Corporate Diversification: The Role of Industry-specific Expertise and The Impact of Mergers and Acquisitions Accounting

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Dissertation submitted for the degree of

Doctor of Philosophy in Management at

The London School of Economics and Political Science

April 2010

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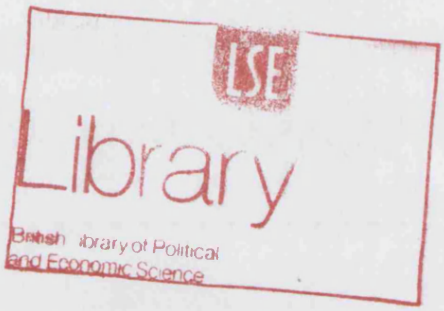

Declaration

I declare that the work presented in this thesis is my own.

The chapter 2 in this thesis is joint work with Daniel Metzger.

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Abstract

This thesis is organised in three chapters. The first two chapters link the industry-specific expertise of managers to the value of conglomerates and diversifying acquisitions. The third chapter explains how Mergers and Acquisitions (M&A) accounting can explain the diversification discount.

The first chapter studies the cross sectional variation of conglomerate's value. I test the hypothesis that unrelated diversification destroys value because managers (CEOs) lack expertise outside the core business. I test two main implications: firms with more business activities outside the core business should have lower value and the discount should be greater for firms with more activity in unrelated-to-core secondary segments. The evidence supports both hypothesis. I test more directly if the results are linked to a lack of managerial expertise by using an industry index of managerial discretion. I find that increasing non-core business sales weight by 10% decreases firm value up to 3%, if the firm has high managerial discretion.

The second chapter quantifies the value of CEO industry-specific experience, using diversifying M&A announcements. I find that industry experienced CEOs add value for their shareholders. The abnormal return is between 1.0% and 1.3% higher when the acquirer's CEO has top management experience in the target's industry. Analyzing potential mechanisms, I provide evidence that CEOs with industry experience in the target's industry negotiate better terms and that this experience is particularly valuable in environments of high informational asymmetries (1.6% - 2.9%). The results suggest that certain CEO skills are neither completely general nor firm-specific but rather specific to an industry.

The third chapter shows that M&A accounting can explain the diversification discount measured with Tobin's q. The typical M&A accounting procedure inflates the book value of assets and creates a mechanical drop in the common measure of acquirers' q. Because diversified firms are more acquisitive than standalones, their q is likely to be lower, generating a spurious diversification discount. After adjusting q for goodwill by excluding it from the book value of assets, I find no significant diversification discount in most specifications. As an alternative to the goodwill correction, I use the change in the M&A accounting rules in 2001 as a natural experiment to test my main hypothesis.

Acknowledgements

First and foremost I would like to thank Antoine Faure-Grimaud, Daniel Ferreira and Denis Gromb for invaluable support, advice and guidance.

I also would like to thank my friends and collegues Sridhar Arcot, Jan Bena, Dragana Cvijanovic, Gabriela Domingues, Vincent Fardeau, Sónia Gonçalves, Fabian Garavito, Cristian Huse, Carlos Santos for their friendship, support and valuable comments. I am also indebted to Daniel Metzger, my co-author on the work included in chapter 2. Without them LSE would not be the same.

A special thanks to David DeMeza, David Webb and Michela Verardo for their support on several occasions during my years at the LSE.

I also want to express my gratitude to Miguel Ferreira and Clara Raposo for their support over these years.

I acknowledge the support from FCT - Fundação para a Ciência e Tecnologia and ISCTE - Instituto Superior das Ciências do Trabalho e da Empresa.

Finally, I would like to thank my mother Ana and my father Joaquim for their unconditional love and understanding and also to my grandparents Consolação, José, Odete and Ramiro. They were the ones first giving me the opportunity to accomplish my graduate studies.

This manuscript is dedicated to my husband José.

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1.1 Introduction

The literature on the diversification discount is vast and several explanations are offered to the fact that conglomerates are worth less than an equivalent portfolio of stand alone firms.[1]. In this chapter I explore the cross-sectional variation of conglomerates' value to test the intuitive hypothesis that conglomerates with more unrelated businesses are less valuable due to a lack of managerial expertise outside the core-business of the firm. Managers are likely to be experts in the core-business industry, but are also likely to lack knowledge and expertise in industries that do not correspond to the main operations of the firm. As a result, diversified firms are expected to underperform when compared to stand alone firms, at least in their secondary segments. In order to test this hypothesis, I develop a set of alternative diversification measures to capture both the extent of diversification outside the core-business and the distance of secondary segments to the core-business of the firm. Then, in a more direct analysis, I use an industry index of managerial discretion, which captures how determinant are managerial actions to firm performance, to test if high managerial discretion firms suffer more from increasing non-core activities. Using a panel of US firms from 1984 to 1998, I find empirical evidence consistent with my hypothesis.

I proceed in three steps. I start by testing two implications of the argument that lack of managerial expertise outside the core-business destroys value. First, firms with more business activity in secondary businesses should have lower value, because the lack of expertise from the manager affects a larger proportion of its operations; and second, this value loss should be greater for companies where secondary segments are more unrelated-to-the-core-business, because the lack of managerial expertise is likely to be greater in unrelated industries. To test the first implication I create a sales-shift measure of diversification that captures the importance of non-core business segments in the firm. The sales-shift measure is defined as the proportion of sales in non-core business segments, where the core business corresponds to the business-segment with the highest sales. The second implication is tested using a distance-to-core-business measure to capture the unrelatedness between the core industry and the industries of the secondary segments. The distance-to-core-business is defined using the SIC-code structure at the 4-digit level by comparing the code of the core-business with the code of non-core segments. Secondary business are therefore classified as being one, two, three or four digits away from the core-business depending on the number or left digits of the code they share with the core-business. I then compute the sales-shift measure

[1] Lang and Stulz (1994), Berger and Ofek (1995), Rajan Servaes and Zingales (2000) and Lamont and Polk (2002) find evidence of a diversification discount. Laeven and Levine (2008) find a conglomerate discount in financial conglomerates.

for the different distances to core. In this first step, I find evidence that increasing the proportion of sales outside the core by 10% decreases firm value by approximately 1%. I also find that the negative impact of sales-shifting is higher for business segments that are 2 or more digits away from the core. For instance, increasing the sales weight by 10% in segments 3-digits away from the core negatively impacts firm value in 1.4%.

Because the previous analysis does not directly tests the hypothesis that diversification destroys value due to a lack of managerial expertise I further investigate the previous results for firms with different levels of managerial discretion. In this second step, I use an industry index of managerial discretion developed by Hambrick and Abrahamson's (1995) that classifies industries according to its reliance on the managers' actions. If managerial expertise is core-specific, high discretion conglomerates, whose performance highly depends on managerial skills, are more likely to suffer from diversification outside the core and even more if the secondary segments are unrelated. I find supporting results; increasing the sales-weight of secondary business segments by 10% in a high discretion conglomerate has a negative impact in value of approximately 2%, while no impact is found in low discretion conglomerates. The strongest negative impact of sales-shift is found for high discretion conglomerates with secondary segments 3-digits away from the core-business: a 10% increase in sales-shift in those segments decreases firm value by approximately 3%.

Finally, to support my previous results and the validity of the managerial discretion index I test two additional hypothesis using data on managerial compensation. If the market for managers works efficiently then two effects can be expected. First, if managers in diversified firms lack expertise in secondary businesses and underperform stand alone managers in the same industries, no premium in compensation should be observed for managing a diversified firm. In a similar way, if managers in low discretion industries are less crucial for firm performance then their compensation should be lower as well. I find consistent evidence; I find that firms with higher level of managerial discretion pay more to their CEO, after controlling for other variables that impact compensation. This positive correlation between compensation and the managerial discretion level of firms validates the index of managerial discretion, suggesting that it is properly measuring the importance of managerial actions to the firm. I also find no evidence that managers in diversified firms are paid more.

The argument that firms should diversify to related industries because managers have limited expertise to run businesses that are different from the core was first used by Jensen (1986). However, little work has been done using the managerial dimension to explain causes and effects of corporate diversification with the exception of Schoar (2002) and Malmendier and Tate (2008). Schoar (2002) provides a rationale for the diversification discount based on managers' behaviour that she calls the "new toy effect". She finds an overall negative effect of diversification using plant level data, caused by a simultaneous decrease in productivity of the incumbent plant and an increase in productivity of the acquired plant that she argues to be caused by a defocus

in managerial attention towards the new plant. Malmendier and Tate (2008) show that overconfident managers destroy value by overestimating the returns of mergers.

In a more broad sense, this paper relates to the literature that uses the managerial dimension to explain differences in firm policies and value. Bertrand and Schoar (2003) attribute unexplained variations in firm practices and performance to individual managers, saying that managers fixed effects are relevant to explain acquisitions and diversification decisions. Adams, Almeida and Ferreira (2005) use CEO's power to explain the degree of variability in firm performance. Malmendier and Tate (2005a, 2005b, 2008) attribute inefficient corporate investment and mergers decisions to managerial overconfidence. This paper contributes to this literature by providing new evidence that the managerial dimension matters while explaining differences in firm actions and value. It also adds to the literature on corporate diversification by identifying the lack of managerial expertise outside the core business as a source of value destruction and by identifying managerial discretion as an industry characteristic that is relevant for the linkage between diversification and performance. In this sense, the paper relates to Santalo and Becerra (2008) who find that diversified firms perform better in industries with a smaller number of specialized players.

This chapter proceeds as follows: section 2 formalizes the empirical hypothesis and describes the diversification measures and managerial discretion index. Data is presented in section 3 and empirical tests in section 4. Session 5 deals with robustness issues and finally section 6 concludes.

1.2 Empirical hypothesis, diversification measures and managerial discretion index

The main hypothesis to be tested in this paper is the following: diversification activities outside the core are expected to destroy value because managers have industry-specific expertise, being experts in the core-business industry of the firm and lacking knowledge and experience in other industries[2].

If managers do have industry-specific human capital to the core-business of the firm this implies that, with respect to the core business, they should perform as well as the average manager of a stand alone firm in the same industry. Once diversifying towards a different industry though, they are expected to perform worse than the average manager of a stand alone company in that industry. Therefore, and neutralizing other possible effects of corporate diversification, the value of a diversified company should be lower than a portfolio of stand-alone companies in the same industries. This is because the diversified firm will be destroying value, at least, in the periphery. Furthermore, although managers are assumed to have the necessary skills to do well

[2]Lazear (2003) and (2005) and Harris and Helfat (1997) find significant evidence for the existence of both industry-specific and generic skills of managers.

in the core-business, the lack of expertise in the periphery may have side effects on its performance as well. This can be the case, for instance, if managers need to allocate proportionally more time to secondary segments to reduce the comparative disadvantage and thus neglecting the core business. Diversification outside the core business is measured in this paper by the contribution of secondary segments sales to the total sales of the firm. The business segment's sales proxy for the manager's attention, or time spent while running that segment. The hypothesis that managers underperform outside the core-business reducing the value of the diversified firm implies that companies with more sales outside the core-business present lower value.

The more unrelated the secondary segments are to the core-business, the greater the underperformance in those segments with respect to specialized firms is likely to be. Different industries require different skills from managers and this dissimilarity should be greater for more unrelated industries. The second implication of my main hypothesis is that diversified firms with more activities in more distant-to-core secondary segments should present lower value. The negative effect of diversification outside the core is expected to be increasing with the distance-to-core business of the secondary segments.

To support the claim that lack of managerial ability drives the link between diversification and performance I analyse an industry characteristic that is likely to impact this linkage: the level of managerial discretion. The importance of managerial skills is heterogeneous across industries. There are industries where managers have crucial influence on organizational outcomes and industries where environmental factors are much more significant. It then follows that firms operating in industries where the role of the manager is very important should suffer more from their lack of expertise. Therefore, diversified firms operating in high discretion industries should evidence worse performance than the ones operating in less managerial dependent environments. Two main effects are in place. First, if secondary segments correspond to industries of high managerial discretion, the underperformance outside the core (and thus of the whole firm) should be higher because the managerial skills are critical to subsist in those industries. At the same time, the core-business is also likely to be affected because the manager might need to allocate a proportionally higher part of his attention to the periphery to cope with the needs of these highly demanded segments. Secondly, if the core-business industry is characterized by high managerial discretion then, deviating attention away from it is likely to negatively impact performance and thus the value of the firm. The prediction is for firms with a higher level of managerial discretion to have a stronger negative impact from diversification outside the core-business, and for this effect to be greater for unrelated-to-core diversification. Managerial discretion is measured here using an industry index created by Hambrick and Abrahamson (1995).

As a last step I further explore the relationship between managerial compensation, diversification and managerial discretion. Under the assumption that the market

for managerial skills works efficiently, if according to the previous hypothesis the manager of a diversified firm underperforms the managers of focused firms at least in the periphery one should not observe a premium in compensation for managing a diversified firm. An alternative hypothesis is tested by Rose and Shepard (1997) who argue that diversified firms are more complex organizations, and more difficult to manage, and therefore CEOs should be paid at a premium. They find consistent evidence using a sample of 473 CEOs in 397 firms from 1985 to 1990.

A similar argument is applied to managerial discretion. If the market for market managerial talent does a good job allocating more talented managers to places where their skills are more valuable then one should observe a positive relation between managerial discretion and compensation. It is expected that managers working in high discretion industries to be paid at a premium, because they can add more value in those industries. Note that the notion of managerial discretion here is related to the ability of managers to influence the performance of firms or, in other words, to the importance of managers for the performance of firms. It does not necessarily correspond to the usual agency theory notion of managerial discretion where it implies higher agency costs and greater extraction of private benefits from managers. The fact that managers within an industry have more latitude of action does not imply here they use it to destroy value.

1.2.1 Sales-shift and distance-to-core business

I define a set of diversification measures to capture the relative importance of the core business in the firm and the distance of the secondary segments to the core: sales-shift and sales-shift- 1,2,3 and 4 digits. The core business is defined as the business segment with the highest sales. The distance to core is defined using the SIC code structure. The SIC code is a 4-digit code that allows the assessment of how related/unrelated the industries are. The more left digits of the code the industries share, the more related they are.

Sales-shift, corresponds to the proportion of sales outside the primary business segment of the firm - the core business.

Sales-shift - N digit(s), is defined as the sales proportion generated by secondary segments N digits away from the core-business. The distance between the segment's industry and core business' industry equals 1, if the segment's SIC code differs from the core business SIC code at the 4^{th} digit and not at the 1^{st}, 2^{nd} or 3^{rd}; a value of 2 if the segment's SIC code differs from the core business SIC code at the 3^{rd} digit and not in the 1^{st} or 2^{nd}, a value of 3 if the segment's SIC code differs from the core business SIC code at the 2^{nd} digit and not at the 1^{st} and finally a value of 4 if the segment's SIC code differs from the core business SIC code at the 1^{st} digit.

I use this set of measures to test the first two implications of my hypothesis. Firms with more sales-shift should present a lower value and this value loss should be greater for more distant to the core secondary segments.

1.2.2 The managerial discretion index

Following Adams, Almeida and Ferreira (2005), I use an industry index of managerial discretion developed by Hambrick and Abrahamson (1995) aimed to measure how much influence executives have on organizational outcomes. This index relies on the theoretical formulation of Hambrick and Finkelstein (1987) who specify seven industry-level factors that determine managerial discretion: product differentiability, market growth, industry structure, demand instability, quasi-legal constraints, powerful outside forces and capital intensity. Hambrick and Abrahamson (1995) index corresponds to a panel rating of managerial discretion by academics for 17 industries. Then, they examine the association between this rating and the determinants of discretion proposed by Hambrick and Finkelstein (1987) and conclude for the validity of the index. For instance, according to the index computers are considered to be an industry of high managerial discretion while natural gas distribution is classified as a low managerial discretion.

The index classifies the 17 industries at the 4-digit SIC code level. However, in order to minimize missing values for firms which SIC codes are not covered by this ratting I average the discretion score at the 2-digit SIC level, in the same way as in Adams, Almeida and Ferreira (2005).

I use this index at the firm level. I define the firm managerial discretion score as the sales-weighted average of its business segments' industries discretion score. For stand alone firms this score corresponds to the industry score.

This score allows me to test if firms with higher levels of managerial discretion have a greater negative impact from diversification outside the core-business.

1.2.3 Firm characteristics

In order to control for other diversification effects rather than the lack of managerial expertise outside the core I use a diversification dummy as additional diversification measure. This variable assumes the value one if the firm reports two or more business segments according to COMPUSTAT segment data file and zero otherwise. The goal of adding the diversification dummy is also to capture the effect in firm value of the decision to become diversified and to disentangle this effect from shifting sales away from the core business.

I use Tobin's q as the main measure of firm value. Tobin's q is defined as the ratio between the market value and the book value of assets, being the market value of

assets defined as the book value of assets less the book value of equity plus the market value of equity. Return on Assets (ROA), Excess value and Excess ROA are used as alternative measures of firm value. ROA is defined as earnings before interest and taxes (EBIT) divided by total assets. Excess value and Excess ROA are similar measures to the ones developed by Berger and Offek (1995). Excess value corresponds to the logarithm of the ratio between the firms' actual Tobin's q and its Imputed Tobin's q. The Imputed Tobin's q is defined as the sales-weighted average of hypothetical qs of the firm segments, where the hypothetical q is the average q of stand alone firms in the same industry in that year. The 4-digit SIC code is used in this match whenever there are five or more stand alone players in the industry. If there are less than 5 stand alone firms in the industry the next SIC code level is used, and so forth. A similar procedure is used for Excess ROA. Excess ROA is the difference between ROA and imputed ROA. Imputed ROA is a sales-weighted average of hypothetical ROAs of the firm segments, where the hypothetical ROA is the average of stand alone firms in the same industry in that year. The hypothetical ROA is constructed using at least five non-diversified firms in the same 4-digit SIC code.

The firm financial variables used as controls for firm performance are standard in the corporate diversification literature and include size, measured by the natural logarithm of assets, capital expenditures standardized by sales, profitability measured by EBIT (earnings before interest and taxes) to sales and leverage defined by debt to assets ratio.

1.2.4 Compensation and CEO characteristics

I use total CEO total compensation, including for the individual year: salary, bonus, total value of restricted stock granted, total value of stock options granted (using Black-Scholes) and long-term incentive payouts, to measure CEO pay. Following Rose and Shepard (1997) I use firm and CEO characteristics that are known to affect compensation as control variables. These include the CEO age at appointment, years of tenure as CEO and a dummy variable equal to one if the CEO was hired from outside the firm.

1.3 Data and summary statistics

My innicial sample consists of a panel of 100,588 firm-years from the Compustat Industrial Annual and Compustat Segments files, including stand alone and diversified firms that are present in both data bases. Firms are classified as diversified if they report sales in more than 2 business segments. The Compustat Segments file provides the data at the business segment level. The Compustat Industrial Annual file provides

data on the market value of firms and other financial variables that will be used as controls. Both active and companies that are delisted during the sample period are included. The sample period is 1984 to 2005, beginning in the first year with available SIC codes per business segment and ending in the last year with available data. Following the literature (e.g. Villalonga (2005)) I exclude firms with segments in the financial sector (SIC codes 6000 to 6999), agriculture (SIC code lower than 1000), government (SIC 9000) and other non-economic activities (SIC 8600 and 8800). Unclassified services are also excluded from the sample (SIC 8900). Finally, I drop firms for which the sum of business segments sales deviate from the firm's total sales by more than 5%, and firms with sales of less than $20 million.

