.

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**Table 1:****Sample selection process**

Data are gathered from the Thomson Reuters Datastream and Thomson Reuters Worldscope databases. The request is restricted to publicly traded firms in four regions: Developed Asia Pacific, British Isles, Continental Europe, and North America. We consider the period from 1998 to 2009.

Total number of requested firm-years from Worldscope	334,144	100.0%
Exclusion of firm-years where no SIC code is available for the first segment	(183,694)	-55.0%
Exclusion of firm-years with segments in the financial sector (SIC code 6000 - 6999)	(16,481)	-4.9%
Exclusion of firm-years with nonclassifiable segments (SIC code 9999)	(18,792)	-5.6%
Exclusion of firm-years with insufficient financial information	(24,278)	-7.3%
Exclusion of firm-years with faulty sales figures	(10,933)	-3.3%
Exclusion of firm-years where total sales are less than 20 million US\$	(10,318)	-3.1%
Exclusion of firm-years from countries other than the selected ones	(238)	-0.1%
Exclusion of firm-years with negative firm or enterprise value	(858)	-0.2%
Double entries	(222)	-0.1%
Final sample	68,330	20.4%

**Table 2:****Distribution of firm-year observations among regions**

The table lists the included countries per region and shows how conglomerate and standalone observations are absolutely and relatively distributed among them. Firms are defined as conglomerate if they report sales in two or more Fama-French segments, with the most important segment accounting for less than 90% of total sales. Correspondingly, firms are defined as standalone if they report sales in only one Fama-French segment or if the most important segment accounts for more than 90% of total sales.

	Standalones		Conglomerates		Total
	absolute	relative	absolute	relative	absolute
Final sample	56,939	83.3%	11,391	16.7%	68,330
Asia Pacific	16,873	81.8%	3,748	18.2%	20,621
Australia	1,366	78.8%	367	21.2%	1,733
Japan	12,936	84.4%	2,398	15.6%	15,334
Singapore	1,399	67.8%	665	32.2%	2,064
South Korea	1,172	78.7%	318	21.3%	1,490
British Isles	6,462	79.2%	1,692	20.8%	8,154
Ireland	225	68.4%	104	31.6%	329
United Kingdom	6,237	79.7%	1,588	20.3%	7,825
Continental Europe	11,499	77.8%	3,281	22.2%	14,780
Austria	285	85.3%	49	14.7%	334
Belgium	391	70.2%	166	29.8%	557
Finland	498	74.6%	170	25.4%	668
France	2,722	71.3%	1,093	28.7%	3,815
Germany	2,555	79.0%	680	21.0%	3,235
Italy	801	80.3%	197	19.7%	998
Luxembourg	91	82.7%	19	17.3%	110
Netherlands	786	80.5%	191	19.5%	977
Norway	688	86.4%	108	13.6%	796
Portugal	223	89.9%	25	10.1%	248
Spain	485	82.3%	104	17.7%	589
Sweden	1,160	84.2%	217	15.8%	1,377
Switzerland	814	75.7%	262	24.3%	1,076
North America	22,105	89.2%	2,670	10.8%	24,775
Canada	3,063	93.6%	211	6.4%	3,274
United States	19,042	88.6%	2,459	11.4%	21,501

**Table 3:****Summary statistics on conglomerates and standalones per region**

The table exhibits descriptive statistics per region. Market to book (MTB) serves as proxy for growth opportunities and is defined as total assets plus market value of equity minus book value of equity, divided by total assets. Size is defined as the natural logarithm of a firm's total assets. Profitability is the ratio of a firm's earnings before interest and taxes to sales. The leverage ratio is defined as book value of debt divided by total assets. Significance is indicated at 1% (\*\*\*) , 5% (\*\*), and 10% (\*) levels. The significance of median values is based on the Wilcoxon signed-rank test.