Because there is a change in financial reporting in 1998 that impacts the way companies report their business segment data, namely the number of segments, I restrict my sample to the period before 1998. My final panel consists of 48,171 firm-years observations. This issue is discussed in detail in the next section. I use the full sample period only to test the robustness of my results.

For the compensation analysis, I use a sub-sample of the full panel including 2,892 ceo-years from 1991 to 1998. This subsample results from merging the main sample with compensation data from Execucomp.

1.3.1 Sales-shift across time and changes in segment disclosure

Figure 1.1 shows a downward trend in the average sales-shift across time for the subsample of diversified firms. In the full sample, however, there is a sharp increase in average sales outside the core in 1998. This effect is explained by an increase in the number of firms that starts reporting 2 or more business segments in this year due to the change in financial reporting of business segments. Before 1998 companies were disclosing segment information according the SFAS No. 14. SFAS 14 requires firms to report industry segments that are determined by grouping products and services by industry line. SFAS No. 131 changes the definition of business segment to be determined by organizational structure using a management approach. After 1998 firms can decide to report their segments based on line of business, geographic region or combination of both. This change is analysed by Street, Nichols and Gray (2000), who find that a greater number of segments is reported after 1998. The impact of this change only in the subsample of diversified firms, is a decrease in sales weight outside the core, meaning that already diversified companies redefined their business segments and assigned more operations to the core business segment. However, the decreasing trend of sales-shift was valid both before and after 1998, suggesting that diversified firms are becoming more focused.

Figure 1.2 presents the average sales-shift at the four different distances, per year, in the full sample and sub-sample of diversified firms. The global decreasing trend

observed for total sales-shift is mainly driven by a decrease in sales' proportion of segments that are 2, 3 and 4 digits away from the core business. The same pattern is not observed in closely related segments, even before 1998. The impact of the change in reporting seams to be stronger in these related to the core segments. There is a sharp increase of sales proportion in 1998 for one-digit away from the core segments, especially in full sample, suggesting that the new segments reported after SFAS No. 131 is introduced are mainly closely related segments to the core business.

1.3.2 Descriptive statistics and correlations

Table 1.1 shows the descriptive statistics for the full sample of firms and the sub-sample of diversified firms, for the period 1984 to 1998. Diversified firms constitute about 30% of the sample. On average, and when compared to stand alone firms, the diversified firm is bigger, has a higher level debt, similar profitability and capital expenditures with respect to sales.

The summary statistics for the sub-sample of diversified firms allow some characterization of the diversification activity. On average, diversified firms have 3 business segments, thus, 2 secondary segments, which contribute with 33% of total sales. Disaggregating this value, 2% of the sales occur in segments that are just one digit away from the core business, 7% in segments 2-digits away, 11% in segments 3-digits away and finally, the highest proportion, 14% in segments that are 4-digits away from the centre.

The firm average managerial discretion score varies between 2 and 7 points and is slightly higher for stand alone firms. Regarding CEO characteristics and compensation, the CEO of a diversified firm is, on average highly paid, older when appointed and less likely to be externally hired.

The correlations between value, performance measures and independent variables are shown in Table 1.2. As expected, there is a negative correlation between diversification variables and performance. Also to note, there is a positive correlation of discretion score and firm value and a negative correlation between managerial discretion and the diversification dummy.

1.4 Regression results

1.4.1 The impact of Sales-shift on firm value and performance

To test the impact of sales-shift and distance-to-core on firm market valuation and performance I run fixed effects regression of diversification variables on Tobin's q, Excess value, ROA and excess ROA measures. Tobin´s q is defined as the ratio between the market value of assets and the book value of assets, being the market

value of assets defined as the book value of assets less the book value of equity plus the market value of equity. By using fixed effects regression, I expect to capture unobserved heterogeneity among firms that might impact their decision to become diversified and also to correct, into some extent, the endogeneity problem. The fact that firms might not randomly decide to become diversified or specialized affects the analysis of the link between diversification and performance. Villalonga (2004) and Campa an Kedia (2002) suggest a procedure to correct for this self-selection problem. Santalo and Becerra (2008) discuss this procedure in the context of industry heterogeneity and find that some of the instruments used are questionable. Because my main identification strategy relies on an industry measure of managerial discretion I follow Santalo and Becerra (2008) approach and use firm fixed effects, with the caveat that this procedure only corrects for endogeneity as long as it is caused by unobserved fixed characteristics of firms. I also add year dummies in all my specifications to control for business cycle effects that might affect firms in general.

The coefficients from regressions of sales-shift on firm value and performance are presented in Table 1.3. All models include additional financial variables that are known to impact market valuation and performance of firms as controls. These controls include size measured by the natural logarithm of assets, capital expenditures standardized by sales, profitability measured by EBIT (earnings before interest and taxes) to sales, and leverage defined by debt to assets ratio.

All the models reported in this table show a negative effect of sales-shift on firm's market value, excess value, performance and excess performance. This result is significant also when controlling for the decision to diversify, i.e., when including the diversification dummy in the models. The results are also economically significant. When sales-weight outside the core business increases by 10%, the firm value decreases approximately by 1%. This negative effect of sales-shift suggests that on top of the negative impact of the decision to become diversified (the diversification dummy coefficient is negative, although not significant) the market is also discounting the fact that the company gets away from its primary business[3]. The fact that the diversification dummy is not significance once I consider the effect of sales-shift suggests that this measure does a good job as a diversification measure per se.

The result for Tobin's q and excess value show evidence of a discount in market valuation for companies that shift its operations away from the core business. If this discount is driven, as I argue, by a lack of managerial ability outside the core, the negative impact of sales-shift and distance-to-core should be observed not only on the market value of the firm, which is a forward looking measure based on the expectation of futures cash flows, but also on past performance. In fact, this negative effect is also significant in terms of performance and excess performance. Both ROA and excess ROA suffer a negative impact of 0.3% when sales-shift increase by 10%.

These results are consistent with the previously documented diversification dis-

[3]The results are also robust in the subsample of diversified firms

count but also with Schoar (2002)'s "new toy effect". Schoar (2002) shows a negative net impact of diversification in terms of productivity, where the core business suffers from a shift in managerial attention towards the new plant. An implication of this "new toy effect" argument is that firms with more activity outside the core business should experience a greater shift in managerial attention towards the periphery and therefore the impact of sales-shift in firm value should be negative.

1.4.2 The impact of Sales-shift to different distances-to-core on firm value and performance

Table 1.4 shows the results of the same models shown in table 1.3 using now the desegregated sales-shift measure to four different distances-to-core-business. These models test if the negative impact of sales shift is greater for greater distances to the core business. This is expected if managers' lack of expertise is greater for more unrelated-to-the-core industries.

Regressions using Log q and Excess value as dependent variable show a negative impact of sales-shift for segments that are two or more digits away from the core. The effect of sales-shift is increasing with the distance to core up to 3-digits of distance to core business, but is decreasing from 3-digits to 4-digits. The strongest impact of sales-shift is observed for business segments that are 3 digits away from the core: increasing the sales weight of such business segments has an average impact of -1.4% in firm value, and no impact is found for sales-shift at 1-digit level. Performing an F test to check for the equality of these coefficients, I find that I can only reject this hypothesis for the coefficients of sales-shift 1- digit and sales-shift - 3 digits, at 10% significance level, for the Log q regressions. I cannot reject the hypothesis that the remaining coefficients are different from each other.

Regressions (5) to (8) use ROA and Excess ROA as dependent variables. I find a similar negative impact of sales-shift on performance for all distances-to-core and I find no statistically significant difference in coefficients for the 4 different levels of sales-shift.

The results of the models with Log q and Excess value provide some evidence suggesting that more value is destroyed by diversifying to more unrelated-to-the-core industries. This evidence is also consistent with the hypothesis that managers' underperformance is more severe in more unrelated-to-the-core businesses. The results with ROA and Excess ROA suggest no differences in the impact of sales-shift in performance for different distances-to-core.

1.4.3 Managerial discretion and the impact of sales-shift

So far the evidence simply suggests that non-core business activities destroy firm value. Therefore, in order to test my main hypothesis I go a step further and check if this link is different for firms with different levels of managerial discretion. This analysis helps to clarify if the lack of managerial expertise outside the core-business can be driving the previous results. If the conglomerate discount is caused by underperformance of managers outside the core-business, then conglomerates diversifying towards industries with low managerial discretion, where managers' performance is less critical, should observe no, or at least a weaker negative impact from diversification. In a similar way, companies that operate primarily in industries of low managerial discretion should present a lower effect from a shift in managers' attention towards a different business.

In order to test this hypothesis, I split my sample of firms according to the average managerial discretion score of its business segments. A firm is considered to have high managerial discretion if its average score is higher than the median score for that particular year. Table 1.5 shows the impact of total sales-shift for firms with high and low managerial discretion. In all the models I find a negative and significant effect of the interaction between sales-shift and managerial discretion score, and I find weak or no effect of sales-shift for firms with low score of managerial discretion. In my main specification, using Log q as dependent variable I find that the impact of increasing sales-shift in 10% has a negative impact in firm value of approximately 2%. This evidence is consistent with my claim that lack of managerial expertise should be more critical in industries where firm performance is more manager-dependent and that conglomerates in such industries should experience a greater discount. In addition, the positive coefficient of managerial discretion score suggests that on average the impact of managerial discretion in firm value is positive. The sign of this coefficient also helps to differentiate my interpretation of the interaction between sales-shit and managerial discretion from an alternative one linked to agency theory. The positive signal of managerial discretion coefficient is not consistent with an alternative interpretation of the previous result as being driven by agency costs of managerial discression. If the managerial discretion score is capturing agency costs then this effect should be present in non-diversified firms as well.

The impact of sales-shift to different distances-to-core-business for high and low managerial discretion firms is shown on Table 1.6. I find no impact of sales shift to any distance-to-core in low managerial discretion firms. In the main specification, for high managerial discretion firms, I find a negative impact of diversification towards business segments that are two or more digits away from the core business on Tobin's q. The strongest impact of sales-shift occurs for business segments that are 3 digits away from the core. Increasing sales weight by 10% in those segments decreases firm value by approximately 3%. These results are further evidence that the conglomerate discount might be explained by a lack of experience outside the core-business of the

firm. The most severe diversification discount is found in conglomerates with a greater proportion of its operations in unrelated-to-core-business industries that demand a lot of managerial attention. Conglomerate managers underperform stand alone managers in industries where they lack experience only if those industries are highly dependent on managerial actions.

1.4.4 Controlling for specialized firms competition effect

In this section I present the results of previous models controlling for the competition from specialized industries. Table 1.7 reports these results. Santalo and Becerra (2008) find that conglomerates perform better in industries with a smaller number of specialized firms. In order to make sure that managerial discretion index is not simply capturing a competition effect from specialize firms, considering that industries with a high degree managerial discretion are likely to have also a higher degree of specialization, I add the number of specialized players and the interaction of this variable with the diversification dummy as controls in my regression models. My previous results are robust to the inclusion of these controls. Surprisingly I find a positive and significant coefficient on the interaction of the number of specialized firms with the diversification dummy for the Excess value regressions. This is the opposite result of Santalo and Becerra (2008). A possible explanation is the fact that I am not following exactly their procedure when computing the excess value measure, because I follow Berger and Ofek (1985). When computing the theoretical q of conglomerates, defined as the sales weighted average of stand alone players' q in the industry defined at 4-digits SIC code, I impose a minimum of 5 stand alone players in the industry, otherwise I use the industry average at 3-digits level, and so forth. They do not impose this minimum number of players' restriction. Since I am excluding industries with a smaller number of stand alone firms, according to their results I am exactly dropping those industries where conglomerates do better and therefore my excess value measure will be on average lower than theirs.

1.4.5 Managerial discretion, corporate diversification and CEO compensation

Using CEO compensation I check for the validity of Hambrick and Abrahamson (1995) index of managerial discretion. I follow Rose and Shepard (1997) models for CEO compensation, including the index of managerial discretion and alternative corporate diversification measures as additional explanatory variables. Results are presented in Table 1.8 and 1.9. Regressions in table 1.8 show a positive correlation between managerial discretion and compensation, suggesting that this index is doing a good

job capturing the importance of managers for firm performance. Assuming the market for CEO talent is efficient, then more talented CEO's are allocated to industries where their skills are more valuable, and are therefore paid at a premium. Consistent with this prediction, I find in the first column of table 8 a statistically significant salary premium of 18% for high discretion firms, and in the second and third columns a premium of 16%.

For diversified firms, and contrary to the findings of Rose and Shepard (1997), I find no compensation premium. To note is the fact that I am using a more recent time period in my analysis that does not overlap with theirs and what makes it impossible to replicate their results. Following their models I use the Herfindahl index as measure of corporate diversification, but I also test these results using the diversification dummy and sales-shift. Columns one to six show the results for the diversification dummy, Herfindahl index and total sales-shift. The results are consistent with my previous predictions that no premium should be observed in CEO compensation in diversified firms if they underperform when compared to stand alone managers. These results are consistent with Laux (2001) who shows that it is cheaper to provide incentives for a manager in a conglomerate than for two managers in stand alone firms. He also predicts that the expected wage in a conglomerate should be lower than in an equivalent portfolio of stand alone firms. The results using the sales-shift measure towards different distances-to-core show a negative impact in CEO pay from diversification 2-digits away from the core, but no effect from diversification 3 or 4 digits away. In regression eight, I find a positive and significant premium (at 10% level) for 1-digit related diversification.

To summarize, the results from using CEO compensation data are consistent with my main hypothesis that lack of managerial outside the core-business explains the conglomerate discount and with the interpretation of my previous results. The results validate the score of managerial discretion and reject the existence of a CEO compensation premium in diversified firms.

1.5 Robustness tests

1.5.1 Using the full sample: 1984-2005

Table 1.10 shows the results of replicating regressions of sales-shift on firm value and performance for firms with high and low levels of managerial discretion, for the whole sample period. The results do not change and are consistent with the previous findings, suggesting that there was no impact from the change in segments report to the link between diversification and performance. The coefficients of the interaction between sales-shift and the discretion dummy are negative and significant as before for all the models, although in some of them I also find a discount for low discretion firms, that I did not find with the restricted sample. In regressions 3, 5 and 7 sales-shift coefficient

is negative and significant. I still find a stronger negative effect of diversification towards 3-digits away segments, especially when this occurs in high discretion firms. In models 4, 6 and 8 I find a discount for the most unrelated diversification irrespective of the level of discretion.

1.5.2 Using alternative estimation methods

So far all the models are estimated using firm fixed effect regressions. In this section I redo the estimation of the main models using alternative techniques. Table 1.11 shows the coefficients estimated using a pooled OLS regression, Fama Mc Beth and median regression. Pooled OLS and median regressions include year dummies to take into account eventual macro economic factors that may influence firm value. All models include industry dummies defined at 2-digit sic level to capture fixed effects within industries. Standard errors in OLS regressions are both corrected for heteroskedasticity and clustered at the firm level. The dependent variables for OLS and Fama MC Beth are the same as previously defined: the natural logarithm of Tobin's q, Excess value, ROA and Excess ROA. For median regression I use Tobin's q ratio, and Excess value defined as the difference between firm actual q and imputed q, instead of the logarithm of the ratio between q and imputed q. This is so, because by using the median regression model I expect to correct for outliers and therefore I don't need to do this correction in the dependent variable. Firm's controls are as previously defined.

Using pooled OLS estimation and median regression, I find consistent results with my previous findings. The coefficients of the interaction of sales-shift with the discretion dummy are all negative and statistically significant, with the exception of regressions 3 and 11, when ROA is used as dependent variable. In those columns I find a discount from sales-shift, but no difference for high managerial discretion firms. Using the Fama Mc Beth models I find consistent results with previous ones using log q, excess value and excess ROA, but not with ROA.

In general, the results from using these alternative estimation techniques support my previous findings. I find lower a stronger negative impact of diversification outside the core business for high discretion firms. According to these models the value loss from increasing sales outside the core-business in 10% can go up to 3.5% if those firms operate in high discretion industries.

1.5.3 Using alternative unrelatedness measure

I repeat previous tests using an alternative measure of diversification based on the measure originally developed by Fan and Lang (2000)[4] that considers how related the

[4]Fan and Lan (2000) measure of diversification designated as Intersegment Complementarity is computed as follows: $C = \sum_j (w_j \times C_{ij})$ where w_j is the proportion of the j^{th} secondary segment

periphery is to the core business. Similarly to my distance-to-core measures, Fan and Lang (2000) consider the existence of a core-business and secondary businesses in the firm although they use an alternative way to measure the relatedness between them. Relatedness is measured using commodity flow data from input-output (IO) tables from which they construct an inter-segment relatedness variable that I will use as an alternative to my distance-to-core measure.

Table 1.12 shows the results of using the adjusted Fan and Lang (2000) measure. The adjusted measure has two main differences from the pure measure. Instead of using the sales weigh of secondary segments with respect to the total secondary segments sales, I use the weigh with respect to total firm sales in order to capture the sales-shift effect. I also use the inverse of the complementary score in order to capture the unrelatedness between the core and the periphery instead of complementarity, and make it comparable to my previous analysis. By using the inverse of complementarity I also avoid having two conflicting effects in the same measure: the proportion of sales outside the core (the sales-shift), which I know to be negative and the relatedness, which I expect to be positive.[5].

I find an expected negative coefficient of the variable that is capturing the interaction between the high discretion dummy and the adjusted Fan-Lang measure of diversification. Though, the coefficient is only statistically significant in my main specification where I use firm value (measured by Log q) as dependent variable. In models 1 and 3, the diversification dummy is negative and statistically significant and therefore might be capturing some of the negative impact of diversification. There is some evidence supporting previous results from the main specification, and although no impact is observed when alternative measures of firm performance are used, the results in those models do not contradict my previous conclusions.

1.5.4 Adjusting q for Goodwill

In chapter 3 I show that mergers and acquisitions (M&A) accounting can explain a significant part of the diversification discount measured with q. The mostly used procedure of M&A accounting tends to generate a mechanical increase in the book value of assets, and therefore a drop in Tobin's q as typically measured (the market-to-book value of assets). In this section I control for the impact of M&A accounting by adjusting q and excess value for goodwill, as further discussed in chapter 3. Table 1.13

sales in the total sales of all secondary segments and C_{ij} is the complementary coefficient associated with the pair of industries to which the primary segment i and the secondary segment j belong. The complementary coefficient captures the degree to which industries i and j share the same input and output and is defined as $C_{ij} = \frac{1}{2}[corr(b_{ik}, b_{jk}) + corr(v_{ki}, v_{kj})]$ where b_{ik} is the percentage of the output of industry i supplied to each intermediate industry k and v_{ki} the dollor value of industry k's output required to produce 1 dollar's worth of industry i's total output.

[5]The samples in these regressions result from merging Fan & Lan (2000) sample with my previous sample. The data on complementarity coefficients is provided by the authors.

shows the results. The dependent variable in all regressions are adjusted for goodwill: Log q adjusted is the log of the ratio between market value of assets and adjusted book value of assets, where adjusted book value of assets is the book value of assets minus goodwill. Excess-value - adjusted corresponds to the excess-value measure where q is adjusted for goodwill as defined above.