	No. Seg.		MTB		Size		Profitability		Cash/sales		Capex/sales		Leverage	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
<b>Asia Pacific</b>														
All	1.260	1.011	1.011	12.469	0.044	0.121	0.026	0.188						
Conglomerates (1)	2.433	1.000	1.000	12.200	0.046	0.125	0.029	0.195						
Standalones (2)	1.000	1.014	1.014	12.530	0.043	0.120	0.026	0.186						
Difference (1)-(2)		(0.014)**	(0.329)**		0.003	0.005	0.003***	0.010						
<b>British Isles</b>														
All	1.277	1.354	1.354	11.890	0.067	0.058	0.032	0.184						
Conglomerates (1)	2.337	1.313	1.313	12.321	0.061	0.056	0.034	0.212						
Standalones (2)	1.000	1.364	1.364	11.769	0.069	0.059	0.031	0.174						
Difference (1)-(2)		(0.051)**	0.552***		(0.008)**	(0.003)**	0.003***	0.038***						
<b>Continental Europe</b>														
All	1.313	1.281	1.281	12.099	0.061	0.082	0.036	0.212						
Conglomerates (1)	2.410	1.262	1.262	12.235	0.060	0.068	0.038	0.230						
Standalones (2)	1.000	1.287	1.287	12.071	0.061	0.086	0.036	0.208						
Difference (1)-(2)		(0.025)	0.164***		0.033*	(0.018)**	0.002***	0.022***						
<b>North America</b>														
All	1.139	1.495	1.495	12.814	0.074	0.081	0.038	0.191						
Conglomerates (1)	2.293	1.438	1.438	13.229	0.080	0.056	0.036	0.229						
Standalones (2)	1.000	1.504	1.504	12.774	0.073	0.085	0.038	0.184						
Difference (1)-(2)		(0.066)**	0.479***		0.008	(0.029)**	(0.002)**	0.047***						

**Table 4:****The level of capital market development**

The table displays capital market development indicators per region for the period from 1998 to 2007. Data are gathered from World Bank's WDI database. Regional indicators correspond to the sum of population-weighted country indicators.

<b>Panel A: GNI per capita (in US\$)</b>												
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Mean	
Asia Pacific	26,135	25,672	27,219	27,597	26,576	27,018	30,085	32,542	33,261	33,625	28,973	
British Isles	22,304	23,365	24,431	24,423	26,232	29,259	34,762	39,078	41,384	44,637	30,988	
Continental Europe	24,040	23,580	23,356	22,311	21,750	24,469	29,660	33,908	36,071	38,183	27,733	
North America	29,899	31,480	33,635	34,205	34,679	36,991	40,682	43,522	45,349	46,252	37,669	

<b>Panel B: Market capitalization of listed companies (% of GDP)</b>												
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Mean	
Asia Pacific	60.02%	103.54%	63.17%	58.08%	56.93%	75.81%	83.21%	103.88%	109.27%	110.67%	82.46%	
British Isles	157.84%	187.74%	168.96%	142.54%	111.51%	127.29%	123.66%	129.06%	149.81%	131.72%	143.01%	
Continental Europe	68.20%	86.21%	92.29%	72.59%	55.03%	63.38%	66.54%	68.55%	87.58%	91.11%	75.15%	
North America	147.39%	173.16%	148.99%	131.70%	102.19%	126.15%	136.27%	134.48%	144.42%	143.62%	138.84%	

<b>Panel C: Total value of stocks traded (% of GDP)</b>												
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Mean	
Asia Pacific	30.81%	78.50%	92.15%	69.64%	67.29%	69.63%	78.75%	115.17%	139.08%	160.38%	90.14%	
British Isles	78.26%	89.33%	117.60%	120.10%	112.78%	113.14%	159.19%	172.97%	164.48%	346.07%	147.39%	
Continental Europe	55.63%	61.52%	90.57%	86.65%	73.19%	61.16%	69.20%	81.78%	106.78%	137.55%	82.40%	
North America	140.85%	185.26%	298.84%	262.21%	221.45%	131.72%	154.21%	161.48%	234.83%	285.87%	207.67%	

**Table 4 cont'd:**  
**The level of capital market development**

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Mean
Asia Pacific	25.48	26.61	28.50	28.27	32.00	33.24	34.65	36.03	36.13	39.61	32.05
British Isles	34.84	32.50	31.58	31.62	39.00	37.22	39.71	43.68	45.79	40.52	37.65
Continental Europe	11.90	14.23	15.11	15.26	19.60	21.09	20.82	20.59	20.09	20.09	17.88
North America	32.13	29.42	28.57	24.22	29.60	27.57	27.18	27.04	26.96	26.97	27.97

**Table 5:**  
**The legal context**

The table lists countries' legal systems and anti-director rights indices (ADRI) as classified by La Porta et al. (1997, 1998) and Djankov et al. (2008); in addition, mean averaged ADRI per region are provided.

	Legal origin	Anti-director rights index		
		LLSV (1997)	LLSV (1998)	DLLS(2008)
Asia Pacific (mean)		3.00	3.50	4.50
Australia	English	4.00	4.00	4.00
Japan	German	3.00	4.00	4.50
Singapore	English	3.00	4.00	5.00
South Korea	German	2.00	2.00	4.50
British Isles (mean)		3.50	4.50	5.00
Ireland	English	3.00	4.00	5.00
United Kingdom	English	4.00	5.00	5.00
Continental Europe (mean)		1.58	2.33	3.17
Austria	German	2.00	2.00	2.50
Belgium	French	0.00	0.00	3.00
Finland	Scandinavian	2.00	3.00	3.50
France	French	2.00	3.00	3.50
Germany	German	1.00	1.00	3.50
Italy	French	0.00	1.00	2.00
Luxembourg	French	N/A	N/A	N/A
Netherlands	French	2.00	2.00	2.50
Norway	Scandinavian	3.00	4.00	3.50
Portugal	French	2.00	3.00	2.50
Spain	French	2.00	4.00	5.00
Sweden	Scandinavian	2.00	3.00	3.50
Switzerland	German	1.00	2.00	3.00
North America (mean)		4.50	5.00	3.50
Canada	English	4.00	5.00	4.00
United States	English	5.00	5.00	3.00

**Table 6:****Excess values of conglomerates and standalones: Development over time**

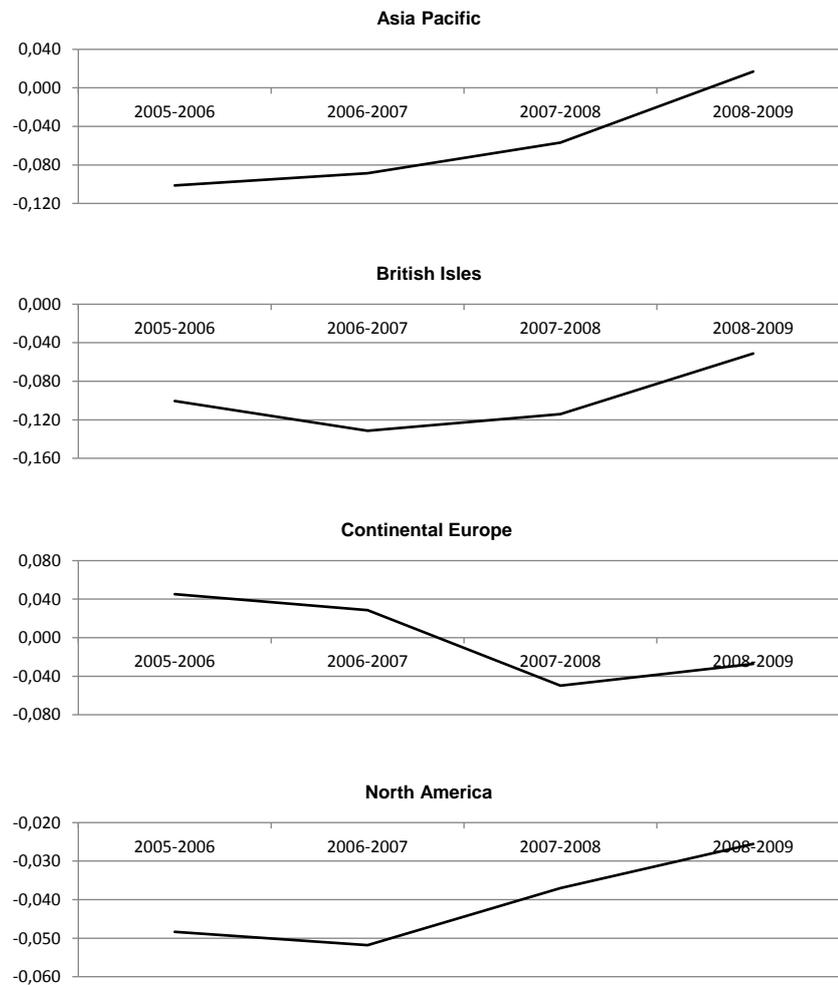
This table exhibits the development of mean excess values of conglomerates and standalones per region over time. Excess value is defined as the natural logarithm of the actual enterprise value divided by an imputed enterprise value. The imputed value is the sum of all imputed segment values. A segment's imputed value is the sales value of the segment multiplied with the geometric mean aggregated enterprise value to sales ratio of all standalone firms operating in the same Fama-French industry in a certain year. Firms with imputed values greater than four or less than one-fourth times the actual value are excluded from the sample. Significance is indicated at 1% (\*\*\*) , 5% (\*\*), and 10% (\*) levels.