The results do not contradict the previous conclusions, and are also consistent with the findings in chapter 3. On average I find that the decision to become diversified, as captured by the diversification dummy, has a is positive and significant effect on q and excess value. The coefficient of the diversification dummy has a value between 0.48 and 0.55 and is significant at least at 10% level in all regressions except for specification 7. However, on the cross section and on top of the decision to diversify, I find a negative impact from diversifying further away from the core-business.

According to the results in specifications 1 and 2, the overall impact of diversification on q and excess value can be positive as long as the non-core activities (sales-shift) have a weight of less than 38% and 28%, respectively. In that case the positive effect of the diversification dummy dominates the negative impact of unrelated diversification. Specifications 3 and 4 show that the negative effect of non-core activities are mainly driven from segments that are 3 and 4 digits away from the core-business, as previously reported. The results in specification 4 suggest that 18% of sales in secondary segment 3 digits away from the core-business are enough to offset the positive coefficient of the diversification dummy.

Columns 5 to 8 show the results from classifying the firms into high and low levels of managerial discretion. The results in specifications 5 and 7 are in line with the ones in the previous analysis. I find a stronger negative impact from diversifying way from the core-business when the firm is operating in high managerial discretion industries. This effect is statistically significant when using log q as dependent variable. However, when excess value is used as dependent variable, I still find a negative overall impact from diversifying in high managerial discretion industries, but the coefficient on the interaction term is not precisely estimated.

The results reported in table 1.13 suggest that correcting q for goodwill do not offset the cross-sectional variation associated with the distance-to-core business. This correction shifts the average diversification discount to the right, but a negative effect from unrelated-to-the-core diversification is maintained.

1.5.5 Conclusion

This paper tests an additional and at same time very intuitive explanation for why diversification outside the core-business destroys value based on the lack of managerial expertise. I develop a set of diversification measures that capture both the weight of non-core-business activities and the distance between such activities and the core-

business. I find significant evidence consistent with the claim that if managers diversify towards unrelated-to-the-core business segments, they will have limited ability to run these new businesses, underperforming stand alone firms in the same industries and, consequently, destroying firm value. This argument is supported by the fact that increasing non-core business activity (sales-shift) has much stronger negative impact if the company operates in industries of high managerial discretion. I validate the measure of managerial discretion and previous results on the conglomerate discount using CEO compensation data. My main results are robust to different estimation methods, alternative definitions of firm value and performance and an alternative measure of sale-shift and unrelatedness.

1.6 Figures and tables

Figure 1.1: Average Sales-shift 1984-2005

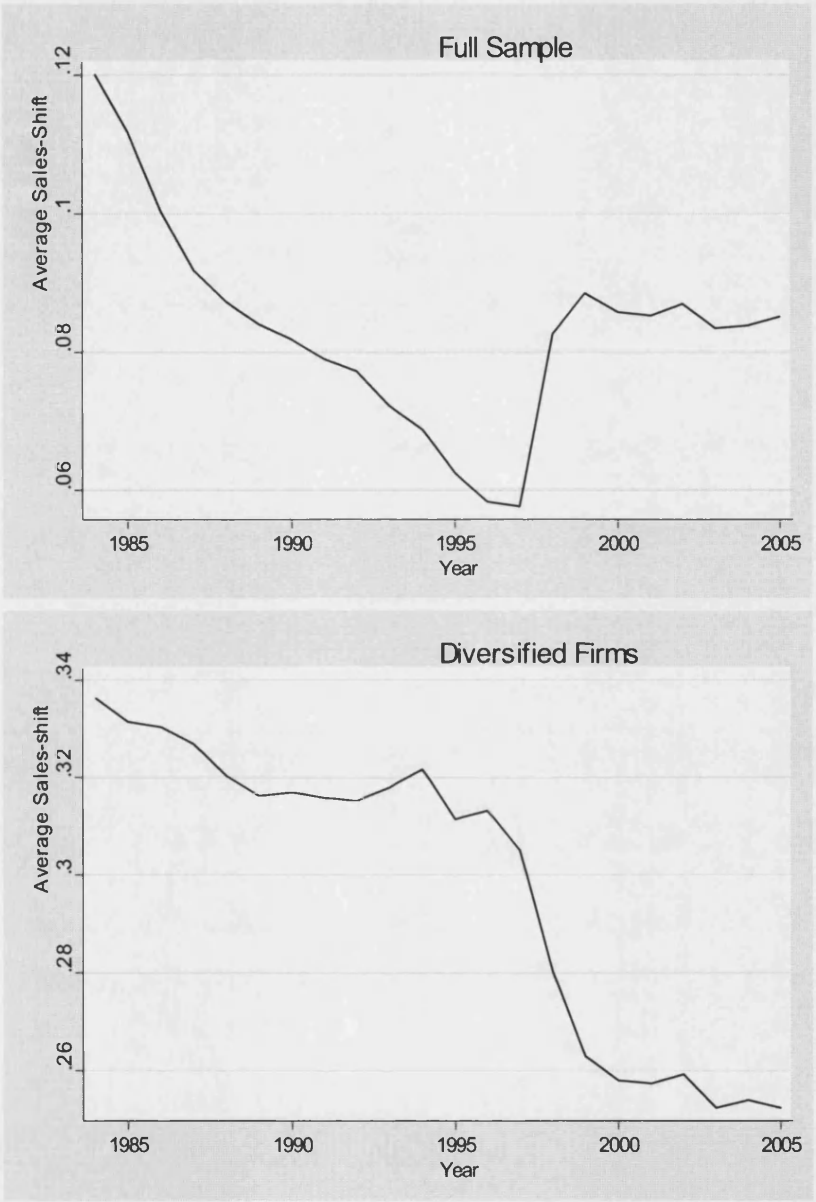

Figure 1.2: Average levels of Distance-to-core (1984-2005)

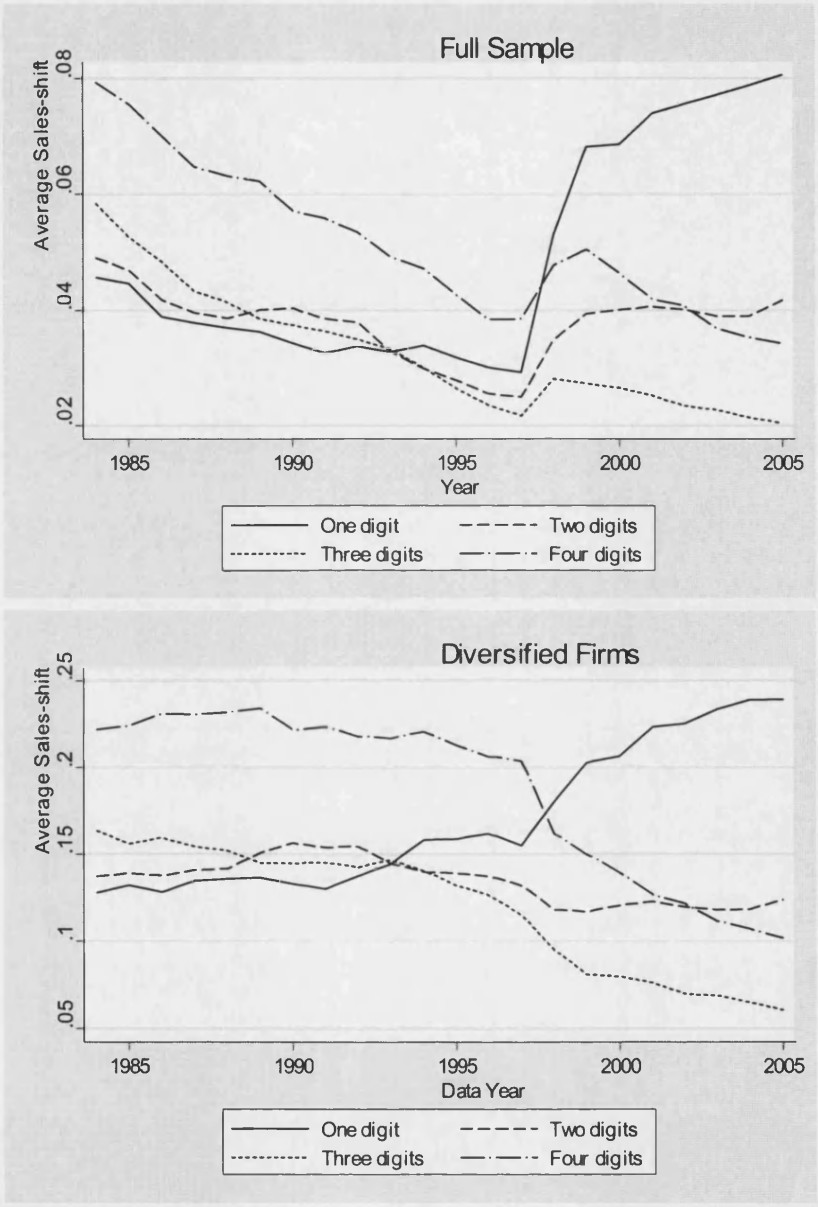

Table 1.1: Summary of financial, diversification and compensation variables

Table 1.1 presents the descriptive statistics for the full sample, and for the sub sample of diversified US-based publicly traded firms. The full sample consists of 48,171 firm-years of data during the period 1984 to 1998. Sales-shift is the percentage of business segments' sales that do not correspond to the core business of the firm. The core business of the firm is defined as the business segment with the highest sales. Sales-shift N digit(s) is the proportion of sales in business segments for wich SIC code is N digits away from the core-business. The distance N will assume a value of 1 if the segment's SIC code differs from the core business SIC code in the 4^{th} digit and not in the 1^{st}, 2^{nd} or 3^{rd}, a value of 2 if the segment's SIC code differs from the core business SIC code in the 3^{rd} digit and not in the 1^{st} or 2^{nd}, a value of 3 if the segment's SIC code differs from the core business SIC code in the 2^{nd} digit and not in the 1^{st} and finally a value of 4, if the segment's SIC code differs from the core business SIC code in the 1^{st} digit. Tobin's q is defined as the ratio between the market value of assets and the book value of assets, being the market value of assets defined as the book value of assets less the book value of equity plus the market value of equity. Excess value is the log of the ratio between Tobin's Q and imputed Q. ROA is defined as earnings before interest and taxes divided by total assets. Excess ROA is the diference between ROA and imputed ROA. Ebit-to-sales corresponds to earnings before interest and taxes divided by total sales. Capex-to-sales is capital expenditures divided by total sales. Leverage is the ratio between total debt and total assets. Discretion score is the sales-weighted average discretion score of the business segments. Total CEO compensation includes salary, bonus, stocks and stock options. CEO tenure is the number of years of the CEO in the position. Age at appointment is the CEO age at the start date of CEO position. Outside Hire is a dummy equal to one if the CEO is appointed from outside the firm. N is the number of non missing observations.

	Mean	St. Dev.	Min	Max	N
	Panel A - Full sample				
Assets (millions of dollars)	1,105.35	3,348.89	1.75	40,585.00	48,171
Sales (millions of dollars)	1,044.50	3,195.47	20.00	104,859.00	48,171
Tobin's q	1.695	1.198	0.554	16.232	48,171
Excess value	-0.001	0.417	-1.207	2.004	48,171
Ebit-to-assets (ROA)	0.126	0.116	-1.953	0.382	48,171
Excess ROA	0.021	0.119	-2.113	0.818	48,171
Ebit-to-sales	0.078	0.120	-2.930	0.338	48,171
Capex-to-sales	0.094	0.163	0.000	2.722	48,171
Debt-to-assets	0.198	0.179	0.000	0.930	48,171
No of segments	1.583	1.101	1.000	10.000	48,171
Diversification dummy	0.296	0.457	0.000	1.000	48,171
Sales-shift	0.098	0.180	0.000	0.835	48,171
Sales-shift - 1 digit	0.006	0.041	0.000	0.655	48,171
Sales-shift - 2 digits	0.019	0.076	0.000	0.718	48,171
Sales-shift - 3 digits	0.031	0.102	0.000	0.811	48,171
Sales-shift - 4 digits	0.042	0.116	0.000	0.829	48,171
Discretion score	4.945	1.123	2.080	6.890	41,539
Total Ceo Compensation	2,436.84	4,777.53	0.000	202,185.10	4,511
Ceo Tenure	8.225	7.674	1.000	52.000	4,511
Age at appointment	54.137	7.617	29.000	82.000	4,511
Outside hired Ceo	0.200	0.400	0.000	1.000	4,511
	Panel B - Diversified firms				
Assets (millions of dollars)	2,077.75	4,598.82	3.49	40,585.00	14,278
Sales (millions of dollars)	1,941.65	4,374.04	20.00	104,859.00	14,278
Tobin's q	1.423	0.729	0.559	13.305	14,278
Excess value	-0.062	0.345	-1.207	2.001	14,278
Ebit-to-assets (ROA)	0.126	0.082	-0.883	0.382	14,278
Excess ROA	0.021	0.090	-1.022	0.663	14,278
Ebit-to-sales	0.079	0.082	-0.942	0.338	14,278
Capex-to-sales	0.092	0.143	0.000	2.356	14,278
Debt-to-assets	0.224	0.163	0.000	0.929	14,278
No of segments	2.965	1.172	2.000	10.000	14,278
Diversification dummy	1.000	0.000	1.000	1.000	14,278
Sales-shift	0.330	0.179	0.000	0.835	14,278
Sales-shift - 1 digit	0.019	0.073	0.000	0.655	14,278
Sales-shift - 2 digits	0.065	0.129	0.000	0.718	14,278
Sales-shift - 3 digits	0.106	0.165	0.000	0.811	14,278
Sales-shift - 4 digits	0.140	0.178	0.000	0.829	14,278
Discretion score	4.765	1.100	2.080	6.890	13,460
Total Ceo Compensation	2,790.05	6,362.72	0.00	202,185.10	1,541
Ceo Tenure	7.98	7.77	1.00	52.00	1,541
Age at appointment	55.78	7.01	34.00	79.00	1,541
Outside hired Ceo	0.123	0.328	0.000	1.000	1,541

Table 1.2: Correlation matrices - full sample and diversified firms

Table 1.2 shows the correlation between firm characteristics and diversification variables for the full sample and for the sub sample of diversified firms. All variables are defined in Table 1. N is the number of non missing observations.

	Log q	Excess value	ROA	Excess ROA	Log assets	Ebit-to-sales	Capex-to-sales	Debt-to-assets	Div dummy	Sales-shift	Sales-shift1	Sales-shift2	Sales-shift3	Sales-shift4	Disc. score
	Panel A - Full sample (obs=41,539)														
Log q	1.00														
Excess value	0.80	1.00													
Ebit-to-assets (ROA)	0.31	0.33	1.00												
Excess ROA	0.34	0.29	0.88	1.00											
Log assets	-0.06	0.02	0.12	0.09	1.00										
Ebit-to-sales	0.31	0.32	0.96	0.85	0.12	1.00									
Capex-to-sales	0.01	0.05	-0.03	-0.01	0.17	-0.07	1.00								
Debt-to-assets	-0.25	-0.13	-0.09	-0.11	0.25	-0.10	0.22	1.00							
Diversification dummy	-0.18	-0.10	0.00	-0.01	0.28	0.00	-0.02	0.11	1.00						
Sales-shift	-0.16	-0.10	0.01	-0.01	0.30	0.01	-0.04	0.09	0.83	1.00					
Sales-shift - 1 digit	-0.02	-0.02	0.00	0.00	0.07	0.00	-0.01	0.01	0.20	0.24	1.00				
Sales-shift - 2 digits	-0.07	-0.04	0.02	0.01	0.21	0.02	0.01	0.06	0.38	0.44	0.01	1.00			
Sales-shift - 3 digits	-0.11	-0.05	0.01	-0.01	0.14	0.02	-0.06	0.02	0.47	0.58	0.02	0.02	1.00		
Sales-shift - 4 digits	-0.10	-0.07	-0.02	-0.01	0.18	-0.02	-0.01	0.07	0.55	0.65	0.00	0.01	-0.01	1.00	
Discretion score	0.18	-0.03	0.00	0.05	-0.27	0.05	-0.29	-0.22	-0.11	-0.06	0.01	-0.05	-0.03	-0.03	1.00
	Panel B - Diversified firms (obs=13,460)														
Log q	1.00														
Excess value	0.77	1.00													
Ebit-to-assets (ROA)	0.35	0.31	1.00												
Excess ROA	0.34	0.23	0.83	1.00											
Log assets	0.08	0.10	0.17	0.12	1.00										
Ebit-to-sales	0.35	0.31	0.95	0.78	0.17	1.00									
Capex-to-sales	0.03	0.06	-0.03	-0.01	0.14	-0.09	1.00								
Debt-to-assets	-0.15	-0.08	-0.09	-0.11	0.17	-0.10	0.22	1.00							
Diversification dummy	.	.	.	.	.	.	.	.	.						
Sales-shift	-0.05	-0.06	0.03	0.00	0.20	0.04	-0.07	-0.02	.	1.00					
Sales-shift - 1 digit	0.03	-0.01	0.00	0.01	0.02	0.01	0.00	-0.02	.	0.13	1.00				
Sales-shift - 2 digits	0.01	0.00	0.05	0.03	0.19	0.06	0.04	0.03	.	0.24	-0.07	1.00			
Sales-shift - 3 digits	-0.07	-0.02	0.05	0.00	0.01	0.05	-0.10	-0.07	.	0.39	-0.09	-0.20	1.00		
Sales-shift - 4 digits	0.00	-0.04	-0.05	-0.02	0.05	-0.06	0.00	0.03	.	0.43	-0.14	-0.25	-0.37	1.00	
Discretion score	0.13	-0.08	0.03	0.06	-0.23	0.08	-0.28	-0.17	.	0.12	0.06	-0.01	0.04	0.06	1.00

Table 1.3: Fixed effects regressions of Sales-shift on firm value and performance

Table 3 shows the impact of sales-shift on firm value and performance. The dependent variable in regressions (1) and (2) is the natural logarithm of Tobin's q, defined as the ratio between the market value of assets and the book value of assets, being the market value of assets defined as the book value of assets less the book value of equity plus the market value of equity. The dependent variable in regressions (3) and (4) is Excess Value, defined as the log of the ratio between Tobin's q and imputed q. The dependent variable in regressions (5) and (6) is ROA, defined as EBIT to assets. The dependent variable in regressions (7) and (8) is Excess ROA, defined as the difference between ROA and imputed ROA. Sales-shift is the proportion of firm sales that do not correspond to the core business. The core business of the firm is defined as the business segment with the highest sales. The diversification dummy is a variable set to one if a firm reports more than one business segment and zero otherwise. Size defined as log of total assets, Ebit-to-sales, Capex-to-sales and leverage are inlcuded as controls. All regressions include firm fixed effects and year dummies. T-statistics are reported in parenthesis and standard errors are corrected for heteroskedasticity. N is the number of non missing observations.