	98-99	99-00	00-01	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09
<b>Asia Pacific</b>											
Conglomerates (1)	(0.018)	(0.042)	(0.042)	(0.042)	(0.052)	(0.109)	(0.142)	(0.116)	(0.089)	(0.037)	0.049
No. of obs.	421	476	560	595	560	543	565	561	557	576	566
Standalones (2)	0.012	0.008	0.020	0.027	0.033	0.013	(0.013)	(0.015)	(0.000)	0.020	0.032
No. of obs.	1,264	1,623	2,019	2,242	2,356	2,532	2,773	2,998	3,162	3,236	3,253
Difference (1)-(2)	(0.029)	(0.051)	(0.062)**	(0.069)**	(0.085)***	(0.122)***	(0.129)***	(0.101)***	(0.089)***	(0.057)**	0.017
<b>British Isles</b>											
Conglomerates (1)	(0.048)	(0.066)	(0.019)	(0.032)	(0.010)	(0.027)	(0.086)	(0.061)	(0.094)	(0.056)	0.023
No. of obs.	345	275	248	239	225	212	226	245	240	217	167
Standalones (2)	0.010	(0.004)	(0.006)	0.034	0.071	0.055	0.039	0.039	0.037	0.058	0.074
No. of obs.	1,057	979	932	920	883	868	926	1,010	1,031	943	826
Difference (1)-(2)	(0.057)	(0.062)	(0.014)	(0.066)	(0.081)*	(0.081)*	(0.125)***	(0.101)**	(0.131)***	(0.114)**	(0.051)
<b>Continental Europe</b>											
Conglomerates (1)	0.076	0.018	0.057	0.143	0.097	0.004	0.030	0.144	0.107	0.081	0.093
No. of obs.	505	576	709	731	639	547	469	422	379	308	255
Standalones (2)	0.003	0.004	0.018	0.142	0.154	0.095	0.110	0.099	0.078	0.131	0.121
No. of obs.	1,270	1,349	1,446	1,503	1,561	1,637	1,728	1,905	2,099	2,117	2,068
Difference (1)-(2)	0.074*	0.014	0.040	0.001	(0.057)	(0.091)	(0.080)	0.045	0.029	(0.050)	(0.027)
<b>North America</b>											
Conglomerates (1)	(0.136)	(0.154)	(0.082)	(0.023)	(0.016)	(0.015)	(0.011)	(0.014)	(0.028)	(0.001)	0.030
No. of obs.	511	528	540	495	395	344	320	315	325	317	290
Standalones (2)	(0.022)	(0.007)	0.023	0.055	0.060	0.037	0.026	0.034	0.024	0.036	0.055
No. of obs.	2,238	2,268	2,407	2,590	2,764	3,027	3,331	3,647	3,975	4,147	4,281
Difference (1)-(2)	(0.114)***	(0.147)***	(0.105)***	(0.078)**	(0.076)**	(0.052)	(0.037)	(0.048)	(0.052)	(0.037)	(0.026)

**Figure 1:**

**Excess values of conglomerates and standalones: Development over time**

Figure 1 illustrates the development of the difference between mean conglomerate excess values and mean standalone excess values from 2005 to 2009.



**Table 7:****Excess values of conglomerates and standalones: Non-crisis years versus crisis years**

The table exhibits mean excess values of conglomerates and standalones per region, differentiating between non-crisis years (1998-2007) and crisis years (2008-2009). Excess value is defined as the natural logarithm of the actual enterprise value divided by an imputed enterprise value. The imputed value is the sum of all imputed segment values. A segment's imputed value is the sales value of the segment multiplied with the geometric mean aggregated enterprise value to sales ratio of all standalones firms operating in the same Fama-French industry in a certain year. Firms with imputed values greater than four or less than one-fourth times the actual value are excluded from the sample. Significance is indicated at 1% (\*\*\*), 5% (\*\*), and 10% (\*) levels.

	Asia Pacific				British Isles			
	Non-crisis (I)	Crisis (II)	Diff. (II)-(I)	Diff. (II)-(I)	Non-crisis (I)	Crisis (II)	Diff. (II)-(I)	Diff. (II)-(I)
Conglomerates (1)	(0.071)	0.049			(0.051)	0.023		
No. of obs.	2,663	566			1,284	167		
Standalones (2)	0.008	0.032			0.030	0.074		
No. of obs.	11,574	3,253			4,829	826		
Diff. (1) - (2)	(0.080)***	0.017	0.097	0.097	(0.081)***	(0.051)		0.030
	Continental Europe				North America			
	Non-crisis (I)	Crisis (II)	Diff. (II)-(I)	Diff. (II)-(I)	Non-crisis (I)	Crisis (II)	Diff. (II)-(I)	Diff. (II)-(I)
Conglomerates (1)	(0.040)	(0.019)			(0.064)	0.030		
No. of obs.	2,701	255			2,091	290		
Standalones (2)	(0.009)	0.009			0.024	0.055		
No. of obs.	8,104	2,068			14,715	4,281		
Diff. (1) - (2)	(0.031)**	(0.028)	0.003	0.003	(0.088)***	(0.026)		0.062

**Table 8:****The impact of the financial crisis on the value of diversification: OLS regressions**

The table shows the regression estimates of excess value on the interaction between diversification and the financial crisis. Excess value is defined as the natural logarithm of the actual enterprise value divided by an imputed enterprise value. The imputed value is the sum of all imputed segment values. A segment's imputed value is the sales value of the segment multiplied with the geometric mean aggregated enterprise value to sales ratio of all standalone firms operating in the same Fama-French industry in a certain year. Firms with imputed values greater than four or less than one-fourth times the actual value are excluded from the sample. Diversification dummy is an indicator variable set equal to 1 if the firm operates in two or more Fama-French segments, with the most important segment accounting for less than 90% of total sales. Crisis indicator is an indicator variable set equal to 1 for the crisis years 2008 and 2009; it is set equal to zero for the years 1998 to 2007. Control variables include size (natural log of total assets), profitability (EBIT to sales), cash to sales, capex to sales and leverage (debt to total assets). The p-value of the t-test of equality of the coefficient to zero is reported in parentheses. Significance is indicated at 1% (\*\*\*), 5% (\*\*), and 10% (\*) levels.

Variables	Asia Pacific	British Isles	Cont. Europe	North America
Constant	(0.526)*** (3.828)	(0.962)*** (3.409)	(0.448)** (2.391)	(0.737)*** (2.578)
Div. Dummy	(0.067)*** (4.618)	(0.104)*** (4.184)	(0.010) (0.556)	(0.053)** (2.242)
Crisis indicator	0.030*** 2.917	(0.016) (1.212)	(0.094)*** (2.747)	(0.008) (0.370)
Div. Dummy * Crisis	0.109** 2.453	0.058** 2.210	0.008 0.540	0.047*** 3.027
Size	0.025** 2.177	0.070*** 3.082	0.025 1.551	0.052** 2.314
Profitability	0.339*** 7.460	0.302*** 9.769	0.200*** 4.185	0.133*** 4.182
Cash to sales	(0.001) (0.012)	0.145*** 3.808	0.134*** 6.399	0.157*** 7.020
Capex to sales	0.764*** 10.564	0.550*** 11.020	0.025 0.739	0.262*** 6.374
Leverage	0.714*** 13.517	0.294*** 5.012	0.450*** 5.275	0.090*** 3.387
Adjusted R	0.645	0.616	0.676	0.638
F-Statistics	9.903	8.046	10.212	12.227
Observations	17,148	7,095	12,805	20,606

**Table 9:****The impact of the financial crisis on the value of diversification: Robustness tests**

The table exhibits various robustness tests. We change the base model in table 7, making the following modifications: In Panel A, excess values based on firm values and median aggregated industry multipliers are used. In Panel B, we apply 2-digit SIC codes for industry classification. In Panel C, we use excess values based on firm values and median aggregated industry multipliers and apply 2-digit SIC codes for industry classification.