Dep. variable	Log q	Log q	Exc value	Exc value	ROA	ROA	Exc ROA	Exc ROA
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Sales-shift	-0.092	-0.089	-0.112	-0.102	-0.026	-0.030	-0.027	-0.026
	[-3.74]	[-2.92]	[-4.35]	[-3.24]	[-3.80]	[-3.62]	[-3.62]	[-2.94]
Div. dummy		-0.002		-0.006		0.002		0.000
		[-0.18]		[-0.47]		[0.59]		[0.13]
Log assets	-0.104	-0.104	-0.106	-0.106	0.009	0.009	0.011	0.010
	[-15.2]	[-15.2]	[-16.0]	[-15.9]	[4.15]	[4.13]	[4.96]	[4.80]
Ebit-to-sales	1.067	1.067	0.894	0.894				
	[16.7]	[16.7]	[15.6]	[15.6]				
Capex-to-sales	0.157	0.157	0.094	0.094	-0.035	-0.035	-0.037	-0.036
	[9.00]	[9.00]	[5.69]	[5.69]	[-8.17]	[-8.17]	[-8.50]	[-8.60]
Debt-to-assets	-0.211	-0.211	-0.150	-0.150	-0.080	-0.080	-0.066	-0.066
	[-9.84]	[-9.84]	[-7.31]	[-7.31]	[-11.1]	[-11.1]	[-9.34]	[-9.42]
N	48,171	48,171	48,171	48,171	48,171	48,171	48,171	48,171
No. of firms	8,208	8,208	8,208	8,208	8,208	8,208	8,208	8,208
R-squared	0.18	0.18	0.13	0.13	0.03	0.03	0.03	0.03

Robust t statistics in brackets

Table 1.4: Fixed effects regressions of Sales-shift on firm value and performance for different distances-to-core-business.

This table shows the results of replicating the models in table 4 using Sales-shift to four different distances-to-core. The distance-to-core will assume a value of 1 if the segment's SIC code differs from the core business SIC code in the 4^{th} digit and not in the 1^{st}, 2^{nd} or 3^{rd}, a value of 2 if the segment's SIC code differs from the core business SIC code in the 3^{rd} digit and not in the 1^{st} or 2^{nd}, a value of 3 if the segment's SIC code differs from the core business SIC code in the 2^{nd} digit and not in the 1^{st} and finally a value of 4, if the segment's SIC code differs from the core business SIC code in the 1^{st} digit. All regressions are firm fixed effect regressions and include year dummies. T-statistics are reported in parenthesis and standard errors are corrected for heteroskedasticity. N is the number of non missing observations.

Dep. variable	Log q	Log q	Exc value	Exc value	ROA	ROA	Exc ROA	Exc ROA
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Sales-shift 1 digit	0.003	0.007	-0.038	-0.028	-0.045	-0.048	-0.050	-0.051
	[0.042]	[0.090]	[-0.55]	[-0.40]	[-2.17]	[-2.33]	[-2.46]	[-2.45]
Sales-shift 2 digits	-0.099	-0.096	-0.113	-0.103	-0.009	-0.013	-0.015	-0.016
	[-2.19]	[-1.96]	[-2.39]	[-2.04]	[-0.83]	[-1.07]	[-1.19]	[-1.15]
Sales-shift 3 digits	-0.144	-0.141	-0.158	-0.148	-0.029	-0.032	-0.034	-0.035
	[-4.17]	[-3.54]	[-4.28]	[-3.52]	[-3.07]	[-3.09]	[-3.50]	[-3.13]
Sales-shift 4 digits	-0.072	-0.068	-0.094	-0.085	-0.027	-0.031	-0.022	-0.022
	[-2.23]	[-1.89]	[-2.85]	[-2.28]	[-2.95]	[-2.99]	[-2.16]	[-1.97]
Div. dummy		-0.002		-0.006		0.002		0.000
		[-0.18]		[-0.46]		[0.62]		[0.092]
Log assets	-0.104	-0.104	-0.106	-0.106	0.009	0.009	0.011	0.011
	[-15.2]	[-15.2]	[-15.9]	[-15.9]	[4.15]	[4.13]	[4.95]	[4.95]
Ebit-to-sales	1.067	1.067	0.894	0.894				
	[16.7]	[16.7]	[15.6]	[15.6]				
Capex-to-sales	0.157	0.157	0.094	0.094	-0.035	-0.035	-0.037	-0.037
	[9.00]	[9.00]	[5.69]	[5.68]	[-8.16]	[-8.16]	[-8.49]	[-8.49]
Debt-to-assets	-0.211	-0.211	-0.150	-0.150	-0.080	-0.080	-0.066	-0.066
	[-9.84]	[-9.84]	[-7.31]	[-7.31]	[-11.1]	[-11.1]	[-9.34]	[-9.34]
N	48,171	48,171	48,171	48,171	48,171	48,171	48,171	48,171
No. of firms	8,208	8,208	8,208	8,208	8,208	8,208	8,208	8,208
R-squared	0.18	0.18	0.13	0.13	0.03	0.03	0.03	0.03

Robust t statistics in brackets

Table 1.5: Fixed effects regressions of sales-shift on firm value and performance for high and low levels of managerial discretion.

Table 5 shows the results of regressing sales-shift on firm value and performance for firms with high and low scores of managerial discretion. High disc. dummy is one if the firm discretion score is higher than the median score for a particular year, a zero otherwise. Firm discretion score is a sales-weighted average of business segments' industry discretion score. High. disc*Sales-shift is the interaction of sales-shift with the discretion dummy. All regressions include year dummies and the same controls as in table 3. T-statistics are reported in parenthesis and standard errors are corrected for heteroskedasticity. N is the number of non missing observations.

Dep. variable	Log q	Log q	Exc value	Exc value	ROA	ROA	Exc ROA	Exc ROA
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
High disc.*Sales-shift	-0.180	-0.180	-0.082	-0.081	-0.021	-0.021	-0.028	-0.028
	[-4.29]	[-4.29]	[-1.88]	[-1.88]	[-1.94]	[-1.95]	[-2.40]	[-2.41]
High disc. dummy	0.082	0.082	0.017	0.017	0.006	0.006	0.010	0.010
	[4.32]	[4.32]	[0.85]	[0.85]	[1.34]	[1.34]	[1.84]	[1.84]
Sales-shift	-0.007	-0.007	-0.060	-0.050	-0.010	-0.016	-0.007	-0.013
	[-0.22]	[-0.19]	[-1.86]	[-1.33]	[-1.29]	[-1.73]	[-0.78]	[-1.27]
Div. dummy		-0.000		-0.006		0.003		0.004
		[-0.0032]		[-0.46]		[0.93]		[0.97]
Log assets	-0.108	-0.108	-0.111	-0.111	0.010	0.010	0.012	0.011
	[-14.5]	[-14.5]	[-15.6]	[-15.6]	[4.18]	[4.16]	[5.06]	[5.04]
Ebit-to-sales	1.063	1.063	0.905	0.905				
	[15.0]	[15.0]	[14.2]	[14.2]				
Capex-to-sales	0.149	0.149	0.088	0.087	-0.034	-0.034	-0.036	-0.036
	[8.13]	[8.12]	[5.15]	[5.15]	[-7.63]	[-7.63]	[-8.07]	[-8.07]
Debt-to-assets	-0.212	-0.212	-0.146	-0.146	-0.077	-0.077	-0.064	-0.064
	[-9.06]	[-9.06]	[-6.52]	[-6.52]	[-9.92]	[-9.92]	[-8.40]	[-8.40]
N	41,539	41,539	41,539	41,539	41,539	41,539	41,539	41,539
No. of firms	7,143	7,143	7,143	7,143	7,143	7,143	7,143	7,143
R-squared	0.18	0.18	0.14	0.14	0.03	0.03	0.03	0.03

Robust t statistics in brackets

Table 1.6: Fixed effects regressions of Sales-shift towards different distances-to-core for high and low managerial discretion firms.

This table shows the results of regressing sales-shift towards different distances-to-core on firm value and performance for firms with high and low scores of managerial discretion. High disc. dummy is one if the firm discretion score is higher than the median score for a particular year, a zero otherwise. Firm discretion score is a sales-weighted average of business segments' industry discretion score. High. disc*Sales-shift is the interaction of sales-shift with the discretion dummy. All regressions include year dummies and the same controls as in table 3. T-statistics are reported in parenthesis and standard errors are corrected for heteroskedasticity. N is the number of non missing observations.

Dep. variable	Log q	Log q	Exc value	Exc value	ROA	ROA	Exc ROA	Exc ROA
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
H disc.*Sales shift 1	-0.224	-0.224	-0.012	-0.013	-0.034	-0.034	-0.047	-0.046
	[-1.55]	[-1.55]	[-0.084]	[-0.089]	[-0.92]	[-0.91]	[-1.26]	[-1.25]
H disc.*Sales shift 2	-0.140	-0.140	-0.094	-0.095	-0.034	-0.033	-0.036	-0.035
	[-1.66]	[-1.66]	[-1.05]	[-1.05]	[-1.69]	[-1.68]	[-1.53]	[-1.52]
H disc.*Sales shift 3	-0.277	-0.277	-0.153	-0.153	-0.036	-0.036	-0.045	-0.045
	[-5.10]	[-5.10]	[-2.67]	[-2.67]	[-2.58]	[-2.58]	[-3.00]	[-3.00]
H disc.*Sales shift 4	-0.122	-0.122	-0.038	-0.037	-0.003	-0.003	-0.007	-0.007
	[-2.25]	[-2.24]	[-0.66]	[-0.65]	[-0.17]	[-0.19]	[-0.43]	[-0.46]
High disc. dummy	0.084	0.084	0.019	0.019	0.006	0.006	0.009	0.009
	[4.45]	[4.45]	[0.95]	[0.95]	[1.31]	[1.31]	[1.78]	[1.78]
Sales-shift 1 digit	0.147	0.148	-0.018	-0.006	-0.018	-0.024	-0.023	-0.029
	[1.33]	[1.33]	[-0.15]	[-0.048]	[-0.70]	[-0.93]	[-0.92]	[-1.16]
Sales-shift 2 digits	-0.050	-0.049	-0.065	-0.054	0.005	0.000	-0.001	-0.007
	[-0.85]	[-0.80]	[-1.00]	[-0.80]	[0.37]	[-0.012]	[-0.089]	[-0.44]
Sales-shift 3 digits	-0.010	-0.009	-0.061	-0.051	-0.004	-0.009	-0.006	-0.012
	[-0.23]	[-0.18]	[-1.39]	[-1.02]	[-0.36]	[-0.78]	[-0.52]	[-0.91]
Sales-shift 4 digits	-0.013	-0.012	-0.067	-0.057	-0.019	-0.024	-0.010	-0.016
	[-0.35]	[-0.29]	[-1.70]	[-1.32]	[-1.91]	[-2.18]	[-0.90]	[-1.24]
Div. dummy		-0.001		-0.007		0.003		0.003
		[-0.058]		[-0.49]		[0.90]		[0.90]
Log assets	-0.108	-0.108	-0.111	-0.111	0.010	0.010	0.013	0.013
	[-14.5]	[-14.5]	[-15.6]	[-15.6]	[4.23]	[4.22]	[5.14]	[5.13]
Ebit-to-sales	1.063	1.063	0.904	0.905				
	[15.0]	[15.0]	[14.2]	[14.2]				
Capex-to-sales	0.149	0.149	0.087	0.087	-0.034	-0.034	-0.037	-0.037
	[8.11]	[8.11]	[5.15]	[5.14]	[-7.61]	[-7.61]	[-7.97]	[-7.97]
Debt-to-assets	-0.212	-0.212	-0.146	-0.146	-0.076	-0.076	-0.064	-0.064
	[-9.05]	[-9.05]	[-6.52]	[-6.52]	[-9.79]	[-9.79]	[-8.29]	[-8.29]
N	41,539	41,539	41,539	41,539	41,539	41,539	41,539	41,539
No. of firms	7,143	7,143	7,143	7,143	7,143	7,143	7,143	7,143
R-squared	0.18	0.18	0.14	0.14	0.03	0.03	0.03	0.03

Robust t statistics in brackets

Table 1.7: Fixed effects regressions of Sales-shift on firm value and performance controling for the number of specialized players in the industry.

This table shows the results of regressing total sales-shift and sales-shift towards different distances-to-core on firm value and performance, for firms with high and low scores of managerial discretion, controling for the number of stand alone players in the industry. NSC is the number of specialized companies in the industry. NSC*Div. dummy is the interaction of the number of specialized firms in the industry with the diversification dummy. All regressions include year dummies and the same controls as in table 3. T-statistics are reported in parenthesis and standard errors are corrected for heteroskedasticity. N is the number of non missing observations.

Dep. variable	Log q	Log q	Exc value	Exc value	ROA	ROA	Exc ROA	Exc ROA
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
High disc.*Sales shift	-0.178		-0.082		-0.021		-0.027	
	[-4.24]		[-1.90]		[-1.92]		[-2.32]	
Sales-shift	-0.002		-0.049		-0.015		-0.013	
	[-0.066]		[-1.29]		[-1.68]		[-1.29]	
H disc.*Sales shift 1		-0.215		-0.024		-0.034		-0.042
		[-1.51]		[-0.17]		[-0.92]		[-1.16]
H disc.*Sales shift 2		-0.134		-0.093		-0.032		-0.034
		[-1.59]		[-1.03]		[-1.61]		[-1.47]
H disc.*Sales shift 3		-0.279		-0.148		-0.036		-0.046
		[-5.13]		[-2.61]		[-2.55]		[-3.08]
H disc.*Sales shift 4		-0.120		-0.041		-0.003		-0.006
		[-2.20]		[-0.73]		[-0.21]		[-0.38]
Sales-shift 1 digit		0.142		0.008		-0.023		-0.033
		[1.27]		[0.064]		[-0.89]		[-1.32]
Sales-shift 2 digits		-0.046		-0.053		0		-0.006
		[-0.75]		[-0.79]		[0.027]		[-0.41]
Sales-shift 3 digits		-0.002		-0.052		-0.008		-0.01
		[-0.042]		[-1.05]		[-0.71]		[-0.77]
Sales-shift 4 digits		-0.008		-0.055		-0.023		-0.015
		[-0.19]		[-1.27]		[-2.10]		[-1.18]
High disc. dummy	0.082	0.0849	0.016	0.018	0.006	0.006	0.010	0.010
	[4.34]	[4.47]	[0.83]	[0.91]	[1.33]	[1.31]	[1.85]	[1.83]
Div. dummy	-0.007	-0.007	-0.085	-0.085	-0.008	-0.008	0.013	0.014
	[-0.30]	[-0.29]	[-3.19]	[-3.17]	[-1.12]	[-1.12]	[1.64]	[1.66]
NSC	0.01	0.0103	-0.040	-0.040	-0.004	-0.004	0.009	0.009
	[1.17]	[1.19]	[-4.29]	[-4.27]	[-1.48]	[-1.45]	[3.05]	[3.09]
NSCDiv. dummy	0.006	0.006	0.026	0.026	0.004	0.004	-0.002	-0.002
	[0.71]	[0.67]	[2.89]	[2.86]	[1.69]	[1.68]	[-0.80]	[-0.80]
Log assets	-0.108	-0.108	-0.109	-0.109	0.010	0.010	0.012	0.012
	[-14.5]	[-14.5]	[-15.1]	[-15.1]	[4.32]	[4.29]	[4.92]	[4.89]
Ebit-to-sales	1.064	1.064	0.902	0.902				
	[15.0]	[15.0]	[14.2]	[14.2]				
Capex-to-sales	0.148	0.148	0.087	0.087	-0.034	-0.034	-0.037	-0.037
	[8.08]	[8.07]	[5.16]	[5.15]	[-7.63]	[-7.63]	[-8.01]	[-8.01]
Debt-to-assets	-0.212	-0.212	-0.146	-0.146	-0.077	-0.076	-0.064	-0.064
	[-9.06]	[-9.05]	[-6.57]	[-6.56]	[-9.81]	[-9.80]	[-8.28]	[-8.27]
N	41,539	41,539	41,539	41,539	41,539	41,539	41,539	41,539
No. of firms	7,143	7,143	7,143	7,143	7,143	7,143	7,143	7,143
R-squared	0.18	0.18	0.14	0.14	0.03	0.03	0.03	0.03

Robust t statistics in brackets

Table 1.8: Regressions of managerial discretion index on CEO compensation

This table presents OLS regressions of managerial discretion index on managerial compensation. The dependent variable in all regressions is the logarithm of total compensation, including salary, bonus, total value of stocks granted and total value of stock options granted. Log sales is defined as the natural logarithm of total firm sales. Log employes is defined as the natural logarithm of the total number of employes. Stock return is the annual stock return. Accounting return corresponds to return on equity, defined as net income divided by total shareholders equity. Stock return volatility is the standard deviation of stock returns. Ceo tenure is the number of years as CEO in the firm. Ceo age at appointment is the CEO age at the start date in the CEO position. Outsid hired dummy is a variable that assumes the value one, if the CEO is hired from outside the firm. T-statistics are reported in parenthesis. All regressions include year dummies. Standard errors are corrected for heteroskedasticity. N is the number of non missing observations.