<b>Panel A:</b> Fama-French classification with excess values based on FV / median				
Variables	Asia Pacific	British Isles	Cont. Europe	North America
Constant	(0.586)*** (5.533)	(0.861)*** (3.055)	(0.543)*** (3.211)	(0.573)* (1.926)
Div. Dummy	(0.068)*** (4.394)	(0.124)*** (5.238)	(0.026)* (1.837)	(0.056)*** (2.930)
Crisis indicator	(0.013) (0.875)	(0.060)*** (3.643)	(0.103)*** (4.561)	(0.031)* (1.685)
Div. Dummy * Crisis	0.087*** 4.337	0.068** 2.290	0.003 0.203	0.037*** 2.625
Size	0.025*** 2.874	0.059*** 2.596	0.031** 2.157	0.033 1.445
Profitability	0.224*** 5.044	0.258*** 11.067	0.214*** 4.531	0.149*** 5.460
Cash to sales	0.562*** 13.347	0.393*** 7.594	0.468*** 6.863	0.422*** 20.908
Capex to sales	0.547*** 8.295	0.487*** 10.005	0.011 0.414	0.281*** 6.023
Leverage	0.586*** 14.512	0.192*** 4.839	0.348*** 4.713	0.058** 2.253
Adjusted R	0.706	0.638	0.709	0.676
F-Statistics	13.135	8.781	11.907	14.445
Observations	18,001	7,217	13,112	20,912

*continues*

**Table 9 cont'd:****The impact of the financial crisis on the value of diversification: Robustness tests****Panel B:** 2-digit SIC code classification with excess values based on EV / geo. mean

Variables	Asia Pacific	British Isles	Cont. Europe	North America
Constant	(0.904)*** (4.814)	(1.145)*** (4.112)	(0.577)*** (3.348)	(0.897)*** (3.307)
Div. Dummy	(0.041)** (2.364)	(0.093)*** (3.346)	(0.016) (0.738)	(0.053)** (2.224)
Crisis Indicator	0.036*** 4.658	(0.033)*** (2.921)	(0.089)*** (2.680)	(0.008) (0.359)
Div. Dummy * Crisis	0.072* 1.832	0.028 1.034	0.012 0.502	0.064*** 3.673
Size	0.058*** 3.744	0.086*** 3.838	0.033** 2.207	0.063*** 2.953
Profitability	0.248*** 5.462	0.297*** 15.684	0.190*** 5.000	0.136*** 4.296
Cash to sales	(0.026) (0.553)	0.116*** 2.704	0.129*** 6.072	0.166*** 9.101
Capex to sales	0.157*** 2.640	0.517*** 10.353	0.029 0.727	0.246*** 7.240
Leverage	0.729*** 14.435	0.270*** 6.930	0.509*** 5.517	0.084*** 3.866
Adjusted R	0.637	0.601	0.666	0.636
F-Statistics	9.531	7.603	9.807	12.166
Observations	16,895	7,053	12,762	20,656

*continues*

**Table 9 cont'd:****The impact of the financial crisis on the value of diversification: Robustness tests****Panel C:** 2-digit SIC code classification with excess values based on FV / median