	(1)	(2)	(3)
High disc. dummy	0.177	0.155	0.155
	[6.36]	[4.11]	[4.12]
Log sales	0.391	0.428	0.386
	[36.8]	[28.9]	[12.4]
Log employes			0.044
			[1.50]
Stock return	0.003	0.003	0.003
	[7.76]	[6.26]	[6.27]
Stock return t-1	0.003	0.002	0.002
	[7.79]	[4.56]	[4.60]
Stock return t-2		0.002	0.002
		[4.72]	[4.76]
Accounting return		0.001	0.001
		[0.45]	[0.47]
Accounting return t-1		0.001	0.001
		[0.49]	[0.50]
Accounting return t-2		-0.001	-0.001
		[-0.50]	[-0.52]
Stock return volatility		0.883	0.850
		[4.79]	[4.59]
Ceo tenure	0.000	0.000	-0.002
	[0.13]	[-0.39]	[-0.60]
Ceo age at apointment	-0.002	0.002	0.003
	[-0.81]	[0.71]	[0.78]
Outside hire dummy	0.178	0.119	0.121
	[4.27]	[2.16]	[2.20]
Constant	4.395	3.605	3.822
	[31.2]	[14.9]	[13.9]
N	2,892	1,757	1,757
R-squared	0.37	0.39	0.39

Robust t statistics in brackets

Table 1.9: Regressions of corporate diversification measures on CEO compensation

This table presents OLS regressions of corporate diversification measures on managerial compensation. The dependent variable in all regressions is the logarithm of total compensation, including salary, bonus, total value of stocks granted and total value of stock options. Diversification dummy and Sales-shift are as defined in Table 1. The Herfindahl index of diversification is $H = \sum_i P_i^2$ where P_i is the proportion of a firm's assets in industry i. Industries are defined at 4-digits SIC level. Control variables are as defined in table 8. Standard errors are corrected for heteroskedasticity. N is the number of non missing observations.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Div. dummy	0.000	0.025						
	[0.012]	[0.64]						
1 - Herfindahl index			0.051	0.110				
			[0.97]	[1.49]				
Sales-shift					0.004	0.052		
					[0.064]	[0.57]		
Sales-shift 1 digit							0.373	0.582
							[1.56]	[1.69]
Sales-shift 2 digits							-0.501	-0.459
							[-3.56]	[-2.42]
Sales-shift 3 digits							0.098	0.031
							[0.98]	[0.25]
Sales-shift 4 digits							0.101	0.205
							[1.09]	[1.61]
Log sales	0.438	0.456	0.435	0.456	0.438	0.456	0.438	0.456
	[38.7]	[11.8]	[38.0]	[11.9]	[38.6]	[11.8]	[38.6]	[11.8]
Log employes		0.006		0.003		0.006		0.007
		[0.16]		[0.081]		[0.16]		[0.17]
Stock return	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
	[7.23]	[6.23]	[7.22]	[6.23]	[7.23]	[6.23]	[7.19]	[6.19]
Stock return t-1	0.003	0.002	0.003	0.002	0.003	0.002	0.003	0.002
	[6.40]	[3.93]	[6.42]	[3.92]	[6.40]	[3.92]	[6.37]	[3.91]
Stock return t-2		0.002		0.002		0.002		0.002
		[3.81]		[3.84]		[3.80]		[3.83]
Accounting return		0.000		0.000		0.000		0.000
		[0.002]		[-0.007]		[0.009]		[-0.039]
Accounting return t-1		0.000		0.000		0.000		0.000
		[0.28]		[0.29]		[0.28]		[0.26]
Accounting return t-2		-0.001		-0.001		-0.001		-0.001
		[-0.72]		[-0.71]		[-0.73]		[-0.79]
Stock return volatility		0.567		0.585		0.567		0.543
		[2.74]		[2.83]		[2.72]		[2.59]
Ceo tenure	0.001	-0.001	0.001	0.000	0.001	0.000	0.000	-0.001
	[0.25]	[-0.19]	[0.26]	[-0.17]	[0.25]	[-0.18]	[0.040]	[-0.44]
Ceo age at apointment	-0.002	0.001	-0.002	0.001	-0.002	0.001	-0.002	0.002
	[-0.82]	[0.30]	[-0.86]	[0.27]	[-0.82]	[0.30]	[-0.66]	[0.47]
Outside hire dummy	0.179	0.169	0.181	0.171	0.179	0.169	0.184	0.175
	[4.39]	[3.19]	[4.44]	[3.23]	[4.40]	[3.20]	[4.51]	[3.30]
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	2,892	1,757	2,892	1,757	2,892	1,757	2,892	1,757
R-squared	0.47	0.49	0.47	0.49	0.47	0.49	0.48	0.49

Robust t statistics in brackets

Table 1.10: Regressions of sales-shift on firm value and performance for the full sample: 1984-2005

This table presents the robustness tests results of using the full sample of firms, from 1984 to 2005, ignoring the change in segments reporting. I replicate here the models in tables 5 and 6 for the whole period. All regressions include year dummies. T-statistics are reported in parenthesis. Standard errors are corrected for heteroskedasticity. N is the number of non missing observations.

Dep. variable	Log q	Log q	Exc value	Exc value	ROA	ROA	Exc ROA	Exc ROA
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
High disc.*Sales shift	-0.175		-0.091		-0.022		-0.025	
	[-4.31]		[-2.19]		[-2.35]		[-1.97]	
Sales-shift	-0.049		-0.068		-0.025		-0.022	
	[-1.62]		[-2.07]		[-3.35]		[-2.41]	
High disc.*Sales shift 1		-0.042		-0.05		-0.041		0.032
		[-0.36]		[-0.41]		[-1.60]		[0.95]
High disc.*Sales shift 2		-0.208		-0.162		-0.034		-0.006
		[-2.78]		[-1.99]		[-1.85]		[-0.19]
High disc.*Sales shift 3		-0.314		-0.143		-0.039		-0.072
		[-5.27]		[-2.33]		[-2.89]		[-4.36]
High disc.*Sales shift 4		-0.099		-0.043		-0.001		-0.017
		[-2.04]		[-0.82]		[-0.042]		[-1.03]
Sales-shift 1 digit		0.028		-0.029		-0.013		-0.022
		[0.36]		[-0.33]		[-0.87]		[-1.17]
Sales-shift 2 digits		0		-0.026		0.001		-0.02
		[-0.0070]		[-0.48]		[0.056]		[-1.32]
Sales-shift 3 digits		-0.004		-0.084		-0.022		-0.014
		[-0.097]		[-1.81]		[-2.09]		[-1.15]
Sales-shift 4 digits		-0.03		-0.083		-0.042		-0.030
		[-0.81]		[-2.11]		[-4.33]		[-2.62]
High disc. dummy	0.069	0.069	0.007	0.007	0.007	0.006	0.018	0.021
	[3.69]	[3.64]	[0.33]	[0.32]	[1.63]	[1.47]	[3.57]	[4.04]
Div. dummy	-0.005	0.004	-0.004	-0.005	0.001	0.001	0.008	0.008
	[-0.44]	[0.38]	[-0.31]	[-0.39]	[0.47]	[0.47]	[2.33]	[2.22]
Log assets	0.777	0.822	0.684	0.684				
	[13.4]	[14.3]	[13.3]	[13.3]				
Ebit-to-sales	0.156	0.187	0.130	0.130	-0.057	-0.057	-0.046	-0.046
	[9.55]	[11.3]	[8.39]	[8.39]	[-12.2]	[-12.2]	[-9.87]	[-9.88]
Capex-to-sales	-0.338	-0.266	-0.213	-0.213	-0.071	-0.071	-0.057	-0.057
	[-16.7]	[-13.1]	[-10.7]	[-10.7]	[-10.9]	[-10.8]	[-8.30]	[-8.30]
Debt-to-assets		-0.105	-0.109	-0.109	0.016	0.017	0.018	0.018
		[-17.8]	[-19.4]	[-19.4]	[8.70]	[8.72]	[9.30]	[9.31]
Observations	64,220	64,220	64,220	64,220	64,220	64,220	64,220	64,220
Number of gvkey	9,257	9,257	9,257	9,257	9,257	9,257	9,257	9,257
R-squared	0.15	0.17	0.12	0.12	0.04	0.04	0.03	0.03

Robust t statistics in brackets

Table 1.11: Using alternative regression methods: OLS, Fama Mc Beth and Median Regression

This table presents the robustness tests results of using an alternative regression methods. The dependent variables for OLS and Fama Mc Beth Regressions are as previously defined. For the Median regression, Tobin's q is used instead of Log q. Independent variables are as defined in Table 1. OLS and Median regressions include year dummies. Industry dummies are defined using 2 digit SIC code. T-statistics are reported in parenthesis. Standard errors are corrected for heteroskedasticity and clustered by firm. N is the number of non missing observations. The R-squared for Median regression is a Pseudo-R square.

	OLS				Fama McBeth				Median Regs			
Dep. variable	Log q	Exc value	ROA	Exc ROA	Log q	Exc value	ROA	Exc ROA	Log q	Exc value	ROA	Exc ROA
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
H disc*Sales shift	-0.295	-0.097	0.013	-0.025	-0.272	-0.087	0.016	-0.021	-0.347	-0.135	-0.001	-0.017
	[-7.35]	[-2.56]	[1.36]	[-2.33]	[-8.22]	[-4.89]	[2.70]	[-3.73]	[-10.7]	[-5.91]	[-0.22]	[-3.48]
High disc. dummy	0.117	-0.008	-0.003	0.012	0.104	-0.014	-0.004	0.013	0.140	0.005	-0.002	0.005
	[6.59]	[-0.45]	[-0.77]	[2.75]	[7.38]	[-1.66]	[-1.39]	[6.73]	[9.88]	[0.53]	[-0.87]	[2.60]
Sales-shift	0.009	-0.045	-0.035	-0.028	0.012	-0.036	-0.032	-0.030	0.008	-0.051	-0.021	-0.013
	[0.26]	[-1.38]	[-4.16]	[-3.11]	[0.86]	[-3.04]	[-7.32]	[-5.86]	[0.25]	[-2.37]	[-4.43]	[-2.77]
Div. dummy	-0.048	-0.041	-0.004	0.000	-0.051	-0.041	-0.005	0.001	-0.034	-0.035	-0.004	0.001
	[-3.79]	[-3.20]	[-1.24]	[0.076]	[-7.27]	[-6.69]	[-3.14]	[0.53]	[-3.16]	[-4.59]	[-2.21]	[0.86]
Log assets	-0.006	0.002	0.013	0.011	-0.005	0.001	0.012	0.010	-0.005	0.007	0.006	0.004
	[-2.20]	[0.92]	[18.4]	[14.4]	[-2.21]	[0.91]	[9.45]	[8.84]	[-2.88]	[5.26]	[20.8]	[15.2]
Ebit-to-sales	1.233	1.122			1.324	1.230			2.691	2.284		
	[18.8]	[18.7]			[14.1]	[15.3]			[120]	[145]		
Capex-to-sales	0.239	0.173	-0.017	-0.011	0.236	0.181	-0.011	0.001	0.281	0.178	-0.014	-0.009
	[10.8]	[9.01]	[-3.00]	[-1.97]	[10.7]	[9.12]	[-1.51]	[0.061]	[14.8]	[13.4]	[-4.88]	[-3.14]
Debt-to-assets	-0.453	-0.325	-0.081	-0.081	-0.420	-0.315	-0.087	-0.088	-0.500	-0.321	-0.082	-0.072
	[-19.4]	[-15.0]	[-13.5]	[-13.2]	[-16.1]	[-18.2]	[-13.0]	[-16.4]	[-29.6]	[-27.0]	[-31.5]	[-29.0]
Year dummies	yes	yes	yes	yes	no	no	no	no	yes	yes	yes	yes
Ind. dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Observations	41,539	41,539	41,539	41,539	41,539	41,539	41,539	41,539	41,539	41,539	41,539	41,539
R-squared	0.31	0.16	0.06	0.07	0.31	0.19	0.09	0.09	0.15	0.07	0.05	0.04

Robust t statistics in brackets

Table 1.12: Using an alternative measure of non-core diversification

This table presents the robustness tests results of using an alternative way of measuring non-core diversification and the unrelatedness between business segments and the core-business. Dependent variables are as previously defined in table 3. Fan-Lan measure is computed as follows: $FL = \sum_j (w_j \times \frac{1}{C_{ij}})$ where w_j is the proportion of the j^{th} secondary segment sales in the total sales of the firm and C_{ij} is the complementary coefficient associated with the pair of industries to which the primary segment i and the secondary segment j belong. The complementary coefficient is defined as $C_{ij} = \frac{1}{2}[corr(b_{ik}, b_{jk}) + corr(v_{ki}, v_{kj})]$ where b_{ik} is the percentage of the output of industry i supplied to each intermediate industry k and v_{ki} the dollor value of industry k's output required to produce 1 dollar's worth of industry i's total output. Fan-Lang*Hdisc dummy is the interaction between Fan-Lang measure of diversification described and the high managerial discretion dummy. All other independent variables are as defined in Table 1. All the regressions include year dummies. T-statistics are reported in parenthesis. Standard errors are corrected for heteroskedasticity. N is the number of non missing observations.

Dep. variable	Log q	Log q	Exc value	Exc value	ROA	ROA	Exc ROA	Exc ROA
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Fan-LangH disc dummy	-0.102	-0.103	-0.06	-0.061	-0.012	-0.012	-0.012	-0.013
	[-1.72]	[-1.74]	[-0.99]	[-1.01]	[-0.70]	[-0.70]	[-0.70]	[-0.71]
Fan-Lang measure	-0.015	-0.015	-0.033	-0.033	0.012	0.012	0.008	0.008
	[-0.46]	[-0.45]	[-0.95]	[-0.93]	[1.14]	[1.14]	[0.74]	[0.74]
High disc. dummy	0.021	0.021	-0.019	-0.018	0.004	0.004	0.005	0.005
	[1.26]	[1.26]	[-1.02]	[-1.01]	[0.97]	[0.97]	[1.04]	[1.05]
Div. dummy	-0.022		-0.029		-0.002		-0.003	
	[-1.70]		[-2.14]		[-0.63]		[-0.77]	
Log assets	-0.111	-0.113	-0.111	-0.112	0.011	0.011	0.014	0.014
	[-11.9]	[-12.1]	[-12.2]	[-12.4]	[3.69]	[3.66]	[4.48]	[4.45]
Ebit-to-sales	1.048	1.049	0.875	0.875				
	[16.9]	[16.9]	[15.5]	[15.5]				
Capex-to-sales	0.119	0.119	0.059	0.059	-0.029	-0.029	-0.032	-0.032
	[5.56]	[5.57]	[3.03]	[3.04]	[-5.54]	[-5.54]	[-6.03]	[-6.03]
Debt-to-assets	-0.215	-0.216	-0.159	-0.160	-0.069	-0.069	-0.056	-0.056
	[-7.64]	[-7.65]	[-5.78]	[-5.79]	[-7.57]	[-7.58]	[-6.11]	[-6.11]
N	26,509	26,509	26,509	26,509	26,509	26,509	26,509	26,509
Number of firms	5,113	5,113	5,113	5,113	5,113	5,113	5,113	5,113
R-squared	0.19	0.19	0.13	0.13	0.03	0.03	0.03	0.03

Robust t statistics in brackets

Table 1.13: Adjusting q for godwill

This table presents the robustness tests results of using dependent variables adjusted for goodwill. Log q adjusted is the log of the ratio between market value of assets and adjusted book value of assets. Adjusted book value of assets is assets minus goodwill. Excess-value – adjusted corresponds to the excess-value measure where q is adjusted for goodwill. Assets - adjusted is the book vaue of assets minus goodwill. All other independent variables are as defined in Table 1. All the regressions include year dummies. T-statistics are reported in parenthesis. Standard errors are corrected for heteroskedasticity. N is the number of non missing observations.

Dep. variable	Log q Adj.	Ex value Adj.	Log q Adj.	Ex value Adj.	Log q Adj.	Ex value Adj.	Log q Adj.	Ex value Adj.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Sales-shift	-0.133	-0.237			-0.004	-0.176		
	[-1.69]	[-2.87]			[-0.044]	[-1.91]		
H disc.*Sales shift					-0.314	-0.136		
					[-2.82]	[-1.24]		
H discretion					0.167	0.021	0.167	0.0193
					[4.68]	[0.61]	[4.65]	[0.56]
Sales-shift 1			-0.193	-0.226			0.145	0.105
			[-1.06]	[-1.22]			[0.44]	[0.31]
Sales-shift 2			-0.055	-0.264			0.100	-0.127
			[-0.43]	[-1.58]			[0.56]	[-0.43]
Sales-shift 3			-0.231	-0.300			-0.00775	-0.218
			[-2.04]	[-2.75]			[-0.068]	[-1.92]
Sales-shift 4			-0.075	-0.193			-0.0263	-0.190
			[-0.89]	[-2.10]			[-0.29]	[-1.88]
H disc*Sales shift 1							-0.729	-0.596
							[-2.03]	[-1.63]
H disc*Sales shift 2							-0.368	-0.280
							[-1.45]	[-0.88]
H disc*Sales shift 3							-0.409	-0.102
							[-2.34]	[-0.58]
H disc*Sales shift 4							-0.0725	0.0247
							[-0.45]	[0.15]
Div. Dummy	0.050	0.054	0.049	0.053	0.052	0.055	0.0483	0.0535
	[1.93]	[2.01]	[1.88]	[1.99]	[1.69]	[1.79]	[1.60]	[1.76]
Log assets - Adj	-0.098	-0.105	-0.098	-0.105	-0.100	-0.111	-0.101	-0.111
	[-10.3]	[-11.6]	[-10.3]	[-11.6]	[-9.67]	[-11.3]	[-9.72]	[-11.3]
Ebit-to-sales	1.019	0.870	1.018	0.870	1.017	0.885	1.016	0.884
	[12.2]	[11.6]	[12.2]	[11.6]	[11.0]	[10.6]	[11.0]	[10.6]
Capex-to-sales	0.163	0.091	0.163	0.092	0.155	0.085	0.154	0.0846
	[6.10]	[3.61]	[6.10]	[3.61]	[5.51]	[3.23]	[5.50]	[3.22]
Debt-to-assets	-0.239	-0.158	-0.240	-0.158	-0.248	-0.162	-0.247	-0.161
	[-7.97]	[-5.45]	[-7.98]	[-5.46]	[-7.51]	[-5.07]	[-7.49]	[-5.05]
N	28,686	28,682	28,686	28,682	24,189	24,187	24,189	24,187
Number of firms	6,364	6,364	6,364	6,364	5,427	5,427	5,427	5,427
R-squared	0.150	0.136	0.150	0.136	0.152	0.144	0.15	0.14

Robust t statistics in brackets

2 The Value of CEOs' Industry Expertise - Evidence from Mergers & Acquisitions

2.1 Introduction

There is mounting evidence that CEOs matter for corporate performance.[6] However, little is known about the relevance and value of their personal characteristics and skills. The exception is a number of recent papers that address the rise on the importance of general skills of CEOs.[7] By opposition, the literature on mergers and acquisitions (M&A) is vast, and the heterogeneity in announcement returns is well documented. In this paper we study the role of CEO characteristics in the context of M&A. More precisely, the paper examines whether industry experience of the acquiring firm's CEO can partly explain the cross-sectional variation in the returns to the shareholders, when these companies perform diversifying mergers and acquisitions.

We find that CEOs who have work experience in the industry of the target add value for their shareholders. The abnormal return to the bidders' shareholders is between 1.1% and 1.3% higher when the CEO has top management experience in the target industry. Analyzing potential mechanisms for this effect, we provide evidence that CEOs with industry experience in the target's industry are not better in creating higher synergies but in negotiating more favourable terms. We show that experience is particularly valuable in environments of high informational asymmetries (1.6% - 2.9%). The results suggest that certain skills or experience of CEOs are neither completely general nor firm-specific but rather specific to an industry.

The acquisition of a company is an important strategic decisions that involves great CEO input as the process is complex and non standard to most companies and CEOs. First, the company has to define an acquisition strategy by identifying, selecting and analyzing potential acquisitions candidates by estimating potentials for synergies and evaluating the strategic and organizational fit. Secondly, the company has to design a bidding strategy for the target. Thirdly, the acquiring company must integrate the new company into the current firm, i.e. it must integrate the asset employees, and structure of the new company.

Andrade, Mitchell, and Stafford (2001) find that shareholders of the target are, on average, the clear winners of a merger.[8] The evidence on value creation for shareholders of the acquiring company is not so clear cut: While some studies find that

[6] See for instance Adams, Almeida and Ferreira (2005), Bennedson, Perez-Gonzalez and Wolfenzon (2008) and Bertrand and Schoar (2003).

[7] Frydman (2005) documents that modern-day executives have work experience in different sectors and that firms hire increasingly from outside their industry. Lazear (2004,2005) and Murphy and Zabojnik (2007) report that the educational and professional background of CEOs has become more general and less specialized. They define general skills as generic management skills that can easily be transferred across firms (and industries).

[8] They report 16.0% abnormal return within three days around the merger confirming earlier summary papers (e.g. Jensen and Ruback (1983) or Jarrell, Brickley and Netter (1988)).

shareholders break even, most find slightly negative abnormal returns.[9] We study whether and how the industry experience of CEOs impacts the performance of diversifying mergers and acquisitions. When buying a company, CEOs with relevant industry experience might be better at selecting targets, in negotiating with the target's management or in integrating and running the two companies.

We construct a new and unique CEO-firm matched panel that allows us to track the full employment history of a sample of US firms' CEOs. In particular, we observe whether the CEO of the acquiring company has prior work experience in the target's industry. The final sample consists of 4,844 deals over 1990 - 2007. Conducting a short-run event study of acquisition announcements, we find that the stock market reacts more favourably to diversifying mergers when the acquirer's CEO has work experience in the target's industry. After controlling for firm and deal characteristics and time and industry fixed effects, we find 3-days abnormal announcement returns to the acquirer to be higher (1.3%) for CEOs with top management experience in the target's industry. Given an average abnormal return of (0.5%) for diversifying acquisitions and an average market value of about US$m 8,000, the effect is large in relative as well as in absolute dollar terms.

One key concern is that the target industry experience might be correlated with more generic managerial skills or other unobserved characteristics, for instance CEO talent. However, including manager fixed effects helps us to identify the causal effect of industry experience on acquisition performance. Indeed, the fixed effects control for unobserved but fixed heterogeneity across CEOs such as generic managerial skills or specific talent for performing acquisitions. This is only possible to implement because we are able to observe within-CEO variation, i.e. some CEOs acquire multiple firms, some in industries in which they have work experience, and others not. The effect of experience is higher (3.1%) and statistically significant when including CEO fixed effects. In order to identify CEO fixed effects, we run this fixed effects regression only for a subsample of CEOs who are doing both diversifying acquisitions with and without experience in the target industry. Another concern is the fact that our results are driven by skills that were acquired in other industries, but not necessarily related to the target industry, for instance general CEO skills. In the full sample, we can include a proxy for CEO experience across different industries, i.e. for experience in other industries, not necessarily in the target industry. Including this proxy to our full sample shows that our results are driven by specific experience to the target's industry. While the effect of other industry experience is literally zero, the effect of experience in the target industry is significant and slightly higher than in our baseline analysis (1.6%).

Next, we analyze the potential mechanisms through which industry experience operates. First, we test if experienced CEOs are better able to create more synergies

[9] Andrade, Mitchell, and Stafford report an average three-day abnormal return of -0.7% which is not statistically significant.

by analyzing combined abnormal returns for the subsample of publicly listed targets. We calculate the market-cap weighted average of the abnormal returns to acquirer and target as a proxy for the value that is created or destroyed by the deal. We do not find evidence that experienced CEOs create more value in terms of combined returns. The effects of experience on the combined abnormal returns is actually negative, though not statistically different from zero. The abnormal returns to the acquirer in public target deals, on the contrary, are positive and significant, confirming our previous results. Together, these findings suggest that experienced CEOs do better when bargaining with the target, i.e. they are able to secure a greater fraction of the surplus or they are overpaying less.

Furthermore, we analyze this effect across different types of targets. We first compare public and private companies. Private companies have to disclose less information, and information asymmetries are arguably higher between these companies and potential buyers. If experience is valuable we expect it to be relatively more valuable in environments of high informational asymmetries. Our findings support this hypothesis. Experienced CEOs are able to generate between 2.1% and 2.9% abnormal returns compared to non-experienced managers if the target is a private company.

Second, we explore the heterogeneous effects across targets' industries. Using different proxies for informational asymmetries (R&D expenditures and intangibles) we find that experience is particularly valuable in industries with high R&D expenditures or intangibles (1.7%-1.9%). This supports the view that the return to experience is higher when experience is expected to be more important.

Last, we look at high managerial discretion industries.[10] Experience should be more valuable in industries where firm performance is likely to be more dependent on CEO skills and decisions. We therefore, expect industry experience to be more valuable when the target is in an industry with high managerial discretion. Using different managerial discretion proxies, we find that abnormal returns are between 1.6% and 2.5% higher when the acquiring CEO is experienced and the target is from a high discretion industry. However, interpreting our previous results on the combined returns, our finding suggest that high managerial discretion industries might be mainly a proxy for industries of high informational asymmetries. This interpretation is in line with theoretical results of Prendergast (2002) who shows that it is optimal to delegate responsibilities in uncertain environments.

Most, if not all, studies on the effect of CEOs on corporate decisions suffer from endogeneity concerns. CEOs and companies are not matched randomly but CEOs are chosen by the board of directors. Indeed, the industry experience of CEOs might be a criterion for the appointment of a particular CEO. In the case of acquisitions, one concern is that a firm with acquisition opportunities in a given industry might hire a CEO with expertise in that industry. In that case, the observed abnormal return might

[10] In this paper managerial discretion is understood as how much influence executives have on organizational outcomes.

purely originated from the firm's opportunities, and the effect of the CEO's industry experience might be spurious. Hence, endogenous matching could potentially explain our results or at least bias the findings.[11] We provide several pieces of evidence that it is actually the CEO with experience in the target industry who generates the abnormal returns.

First, as already discussed, experienced CEOs strike better deals but do not create more value. As there are apparently additional no synergies generated by the acquiring company, this suggests that it is the CEO herself who is able to negotiate better terms due to her experience. By using a very broad industry classification (Fama-French 12 industries) to classify diversifying mergers, we try to minimize the effect of potential synergies. Moreover, we take advantage of variation of unobservable synergies in our sample. Our argument is based on the assumption that conglomerates have higher unobservable potentials than focused firms. If selection, i.e. synergies, is driving the results and the effect of experience of the CEO is only spurious, we would expect to see larger effects for conglomerates (likely to have higher synergies) than for focused firms. However, if it is actually the experience of the CEO that matters, the effect is expected to be higher for focused firms where synergies on firm level are assumed to be smaller. We find support for the latter hypothesis: the effect of experienced CEOs is stronger for focused firms supporting the view that the effect of experience of the CEO on acquisition performance is causal.

Second, experience seems to matter more where it is more valuable (high vs. low discretion, public vs. private target) which is in line with the CEO hypothesis but cannot easily supported by selection.

Third, under the selection hypothesis one would expect the transaction to occur shortly following the CEO appointment.[12] However, we do not find that the likelihood of doing an acquisitions with a CEO who has experience in the target industry is higher for more recently hired CEOs. We also find no evidence that recently hired CEOs outperform CEOs that have been in a company for longer.

Fourth, we exploit the fact that mergers occur in waves clustered by industry. We use merger waves as quasi-exogenous events triggering acquisitions. The underlying assumption is that the occurrence of a wave is unexpected by the company and therefore, the appointment of the CEO is assumed to be exogenous to the merger.[13] The

[11] The case of spurious correlation, however, needs strong and, as we argue, unrealistic assumptions about the behaviour of a firm. Suppose a company has unobserved growth opportunities towards a particular industry and it is planning to acquire a certain company from that industry. Moreover, it expects an industry experienced CEO to add value and therefore, it hires an industry expert from that particular industry. However, effectively industry experience of CEOs does not matter at all for acquisitions and the total observed effect is due to the unobserved growth opportunities of the company. In that case, our findings would reflect only a spurious correlation.

[12] There is evidence that timing of an acquisition is important: Shleifer and Vishny (2003) build a theory of market timing; Moreover, the investor sentiment might be important or the pre-emption of potential competitors.

[13] We exclude merger waves that are due to deregulation as they are likely to be expected by companies.

effect of industry experience is positive and higher for acquisitions within a merger wave compared to acquisitions outside a wave, providing further evidence that it is not selection that drives our results.

The contributions of this paper are twofold. First, we contribute to research on mergers and acquisitions. There is a large number of studies relating abnormal returns of bidder and target to firm and deal characteristics. However, except for Malmendier and Tate (2008) and Yim (2009), little research has been done on whether the management of acquiring firms affects the performance of M&As. Malmendier and Tate document that overconfident CEOs undergo more acquisitions and that they perform worse on average. Yim shows that young CEOs are more likely to announce acquisitions and perform worse. This might be due to lower quality of the acquisitions, also reflected in a lower likelihood of closing the deals. We contribute to this area by showing that industry experience of CEOs matters for the performance of acquisitions. Our results might also provide a different explanation for Yim's findings as on average young CEOs are less experienced than older ones. Moreover, we analyze the mechanism that allows experienced managers to perform better. We provide evidence that experienced CEOs are not better in creating more synergies but in negotiating better terms when bargaining with the target. We show that experience is more valuable when it is likely to matter more, i.e. when informational asymmetries are high and a valuation of the target is more difficult. More general, our findings suggest that evaluation and price finding stage is very important for the performance of acquisitions and that CEOs are important determinants for their success.

Second, the paper adds to the literature whether, and how much CEOs matter for corporate performance (e.g. Bertrand and Schoar (2003), Adams, Almeida, and Ferreira (2005), Bennedsen, Perez-Gonzalez, and Wolfenzon (2007), Malmendier and Tate (2008), and Graham Li and Qui (2009)). However, with the exception of Bertrand and Schoar who look at MBA graduates and Malmendier and Tate who analyze decisions of overconfident CEOs, none of these studies tries to specify what characteristics of CEOs matter and how those affect corporate decisions.

Xuan (2009) also analyzes CEOs' work experience. He shows how the career paths of CEOs inside a company matter for internal capital allocation across divisions. We complement these papers by showing that CEOs' work experience is beneficial for some corporate decisions. This reinforces the view that the CEO dimension greatly matters for corporate performance. Moreover, we identify the effect of one particular characteristic, namely industry experience.

We also contribute to the current debate on whether CEO jobs place an increasing emphasis on general rather than specialized skills. Analyzing the largest publicly traded firms in the USA over the last century, Frydman (2007) and Lazear (2004, 2005) documents an increase of MBA graduates and higher occupational mobility of executives which Frydman interprets as evidence for the rise in the importance of general management skills. Murphy and Zabojnik (2007) also show that the fraction

of MBA graduates among CEOs has increased during the last decades. While our finding are not directly contradicting their results, they suggest a more complex view on the structure of managerial skills. In particular, CEOs gain experience during their career that is specific to a certain sector and not transferable across industries. This has important implications for the understanding of executive compensation or the hiring process of CEOs for instance.

Our paper is also related to Cremers and Grinstein (2009). Analyzing CEO replacements, they document that managerial talent pools are quite industry-specific and often even firm-specific, and that they impact compensation structure. Our paper is different in at least two dimensions. First, while Cremers and Grinstein look only at the last position of a new CEO, we consider the full employment history of CEOs. This is crucial as it accounts for the fact that executives have worked in different companies and industries prior their appointment. For instance, CEOs in our sample have worked for 2.6 different companies, in more than 1.6 different industries in a top-management position on average.[14] Secondly, while Cremers and Grinstein provide only indirect evidence that industry-specific human capital of CEOs matters by looking at revealed appointment decisions, we show directly how industry experience affects firm performance.

The paper proceeds as follows. Section 2 describes the dataset and presents descriptive statistics. Section 3 shows the baseline results of our regression analysis. In section 4 we analyze heterogeneous effects and investigate potential mechanisms. Alternative specifications and robustness checks are analyzed in section 5. Section 6 concludes.

2.2 Data

2.2.1 CEO-firm matched panel

We construct a manager-firm matched panel that allows us to observe a CEO's full employment history. Our initial sample is the COMPUSTAT ExecuComp file. The Executive Compensation database contains over 2,500 companies. The universe of firms covers the S&P 1,500, including companies that were once part of the 1,500 and companies removed from the index that are still trading from 1992 onwards. For each firm-year, ExecuComp reports the identity of up to 9 executives and their positions, allowing us to identify the current CEO. As ExecuComp keeps track of only S&P 1,500 companies, we supplement the data with information from the BoardEx database. This database collects information on job-history (including company roles and positions), date of birth, and other activities of top executives and non-executives in the US and Europe which allows us to track the work experience of CEOs.

[14] Considering all positions, CEOs worked for more than 6 companies in more than 3 different industries.

We merge the two datasets by CEO name, company, position/role and year, and construct a CEO-firm-year panel. Due to different spellings and abbreviations we manually validate the entire panel. To construct measures of experience we are interested in characteristics of previous positions of the CEOs. These characteristics include the firm's industry, the CEO role, and the exact period of each position. To identify the firms' industries, we match the list of CEOs' past companies with different data sources with information on their lines of business. We obtain information on quoted firms from COMPUSTAT and information on private firms from ICARUS.[15]

2.2.2 Mergers panel

The M&A data comes from the Thomson Financial SDC Platinum database. The initial sample contains all completed mergers and acquisitions in the US stock market over 1990 - 2008. To be included in our final sample, a deal has to meet the following criteria:

- **Shares Acquired.** We only include transactions in which the control is transferred, i.e. a) the share of the acquiror in the target firm has to be below 50\% before and above 50\% after the transaction (Item PHDA and A_POSTMERGE-_OWN_PCT). b) alternatively, the acquirer has to buy 50% of the shares outstanding during the merger process (Item PC TOWN).

- **Absolute Transactions Size.** Following Harford (2005) the transaction value of the merger has to be at least US$50M (Item VAL).

- **Region.** The acquiror and the target firm are both US corporations and the acquiror is listed on the US stock exchanges. We exclude international (Item MATYPE IMA) and overseas mergers (Item MATYPE OMA).

- **Price And Accounting Data.** The stock price and accounting data must be available in CRSP (Center for research in security prices) and in COMPUSTAT in the year before the merger.

We supplement the data with financial items from the COMPUSTAT database.[16] We classify a merger to be diversifying (dummy 0-1) if acquiror and target differ in their Fama-French 12-Industries (FF12) classification. Using this broad classification ensures that industries of diversifying mergers are unrelated.

[15] Sometimes company names are spelled differently in the datasets or the company in the BoardEx database refers to a subsidiary or a financial shell of the company. A simple example is 'Microsoft Corp' and 'Microsoft Inc'. Therefore, we 1) use a string-search matching algorithm, and 2) manually verify every single match. Companies that we could not match by this routine are manually researched using COMPUSTAT, ICARUS, and online data resources (mainly www.manta.com and www.alacra.com).

[16] See data appendix for the definition of all variables.

Following Masulis, Wang, and Xie (2007), a transaction is defined to be a "stock deal" (dummy 0-1) if the acquiror pays a positive fraction of the transaction value with its stocks; if the transaction is 100% paid with cash we set the "all cash" dummy equal to 1. Public target, private target and subsidiary target are dummies that classify the public status of the target company. In order to include an intercept we choose subsidiary targets as our base category in the regression analysis. We measure the relative size of acquiror and target as the ratio of the deal value to the market capitalization of the acquiror.[17]

Finally, we measure the age (in years) of the CEO at the announcement of the merger and her tenure in the current company (in years).

The key explaining variable in our study is industry-specific experience. We are interested in the impact of CEOs' industry-specific experience on the performance of diversifying mergers and acquisitions. We define a measure of industry experience as follows: for a given deal and a given target's industry we consider a manager as having experience in the target's industry if he worked in the same Fama-French-12 industry before joining the acquiring firm. This measure includes all roles and positions. We set a dummy variable equal to 1 if the CEO has worked in at least one company in that industry. We refine this measure by defining a measure of top level experience that is equal to 1 if the CEO has worked in at least one company in the target's industry as a top manager. Top manager positions/roles include CEO, CFO, COO, Chairman, President, Division CEO, Division CFO, Division Chairman, Division COO, Division President, Head of Division, Regional CEO, Regional CFO, Regional President. We expect top experience to matter more, as non-top level experience might also include positions that are unrelated with a firm's business line (e.g. being a web programmer in the automotive industry) or positions that do not allow to obtain industry specific skills and/or knowledge.

We use the Fama-French 3-factor model as the return-generating process to estimate cumulative abnormal returns *CAR*. We estimate the model over a 255 day estimation window ending 21 days prior to the announcement date, using the CRSP value-weighted index as our market proxy. In most specifications we report the CARs to the acquiring firm's stock over a symmetric three-day window around the announcements. We also analyze a longer event windows (eleven-days) considering potential information leakage.

2.2.3 Descriptive Statistics

After combining the CEO-company panel with the deal sample we obtain a final data sample of 4,844 mergers between 1990 and 2007. The mergers and acquisitions are conducted by 1,854 different CEOs. As we see in table 2.1 the average number of

[17] A large fraction of the targets is private and data on market value are not available.

deals per CEO is 2.61, with a median of 2. This means that we observe most CEOs doing multiple acquisitions. The key variables in our analysis are different measures of experience. An average CEO has worked in 6.60 companies. Including only top level experience an average CEO had 2.61 different CEO had top positions in companies before joining the acquiring company. Analyzing the industry experience of CEOs, we find that on average a CEO worked in 3.15 different industries (using the Fama-French 12 classification) while he was in only 1.67 different industries at top level positions. On average a CEO is 62 years old (as of today) and male (more than 98%).

Table 2.2 shows some descriptive deal statistics. Panel A presents the allocation of deals across time and type (diversifying vs. non-diversifying). The fraction of non-diversifying and diversifying mergers remains quite stable over the years (about 75% non-diversifying and 25% diversifying). Panel B presents summary statistics on the deal specific characteristics. In most cases the relative size of the target is smaller than 9% of the acquiror's size measured as market capitalization (about 24% on average). The types of the targets are public, private, and subsidiaries with about equal proportion. About 40% of the bids are considered to be stock deals, i.e. payments where some equity was used to pay of the target. About one third (30%) of the deals were exclusively paid in cash. Panel C identifies the fraction of diversifying mergers where the CEO had experience in the target's industry. About 35% of the CEOs worked in the industry of the target before joining the acquiring company. Only considering top level positions the fraction of experienced CEOs reduces to 16.5%.

Table 2.3 presents means and medians for corporate financial information. Panel A shows the corporate financial variables of the acquiror. The last two columns present equivalent summary statistics for the whole COMPUSTAT universe between 1990 and 2005 for comparison. As our initial sample (ExecuComp) covers only the biggest 1,500 US firms, the acquiring firms in our sample are indeed much larger in terms of book value of assets and market capitalization (12,560 and 7,147 on average) than the average COMPUSTAT company (1,303 and 1,376).[18] Cash and debt ratios are similar for acquiring firms and the full COMPUSTAT sample. On average, the acquiror's cash flow profitability is almost 50% higher than the average COMPUSTAT cash flow profitability (0.35 compared to 0.26). The bidder has a higher Tobin's q (2.48 compared to 2.11) than the COMPUSTAT average and therefore more valuable growth opportunities. Panel B presents the merger activity of the firms in our sample in the period between 1990 and 2007. More than half of the firms bought 2 or more companies (with an average of 3.37 deals per company).

Table 2.4 compares key variables across different subsamples. In columns (2)-(6) the sample is split between non-diversifying and diversifying acquisitions, while columns (7)-(11) present diversifying acquisitions with and without top-level experience of the CEO in the target's industry. The averages of most variables are statistically different for diversifying and non-diversifying transactions. Exceptions are

[18] Both measures are in Mio. US$

leverage, free cash flow, relative deal size and tenure of the CEO. Analyzing diversifying acquisitions with and without top-level experience shows that experienced CEOs perform better on average (0.012 vs 0.004) though the CARs are only weakly statistically different from each other (at 10% level). Most of the control variables are not statistically distinguishable for the two groups. Exceptions are the performance measure, stock payment, the relative deal size and the tenure of the CEO. bidders of CEOs that are experienced in the target's industry tend to have a lower profitability (0.291 vs. 0.359). They tend to use more stockpayment (36.9% vs. 29.2%) and the targets are relatively larger (33.1% vs. 19.0%). In addition, the CEOs' tenure on the current position is shorter (5.85 years vs. 14.84 years).