Variables	Asia Pacific	British Isles	Cont. Europe	North America
Constant	(0.919)*** (9.639)	(0.943)*** (3.254)	(0.724)*** (4.375)	(0.664)** (2.268)
Div. Dummy	(0.051)*** (3.464)	(0.102)*** (5.055)	(0.020) (1.100)	(0.053)** (2.471)
Crisis indicator	0.002 0.174	(0.063)*** (4.683)	(0.096)*** (4.167)	(0.045)*** (2.860)
Div. Dummy * Crisis	0.067*** 3.235	0.021 0.606	0.002 0.113	0.058*** 3.328
Size	0.053*** 7.073	0.068*** 2.883	0.044*** 3.138	0.040* 1.756
Profitability	0.177*** 3.980	0.245*** 10.685	0.177*** 3.768	0.145*** 5.271
Cash to sales	0.612*** 21.941	0.398*** 6.820	0.451*** 6.656	0.459*** 22.669
Capex to sales	0.105*** 2.649	0.475*** 8.300	0.015 0.482	0.241*** 6.546
Leverage	0.568*** 11.849	0.134*** 3.408	0.408*** 5.220	0.056** 2.456
Adjusted R	0.706	0.611	0.700	0.674
F-Statistics	12.970	7.947	11.437	14.347
Observations	17,714	7,166	13,057	20,864

# A Appendix

**Table A.1:**

**Excess values of conglomerates and standalones (without outlier cut-off): Development over time**

This table exhibits the development of mean excess values of conglomerates and standalones per region over time. Excess value is defined as the natural logarithm of the actual enterprise value divided by an imputed enterprise value. The imputed value is the sum of all imputed segment values. A segment's imputed value is the sales value of the segment multiplied with the geometric mean aggregated enterprise value to sales ratio of all stand-alone firms operating in the same Fama-French industry in a certain year. Firms with imputed values greater than four or less than one-fourth times the actual value are kept in the sample. Significance is indicated at 1% (\*\*\*) , 5% (\*\*), and 10% (\*) levels.

	98-99	99-00	00-01	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09
<b>Asia Pacific</b>											
Conglomerates (1)	(0.008)	(0.042)	(0.049)	(0.104)	(0.176)	(0.207)	(0.238)	(0.237)	(0.187)	(0.093)	(0.060)
No. of obs.	458	540	646	685	655	637	652	647	633	641	651
Standalones (2)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
No. of obs.	1,369	1,862	2,344	2,545	2,698	2,901	3,141	3,377	3,540	3,661	3,776
Difference (1)-(2)	(0.008)	(0.042)	(0.049)	(0.104)***	(0.176)***	(0.207)***	(0.238)***	(0.237)***	(0.187)***	(0.093)**	(0.060)
<b>British Isles</b>											
Conglomerates (1)	(0.059)	(0.061)	(0.022)	(0.077)	(0.079)	(0.086)	(0.128)	(0.097)	(0.148)	(0.158)	(0.120)
No. of obs.	378	311	280	263	248	233	245	265	261	242	191
Standalones (2)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
No. of obs.	1,191	1,139	1,088	1,048	998	981	1,041	1,126	1,155	1,104	989
Difference (1)-(2)	(0.059)	(0.061)	(0.022)	(0.077)	(0.079)	(0.086)	(0.128)**	(0.097)*	(0.148)**	(0.158)**	(0.120)
<b>Continental Europe</b>											
Conglomerates (1)	(0.142)	(0.068)	(0.064)	(0.026)	(0.001)	(0.031)	(0.022)	(0.057)	(0.057)	(0.008)	0.002
No. of obs.	567	665	804	806	687	581	500	442	394	325	274
Standalones (2)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
No. of obs.	1,424	1,561	1,672	1,706	1,746	1,817	1,917	2,118	2,355	2,415	2,381
Difference (1)-(2)	(0.142)***	(0.068)	(0.064)	(0.026)	(0.001)	(0.031)	(0.022)	(0.057)	(0.057)	(0.008)	0.002
<b>North America</b>											
Conglomerates (1)	(0.194)	(0.174)	(0.076)	(0.079)	(0.097)	(0.084)	(0.051)	(0.022)	(0.050)	(0.058)	(0.062)
No. of obs.	584	618	626	561	436	375	347	338	348	346	321
Standalones (2)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
No. of obs.	2,685	2,820	2,925	3,037	3,167	3,410	3,753	4,095	4,502	4,862	5,073
Difference (1)-(2)	(0.194)***	(0.174)***	(0.076)	(0.079)*	(0.097)**	(0.084)*	(0.051)	(0.022)	(0.050)	(0.058)	(0.062)