2.2.4 Empirical Methodology and Variable Construction

We propose to estimate the following regression equation:

$$CAR_{ijm} = \alpha_1 + \alpha_2 ExpTA_i * div_m + \alpha_3 div_m + \alpha_4 X_m + \alpha_5 Y_j + \alpha_6 Z_i + \varepsilon_{ijm}, \quad (2.1)$$

CAR_{ijm} stands for the cumulative abnormal returns of merger m conducted by CEO i while working for company j. The dummy div is equal to 1 if the transaction is diversifying and $ExpTA$ is the measure of experience in the target's industry defined above. Note that by definition, $ExpTa$ is only defined for diversifying mergers. Therefore, we only include $ExpTa$ for diversifying mergers in our regression equation, i.e. we interact it with the dummy for diversifying acquisitions. The variables X,Y,Z are deal, company, and CEO related controls respectively, that have been used in cross sectional merger analyses. The set of controls X includes the relative size of acquiror and target, the method of payment, and the type of the target. Firm specific characteristics Y control for the size of the acquiror, Tobin's Q, free cash flow, leverage, and profitability. As experience will be correlated with age, we also control, as suggested by the empirical literature on wages, for age and age squared as well as for tenure and tenure squared in the set of variables Z. Harford (2005) shows that mergers occur in waves and are clustered within industries. Therefore, we include year, industry and year-industry dummies in all of our specifications. Finally, we account for cross-sectional correlation of stock returns by allowing for clustering at the level of the announcement date.

The coefficient of interest is the interaction term between diversifying mergers and experience. If industry-specific skills in the target's industry are beneficial for diversifying mergers, we expect the coefficient to be positive.

2.3 Do experienced CEOs perform better?

2.3.1 Baseline results

Column (1) of table 2.5 estimates the model including only year-industry dummies as controls. Having a CEO who has worked in the target's industry in a top management position leads to 1.1% higher abnormal returns on average compared to a CEO not experienced in the target's industry. The coefficient of the experience-diversifying interacted term is significant at a 10% level. The coefficient on diversifying is not distinguishable from zero. In specification (2) we repeat this exercise by including further controls. The effect of experience is slightly higher 1.3% and significant at a 5% level. The controls in the cross-sectional analysis have the expected signs but most of them are not significantly different from zero (confirming earlier studies). The three consistently significant controls are the type of payment, size, leverage and having a publicly listed target. Paying with equity and being big are, on average, viewed less favourably by the market. These results are consistent with previous empirical studies.[19]

2.3.2 Unobserved CEO characteristics

As the treatment, i.e. experience in a specific industry, is not randomly assigned, the concern is that selection biases our results. The observed performance difference between acquisitions of CEOs with and without experience can be decomposed into the "average treatment effect on the treated" plus the "selection bias". In our concrete case, industry-specific experience may be merely a proxy for more generic managerial skills or other unobserved characteristics that are driving our results. However, our setup allows us to observe within-CEO variation, i.e. some CEOs undergo multiple acquisitions, some with and some without industry experience. Therefore, we can include manager fixed effects controlling for fixed unobserved heterogeneity across CEOs like generic managerial skills, talent for performing acquisitions or structuring deals. Moreover, we also proxy for inter-industry experience in our analysis controlling directly for generic management skills.

In order to absorb unobserved CEO characteristics that might be correlated with experience we estimate a model where CEO-specific affects fe_i measure unobserved CEO heterogeneity:

$$CAR_{ijm} = \alpha_1 + \alpha_2 ExpTA_i * div_m + \alpha_3 div_m + \alpha_4 X_m + \alpha_5 Y_j + \alpha_6 Z_i + fe_i + \varepsilon_{ijm}, \quad (2.2)$$

[19] Shleifer and Vishny (2003) build a model where overvalued bidders lock in real assets which is empirically tested by Ang and Chen (2006). Moeller, Schlingemann and Stulz (2005) find that small companies outperform large ones in mergers.

Note that the CEO related variables in Z, namely age at the day of the announcement and tenure inside the current firm, are time-varying and therefore not dropped in this estimation. We restrict our sample to CEOs who conducted at least two diversifying acquisitions. Further we require that the CEOs are experienced in one of the acquisitions and he does not have experience on the other one. Applying these filters leads to a sample of 470 acquisitions conducted by 213 different CEOs. Table 2.6 presents the results of our regression analysis. The effect of having top-level experience is much higher (3.1%) and significant at a 5% level. The results provide further confidence in a causal interpretation of our findings as they support the view that the results are not driven by unobserved CEO characterstics like generic management skills or talent for performing acquisitions that are corellated with industry-specific experience.

2.3.3 General skills (industries)

We can not include CEO fixed effects to our analysis of the full sample, we can, however, control for general managerial experience. The positive effects of experience in the target's industry may merely be capturing the effect of having work experience in any different industry on general management experience. Being experienced in the target's industry in a diversifying merger necessarily means that the CEO has worked in at least two different industries (including the current one). It might be possible that managers who have worked in different industries are simply better at diversifying acquisitions. Skills needed for successfully diversifying might be more general, i.e. more related to general cross-industry skills and not necessarily directly related to the industry of the target. In order to discriminate between the benefits of experience related to the target's industry and general experience in different industries, we estimate two alternative models: First, we analyze whether *experience in any other industry* has a similar positive impact on abnormal returns for acquiring shareholders. In a second step we include *experience in any other industry* in our original regression as further control and check whether the expected effects of the *experience in target's industry* variable are still present. Table 2.7 presents the results. Column (1) shows the sole effect of having top-level experience in any other industries (not necessarily in the target's industry) when performing a diversifying merger. The effect is small in absolute terms and it is statistically not distinguishable from zero. This means that work experience in different industries that are unrelated to the target industry cannot explain superior abnormal returns. In specification (2) we add the variable top experience in the target's industry as further controls. The effect of having experience in the target's industry on the acquisition performance is still large and consistent with the previous results. The average abnormal return of a CEO having experience in the target's industry compared to a CEO who is generally experienced in different

industries is 1.6%. The effect is significant at a 5% level. Overall, these results suggest that it is experience in the particular industry of the target that matters for the performance and not more general cross-industry experience.

2.3.4 General skills (companies)

An experienced manager is defined as a manager who has worked in the target's industry in the past. This implies that all experienced managers have work experience in at least two different companies. Therefore, one could argue that it is not industry-specific experience that is driving abnormal returns but more general managerial experience. To address this issue we run additional tests. First, we define an experienced manager as someone who has worked in a different company in the past (irrespective of the industry), considering all kinds of positions. Then, we run the models with our main variable of interest: experience in the target's industry controlling for experience in any other company as well. Table 2.7 shows these results. Column (3) presents the results of the model using experience in any other company, irrespective of the industry. We find no evidence that working for other companies in the past helps to generate abnormal returns for the acquirer. Column (4) shows the results for top experience in the target's industry as a control. Similarly to our main specification, industry experience increases cumulative abnormal returns around the merger announcement by approximately 1.3%. The coefficients are precisely estimated (at a 5% level) and are similar to the effects of controlling for general industry experience.

2.4 Heterogenous Effects - Potential Channels

By exploring heterogeneous effects in our results, we aim, on hand hand, to shed some light on the channels that allow experienced CEOs to perform better in diversifying mergers and, on the other hand, to strengthen our confidence that it is not selection that is driving the results.[20]

Experience might matter at different stages of an acquisition process: When selecting targets, implementing the deal or integrating and running the companies. We also expect the return to experience to depend on the relative importance of experience. In the following sections, we show that experience is particularly valuable in environments of high informational asymmetry or of high managerial discretion. Moreover, we provide evidence that experienced CEOs do not create a higher surplus. We then discuss our findings relating to theory. We interpret these results as weak evidence in favor of the hypothesis that experienced CEOs are able to negotiate better terms when bargaining with the target due to lower informational asymmetries.

[20] See section 2.5 for a detailed discussion on selection.

2.4.1 Public Status

One source for information asymmetries is the public status of the target. We differentiate between three different types of targets: publicly listed companies, private companies, and subsidiaries. Private companies have to disclose less information, and information asymmetries are arguably higher between these companies and potential buyers. If industry-specific experience is valuable, we expect experience to be relatively more important in environments of high informational asymmetries. This is supported by our findings in table 2.8. Column (1) shows that experienced CEOs are able to generate 2.9% abnormal returns compared to non-experienced managers if the target is a private company. The effects of experience are positve but smaller and statistically not different from zero for public and subsidiary targets, suggesting that the advantage of experience is smaller (or even not existent) when information is easily accessable and available.

2.4.2 Managerial Discretion

Next, we are interested in whether we find heterogeneous results among industries. Having experience in the target's industry should matter more in industries where managerial discretion is high. Following Adams, Almeida and Ferreira (2005), we use an industry index of managerial discretion developed by Hambrick and Abrahamson (1995) aimed to measure how much influence executives have on organizational outcomes.[21] For instance, according to the index, computers are considered to be an industry of high managerial discretion while natural gas distribution is classified as a low managerial discretion industry. The index classifies the 17 industries at the 4-digit SIC code level. However, in order to minimize missing values for firms which SIC codes are not covered by this rating, we average the discretion score at Fama-French-12 level, in the same way as in Adams et al. (2005). Then we classify the industry of the target according to this index when available. We obtain a discretion score for about 70% of our observations. We then split the sample along the median value of the discretion index in our sample. Column (2) of table 2.8 presents results for the high-discretion industry and low-discretion industry group. For high-discretion targets the coefficient of managerial industry experience on the performance is 2.0%. The effect of having experience in the target's industry is not distinguishable from zero if the target is from a low-discretion industry. The results suggest that CEOs

[21] This index relies on the theoretical formulation of Hambrick and Finkelstein (1987) who specify seven industry-level factors that determine managerial discretion: product differentiability, market growth, industry structure, demand instability, quasi-legal constraints, powerful outside forces and capital intensity. Hambrick and Abrahamson (1995) index corresponds to a panel rating of managerial discretion by academics for 17 industries. Then, they examine the association between this rating and the determinants of discretion proposed by Hambrick and Finkelstein (1987) and conclude for the validity of the index.

are important in industries where experience is more valuable. On the other hand, if CEO skills are not a significant determinant of firm performance, then the lack of industry-specifc skills do not hurt the performance of the acquisition.

As an alternative measure for managerial discretion we use the distribution of managers' fixed effects of a firm performance regression as explained in detail in Metzger (2009): Employing the full BoardEx sample of CEOs of COMPUSTAT companies between 1980 and 2007 we construct a firm-CEO-year panel. We then run a similar regression as Bertrand and Schoar (2003), namely regressing return on assets on company size and year dummies, including firm and CEO fixed effects. We can only identify the fixed effects for managers who we observe in at least two different companies; we keep the fixed effects and their standard errors. We then restrict our sample to fixed effects of managers who only worked in one industry as a CEO and calculate the standard deviation of the fixed effects per Fama-French-12 industry.[22] As a robustness check we weight the standard deviation by the standard errors of the individual fixed effects giving less weight to less precisely estimated fixed effects. The standard deviation of the CEO fixed effects tells us how different the impact of different CEOs on performance is in a particular industry. We split the industries along the median value of the standard deviations of managers' fixed effects in high and low discretion industries. Column (3) of table 2.8 reports the results of the regression analysis which largely confirm the results of the previous discretion measure of Hambrick and Abrahamson. The effect of experience is large and positive for high discretion targets. Experienced CEOs are able to generate 1.6% abnormal returns. When the target is coming from a low discretion industry the coefficients are very small and not distinguishable from zero.

2.4.3 R&D intensive industries and intangibles

We also employ additional proxies for information asymmetries between the target and potential buyers. In columns (4) and (5) of table 2.8 we split the industries of the target along high vs. low R&D and high vs. low intangibles industries. We calculate the average R&D expenditures and intangibles across industries over the full horizon (1990-2007) of our sample and split the industries along the median in high and low R&D intangible industries. Confirming the results from our previous analysis (public status of the target and the managerial discretion), experienced CEOs are able to generate large and postive CARs if the target is from an industry with arguable higher informational asymmetries. The effects are about 1.9% and 1.7% for high R&D and high intangibles industry targets; the effects are smaller and not distinguishable from zero for targets from industries with lower informational asymmetries.

[22] The restriction is necessary as otherwise we can not allocate the fixed effect to a particular industry if the CEO worked in more than one industry.

2.4.4 Combined Returns

About one third of the targets in our sample are publicly listed companies. This allows us to analyze the effect of experience on both the acquirers' as well as the targets' returns. We collect prices and data on the market capitalization of the target from CRSP. We obtain the announcement return (CAR) on the combined companies by calculating the market-cap weighted average of the individual announcement returns of acquirer and target. The combined CAR can be interpreted as a measure for the surplus created by the acquisition. We then run similar regressions as before where we regress the CARs of the acquirer, of the target, and of the combined company on the experience of the CEO and further controls. Table 2.9 presents the results. As we are restricting our sample to public targets only, we first want to ensure that our sample is comparable to the full sample. Column (2) shows that the returns to the acquirer are very similar if the CEO has top-management experience (2.0%). The dummy whether an acquisitions is diversifying or not for the combined company in column (1) is large and negative (-2.2%). This supports the view that diversifying mergers and acquisitions are creating less surplus on average. Interestingly, we do not find evidence that experience CEOs are better in creating surplus. The effect of industry-experience on the combined return is actually negative. However, the coefficient is statistically not distinguishable from zero.

2.4.5 Discussion

When buying a company, relevant industry experience of a CEO may add value in different ways.

1. **Target's selection:** In the selection process of a potential target, an experienced CEO might have a superior overview on the market environment; for example competitors, customers, and suppliers. Moreover, industry-specific knowledge of the financial statements, being important inputs to the decision making process, might be important.

2. **Negotiation:** When bargaining with the target, experience might be also an important determinant of success. Having access to better information or being an industry expert might help when negotiating with the target. Given that an acquisition is an asymmetric information scenario, where one party has an informational advantage, the informed party's (the target) self-interest is served by deceiving the uninformed party (the acquiror) into believing that the available surplus is smaller than it really is. Moreover, the level of experience might affect the bargaining power of both parties.

3. **Integration:** Experience might be beneficial in the post-deal stage when integrating and running the two companies. This is particularly true if the organizational design and the operations are very specific to each of the industries. The knowledge of both industries might alleviate this complexity and facilitate the coordination of the two organizational designs. Moreover, experience in the target's industry might be beneficial for running the company in case management is partly industry specific.

Hypotheses 1 (selection) and 3 (integration) imply that experienced CEOs generate higher surplus. On the contrary, the implication of hypothesis 2 (bargaining) is that experienced CEOs are able to lock a bigger fraction of the surplus. In general, these effects are not mutually exclusive, i.e. it is possible that experienced CEOs increase the surplus and, at the same time, negotiate better terms. However, by analyzing the combined return to bidder and target, we do not find evidence that experienced CEOs are better in creating surplus as we do not find a positive effect of experience on the combined abnormal return. This is suggesting that the positive abnormal returns for the bidders are created during the bargaining process.

Our results relate to findings by Mantecon (2008) and Eckbo and Langohr (1989) who show that information asymmetries between the target and the market affect the return to bidders' and targets' shareholders. Mantecon argues that information asymmetries lead to less competition, i.e. to a reduced pool of potential buyers, and ultimately, weakens the bargaining power of the target. This is consistent with Bradley, Desai, and Han (1988) who show that competition among bidding firms increases the returns to targets and decreases the returns to bidders. Eckbo and Langohr (1989) claim that the success from acquisition activity depend on whether the bidder's initial information advantage can be maintained throughout the process, providing some evidence from changes to public disclosure rules in France, that might, by revealing information in the initial offer, stimulate competing bids.

Our results are consistent with these findings. We do not find evidence that experienced CEOs create more surplus, suggesting that the positive returns for the bidders are created when bargaining with the target. By analyzing heterogeneous effects, we find the effect of having experience to be higher for private targets or for targets from high managerial discretion industries supporting the view that informational asymmetries matter.[23] However, our interpretation heavily relies on the observation that experienced CEOs are not better in creating a higher surplus. A shortfall of our data is that we can only get a proxy for the surplus for one third of our observations (for the public targets) and it is not clear if the findings generalize to all deals. Moreover, our estimate for the effect of experience on the combined return is, though not positive, not very precisely estimated.

[23] Prendergast (2002) shows that uncertain environments optimally lead to more delegation.

2.5 Identification Concerns and Robustness Tests

2.5.1 Selection

While our results are consistent with the hypothesis that industry experience is beneficial while diversifying via acquisition, a key concern is that selection or endogeneity is driving our results.

Selection emerges from the fact that CEOs and companies are not matched randomly but CEOs are chosen by the board of directors. Industry experience of CEOs might be a selection criterion of the board for the appointment of a particular CEO. In the present case, one may be concerned about the following scenario: Given a company has (to us) unobserved opportunities towards a certain industry and therefore, intends to buy a company in that particular industry, the board might hire an industry expert for doing the acquisition. Hence, endogenous matching could potentially explain our results or, at least, bias the findings.

The case of a spurious correlation, however, needs strong and, as we argue, unrealistic assumptions about the behavior of a firm. Suppose a company has unobserved opportunities towards a particular industry and it is planning to acquire a certain company from that industry. In addition, it expects an industry experienced CEO to add value and therefore, hires an industry expert from that particular industry. However, effectively industry experience of CEOs do not matter at all for acquisitions and the total observed effect arises only from unobserved opportunities at the company level. In that case, our findings would reflect only a spurious correlation.

In what follows we provide several pieces of evidence suggesting that it is not selection that is driving our results and supporting the view that the positive impact of industry experience on acquisition performance is causal.

Merger Waves Previous research by Mitchell and Mulherin (1996) and Harford (2005) shows that mergers and acquisitions occur in waves and within a wave they strongly cluster by industry. These waves might be triggered by technological innovation or by supply shocks for instance. Assuming that these shocks and the need to acquire are less likely to be foreseen by the board of directors when appointing a new CEO, we build a subsample of mergers where the bidder comes from an industry that is hit by a merger wave at the date of the announcement. We define an acquisition being part of a merger wave if the announcement date of the merger is between 6 months before and 6 months after the date of a merger wave and the industry of the bidder corresponds to the affected industry (as identified by Harford (2005)). We further exclude waves that are due to deregulation as these waves are likely to be expected by the firms. By applying this definition we identify 677 mergers that are involved in a merger wave. Table 2.10 presents the results. Experience of the CEOs is positive and significant (at a 10% level) for top-level experience within and outside merger waves

supporting the view that it is not selection that is driving our results. Moreover, the effects are stronger within a wave (2.4% vs. 1.1%) suggesting that experience is more valuable in unexpected situations.

Timing of Experienced Acquisitions If a company is planning to buy a particular company in a certain industry and therefore, hires an experienced CEO to conduct the acquisition, we would expect to observe this announcement shortly after the appointment. We therefore estimate the probability of making a diversified acquisitions and having an experienced CEO as a function of the CEO tenure. The dependent variable is a dummy that is equal to one if the CEO has previous experience in the target's industry. Our covariates consist of a set of dummy variables for different years of tenure of the CEO. If companies appoint experienced CEOs in order to execute acquisition for them we would expect to observe higher coefficients on the dummies that stand for recent hires. We use OLS as well as probit estimation. Column (1) and (2) of table 2.11 present the results using OLS and Probit respectively. There is no monotonic relationship between the probability of observing an experienced acquisition and the appointment of the experienced CEO. These findings are supportive of the view that industry-experience in connection with acquisitions considerations play, if any, a rather minor role when appointing a CEO.

Timing and Returns As a further robustness check we analyze the returns directly. If selection is driving the results we would expect that the positive abnormal returns to be generated by recently appointed CEOs. We therefore interact the experience measure with dummies reflecting the relative year of the appointment. Table 2.12 shows that there is no monotonic relationship between the appointment of experienced CEOs and abnormal returns. When precisely estimated, the returns are positive and at similar levels (between 2.7% and 3.9% for CEOs appointed 3,6, or 8 years before the acquisition). The coefficients in the other years are not statistically different from zero. Overall, the findings suggest that selection can not explain the positive returns of experienced CEOs which reinforces the view that industry experience is actually generating them.

Additional Evidence from previous Analysis The results of the previous section 4 are further evidence for allowing a causal interpretion of the positive effect of industry-specific experience on announcement returns. When analyzing the combined abnormal returns for public targets, we do not find evidence that experienced CEOs are better in creating synergies. As the effect of experience on abnormal returns of the acquiring company is positive, our results suggest that experienced CEOs are better in negotiating terms that are favorable to the shareholders of the acquiring company.

Moreover, when analyzing heterogeneous effects across industries or public status of the target we provide further evidence that the observed effects are generated by the CEOs rather than by selection. Overall, our findings suggest that experience matters more where it is more valuable (high vs. low discretion, public vs. non-public target) which is in line with the CEO hypothesis but can not easily supported by selection.

2.5.2 Robustness Tests

All and Low-Ranked experience Managers might have better opportunities to accumulate industry specific skills and knowledge in higher level positions. A possible explanation is a better access to information and different (e.g. more strategic) tasks that are involved in high positions. In table 2.13 we analyze broader measures of experience. In specification (1) we consider all previous positions in the target industry irrespective of the level. As expected the effect is smaller (1.0%) though still significant. Moreover, we run a placebo test where we analyze the impact of experience that is likely to be unrelated with the industry in the firm. Examples are low-ranked jobs like office workers or interns as well as non-business positions (e.g. web programmer working for a car maker). Experience that is unrelated to the business or of a lower level of decision power or information access does not help to perform better when acquiring a new segment. The effect is 0.4% and not distinguishable from zero. However, we might also capture only a time effect as most of the low-ranked experience probably comes from the early stage of the career (see our alternative measure of experience that accounts for the recency of the experience). In this setting we are not able to differentiate these two effects.

Recency of experience As industries (e.g. due to technological changes or due to changes in the market) change over time it is interesting to analyze how the value of experience changes with the recency of the experience. Therefore, we look at two alternative measures of experience that incorporate a time component. First, we consider an experience to be "recent" if it was gained within the last 10 years before the announcement of the merger, and to be "old" if it is older than 10 years. Second, we refine this measure by sub-classifying the recent experience into experience gained within the last 5 years and experience gained between 6 and 10 years before the announcement of the acquisition. Table 2.14 reports the results. Column (1) and (2) show the effect of top-level experience for the two alternative measures. The results suggest that experience diminishes over time and only rather recently gained experience helps to perform better when diversifying. The first specification shows very strong and statistically effects of having experience (2.0%) that was gained within the last 10 years before. The coefficient of old experience is small and not distinguishable from zero. Analyzing the finer measure of recency in specification (2) shows similar

results. The recent experience matters more; the impact peaks for experience that was gained between 5 and 10 years ago. However, the two coefficients of the recent experience are not statistically distinguishable from each other.

Exclusion of conglomerates Some companies are multi-segment firms, i.e. operating in different industries. In our previous specifications we only consider the biggest segment of the acquiring firm when defining their industry. A concern might be that our results are purely driven by companies that have large secondary segments in the industry of the target, i.e. the mergers are not really diversifying and the positive effect of experience of the CEO is actually driven by potential synergies for instance. We therefore restrict our sample to firms that report either only one business segment (according to COMPUSTAT segments) or where the largest business segment is accountable for at least 90% of the sales. In column (1) of table 2.15 only single segment firms are considered. The effect of experience is still positive and even higher than compared to our baseline specification (3.7%). The results for companies with the largest segement accounting for at least 90% of the sales (column (2)) are similar, though a bit smaller (3.2%) and not distinguishable from zero when considering all levels of experience. Overall, the results seem to suggest that experience is more valueable when specialised firms diversify.

Diversifying only By looking at diversifying acquisitions only we allow the covariates to have different slope coefficients for diversifying and non-diversifying acquistions. The restriction leads to a sample of 1,189 acquistions. We then replicate our analysis by regressing abnormal returns on the industry experience of the CEO and firm and deal characteristics as well as year and industry fixed effects. The results in table 2.16 support our previous findings: CEOs who have experience in the industry of the target do better on average. Experienced CEOs are able to generate 1.0% abnormal return if they worked in the industry of the target. This effect is significant at a 5% level. The finding shows that the results also hold for the smaller sample. However, the bigger sample helps to estimate the other coefficients leading to more precise estimates.

Alternative Event Window In our previous specifications we use a 3 days event window to compute cumulative abnormal returns around the deal's announcement: from 1 day before the announcement until 1 day after. We test for the robustness of previous results using an alternative event window: from 5 days before the announcement until 5 days after. This approach allows us to account for possible information leakage regarding the acquisition before the public announcement. If this is the case,

part of the abnormal returns driven by the event would be realized before the announcement. The result is shown in table 2.17. The effect of top management experience, confirming our previous, is larger (1.3%) and significant. Overall, the result is consistent with our previous results though they are a bit weaker. However, by increasing the length of the event window we also increase the likelihood that unrelated events to the merger are affecting abnormal returns.

2.6 Conclusion

This paper examines the effect of industry-specific human capital of CEOs on the performance of diversifying mergers and acquisitions. We use a new and unique dataset that tracks the complete employment history of CEOs allowing us to construct a measure of industry-specific experience. Conducting a short-run event study of acquisition announcements, we find that the stock market reacts more favorable to diversifying mergers when the acquiring CEO has prior work experience in the target's industry. The results suggest industry-specific experience is an important determinant of success of diversifying acquisitions. The effect of industry-specific experience is particularly pronounced if the CEO has top management experience.

In addition, we quantify the relative importance of this experience and we find evidence that experience is more valuable if the target is from an industry of high managerial discretion or it is a private company. Exploring potential mechanisms, we find that experienced CEOs are more likely to add value by negotiating better terms for the existing shareholders and that the value is larger in environments of higher informational asymmetries.

Frydman (2005) and Murphy and Zabojnik (2007) posit that the drastic increase of executive compensation is due to a shift from firm-specific skills towards general managerial ability that has intensified the competition among companies for CEOs. Our results suggest a complexer view of CEO skills: Some skills of CEOs are neither completely general nor firm-specific but rather specific to an industry.

This paper does not explore the implications of the importance of industry-specific skills for the understanding of compensation or CEO hiring. Do companies pay for these skills? Are they an important determinant when hiring a new CEO for instance? Another natural extension to the paper is to examine the interplay between work experience and education. Does education matter? Are education and experience substitutes? These are questions for future research.

2.7 Tables

Table 2.1: Descriptive Statistics: CEOs

Panel A shows experience and characteristics of CEOs. Work experience (companies) counts the number of different companies the CEOs worked in. Experience is splitted up in "all experience" and TOP experience; while the first measure considers all kinds of positions / roles in a firm the latter one focuses on top positions (CEO, CFO, COO, Chairman, President, Division CEO, Division CFO, Division Chairman, Division COO, Division President, Head of Division, Regional CEO, Regional CFO, Regional President). Work experience (industries) conducts the same analysis for industries. Panel B presents age, gender, and education of the CEOs. Age is measured in Dec. 2008.

Panel A: Industry experience

	All experiences			TOP experience		
	mean	median	N	mean	median	N
Work experience (Companies)	6.60	6	1,854	2.61	2	1,854
Work experience (Industries)	3.15	3	1,854	1.67	1	1,854

Panel B: CEO characteritics

	mean	median	N
Age	61.89	62	1,854
Gender			
Female	1.39%		1,854
Male	98.61%		1,854
Merger experience	2.61	2	1,854

Table 2.2: Descriptive Statistics: Deals

Panel A displays the total number of mergers in the sample by time period; the total number represents the number of mergers with return data of the acquirer available. The first column shows all mergers and columns two and three splits the sample in mergers of companies that are operating in the same and in different industries respectively (non-diversifying and diversifying mergers). Panel B presents deal characteristics. The transaction value is the total value of consideration excluding fees and expenses. The public status of the target can take values {private, public, subsidiary}. The relative size is the ratio of deal value and the marketcap of the bidder, stock deal is a dummy equal to 1 if there are stocks in the consideration package and all-cash deal is equal to 1 if the whole acquisition is paid in cash. Percentage Cash/Stocks/Others denote the respective fraction on the consideration. Contested bid is a dummy equal to 1 if there is at least one company challenging the bidder. Panel C shows the experience in mergers of the CEO and her industry experience (all) in her diversifying mergers. Merger experience measures the number of mergers a CEO has made in this sample. Industry experience in diversifying mergers represents the fraction of diversifying mergers where the CEO worked in the target's industry before (allowing for all kind of experiences).

Panel A: Classification by time period and type of the deal

	All		Diversifying	
Years	No.		No.	
1990-1994	618	-12.80%	151	-24.40%
1995-1999	1,722	-35.50%	427	-24.80%
2000-2004	1,622	-33.50%	382	-23.50%
2005-2007	882	-18.20%	233	-26.40%
	4,844	-100%	1,193	-24.60%

Panel B: Deal-Statistics

	Mean	Median
Transaction value in Mio. US (TV)$	970.08	200
Relative size	23.75	8.83
TV/assets (market)	13.76%	4.75%
TV/equity	23.75%	8.82%
Private target	32.11%	
Public target	35.59%	
Subsidiary target	31.68%	
Stock deal	40.95%	
All-cash deal	30.07%	
Perc. Cash	39.31%	
Perc. Stocks	32.56%	
Perc. Other or Unknown	28.42%	

Panel C: Industry experience in diversifying mergers

	All experiences		TOP experience	
	mean	N	mean	N
Industry exp. in div. mergers	34.95%	1,193	16.51%	1,193

Table 2.3: Descriptive Statistics: Companies

Panel A shows data on corporate size, profitability and growth opportunities of the acquirer. The market value of equity (market capitalization in millions of US-$) is computed as common shares outstanding times the fiscal year closing price. Cash and debt are normalized by the bookvalue of total assets. Tobin's Q is the market value of total assets divided by the book value of total assets and book-to-market (BM) is defined as the ratio of book value of equity and marketcap. Profitability is measured as the ratio of operating cash flows divided by the market value of total assets. Panel B presents the experience in mergers by the companies. Merger experience denotes the number of acquired firms per company in this sample.

Panel A: Financial Data

	Aquirer		COMPUSTAT	
	Mean	Median	Mean	Median
Assets (book)	12,560.25	1,634.30	1,303.15	74.31
Market capitalization	7,146.63	1,816.75	1,376.95	64.87
Cashassets (book)	0.146	0.068	0.167	0.082
Debtassets (book)	0.189	0.161	0.176	0.112
Debtassets (market)	0.129	0.095	0.132	0.071
Tobin's q	2.48	1.68	2.106	1.41
BM (equity)	0.483	0.439	0.684	0.517
OCF/assets (book)	0.349	0.327	0.264	0.275

Panel B: Companies experience

	mean	median	N
Merger experience	3.37	2	1,438

Table 2.4: Descriptive statistics: Univariate Analysis

This table compares key variables across different sub-groups of the acquisitions. Columns 2-4 contrast non-diversifying and diversifying acquistions; columns 5-7 contrast diversifying acquisitions where the CEO does not have experience in the target's industry with diversifying acquistions of experienced CEOs. The market value of equity (market capitalization in millions of US-\$) is computed as common shares outstanding times the fiscal year closing price. Cash and debt are normalized by the bookvalue of total assets. Tobin's Q is the market value of total assets divided by the book value of total assets and book-to-market (BM) is defined as the ratio of book value of equity and marketcap. Profitability is measured as the ratio of operating cash flows divided by the market value of total assets. The transaction value is the total value of consideration excluding fees and expenses. The public status of the target can take values {private, public, subsidiary}. The relative size is the ratio of deal value and the marketcap of the bidder, Stockpayment is a dummy equal to 1 when more than 50% of the transaction is paid with stocks. Percentage Cash/Stocks/Others denote the respective fraction on the consideration. Contested bid is a dummy equal to 1 if there is at least one company challenging the bidder.

	Non-diversifying vs. Diversifying			Without experience vs. Experience		
	Non-div.	Div.	Diff.	No exp.	With exp.	Diff.
CAR	0.000	0.005	-0.006**	0.004	0.012	-0.008*
Leverage	0.147	0.151	-0.004	0.148	0.161	-0.013
Tobin's q	2.792	2.475	0.317*	2.384	2.862	-0.478
Size	8.191	7.967	0.224***	7.971	7.952	0.018
Free cash flow	0.035	0.034	0.002	0.033	0.038	-0.005
Cash flow / TA	0.306	0.346	-0.041***	0.359	0.291	0.068***
Stock deal	0.443	0.307	0.136***	0.292	0.369	-0.077**
All-cash deal	0.282	0.358	-0.076***	0.366	0.324	0.041
Relative deal size	0.242	0.224	0.018	0.199	0.331	-0.132***
Public target	0.401	0.297	0.104***	0.291	0.324	-0.033
Privat target	0.298	0.325	-0.027*	0.326	0.32	0.006
Subsidiary target	0.295	0.371	-0.076***	0.376	0.351	0.025
GIM index	9.269	9.786	-0.517***	9.792	9.754	0.038
Age	54.174	54.761	-0.586**	54.759	54.769	-0.01
Tenure	13.843	13.739	0.104	14.838	8.991	5.847***

*** p<0.01, ** p<0.05, *p<0.1

Table 2.5: Experience in Target's Industry - Effects on Diversification

This table shows the regression of the mergers' cumulative abnormal stock price returns of the bidder (CAR) on different manager, deal, and company characteristics. The cumulative abnormal returns come from an event study using the Fama-French three-factor model and an event window from 1 day before the announcement until 1 day afterwards. TOP experience is a dummy that is equal to 1 if the CEO worked in a TOP position in the target's industry. Bidder and deal characteristics are in the appendix. All regressions include age, age squared, tenure, and tenure squared of the CEO at the date of the announcement of the merger. All standard errors are clustered by event date to account for cross-sectional correlation of stock returns.

Dependent variable: CAR	(1)	(2)
TOP-experience x diversifying	0.011	0.013
	[1.867]	[2.221]
Diversifying	0.000	-0.003
	[0.132]	[-1.060]
Bidder's size		-0.003
		[-3.682]
Tobin's q		0.000
		[-0.901]
Free cash flow		-0.002
		[-0.089]
Cash flow measure		-0.004
		[-0.575]
Leverage		0.03
		[2.941]
Relative deal size		-0.007
		[-1.522]
Stock deal		-0.007
		[-2.403]
All-cash deal		0.005
		[2.030]
Public target		-0.02
		[-7.203]
Private target		0.001
		[0.262]
Age		-0.002
		[-1.410]
Age square		0.000
		[1.486]
Tenure		0.000
		[-0.837]
Tenure square		0.000
		[0.860]
Intercept	-0.290	0.115
	[-13.595]	[1.812]
Year x Industry dummies	yes	yes
Observations	5,244	4,844

Table 2.6: Fixed effects

This subsample consists only of acquisitions of CEOs who made at least two diversifying acquisitions whereas he is experienced in one industry and inexperienced in the other. Bidder and deal characteristics are in the appendix. All regressions include age, age squared, tenure, and tenure squared of the CEO at the date of the announcement of the merger. All standard errors are clustered by event date to account for cross-sectional correlation of stock returns.

Dependent Variable = CAR	(1)
TOP-experience x diversifying	0.031
	[2.327]
Fixed Effects	yes
Year and Industry dummies	yes
Deal and Firm controls	yes
Observations	470
Clusters	213

Table 2.7: Other Industries or Companies

The table shows the regression of the mergers' cumulative abnormal stock price returns of the bidder (CAR) on different manager, deal, and company characteristics. The cumulative abnormal returns come from an event study using the Fama-French three-factor model and an event window from 1 day before the announcement until 1 day afterwards. Two different measures of experience are presented: TOP experience (TA) is a dummy that is equal to 1 if the CEO worked in a TOP position in the target's industry. TOP experience (other industry) are dummy variables equal to 1 of the CEO has experience in any other industry but the current one (industry of the acquirer). TOP experience (other companies) are dummy variables equal to 1 of the CEO has experience in any other company but the current one. Bidder and deal characteristics are in the appendix. All regressions include age, age squared, tenure, and tenure squared of the CEO at the date of the announcement of the merger. All standard errors are clustered by event date to account for cross-sectional correlation of stock returns.

Dependent Variable: CAR	(1)	(2)	(3)	(4)
TOP-experience (TARGET) x diversifying				0.016
				[2.461]
TOP-experience (other Ind.) x diversifying			0.002	-0.004
			[0.593]	[-0.993]
TOP-experience (TARGET) x diversifying				0.013
				[2.188]
TOP-experience (other comp.) x diversifying			0.003	-0.001
			[0.734]	[-0.217]
Year x Industry dummies	yes	yes	yes	yes
Deal and Firm controls	yes	yes	yes	yes
Observations	4,844	4,844	4,844	4,844

Table 2.8: Target Heterogeneities

In specification (1) the public status (public, private, subsidiary) is analyzed. In specification (2) and (3) of the model we split the sample along the index of managerial discretion of the target's industry. In column (2) we use an index developed by Hambrick and Abrahamson (1995). We first match the index (when available) with the industry of the target before splitting the sample along the median value of the discretion index in our sample. In column (3) we use the index of managerial discretion of Metzger (2009) which constructed by analyzing the distribution of managers' fixed effects across industries. We first match the index with the industry of the target before splitting the sample along the median value of the discretion index in our sample. In specification (4) we split industries along the median value of the average R&D spending in high and low R&D industries. In specification (5) we split industries along the median value of the average intangibles in high and low intangibles industries. The table shows the regression of the mergers' cumulative abnormal stock price returns of the bidder (CAR) on different manager, deal, and company characteristics. The cumulative abnormal returns come from an event study using the Fama-French three-factor model and an event window from 1 day before the announcement until 1 day afterwards. TOP experience is a dummy that is equal to 1 if the CEO worked in a TOP position in the target's industry. Bidder and deal characteristics are in the appendix. All regressions include age, age squared, tenure, and tenure squared of the CEO at the date of the announcement of the merger. All standard errors are clustered by event date to account for cross-sectional correlation of stock returns.

Dependent Variable: CAR	(1)	(2)	(3)	(4)	(5)
Public - TOP-exp. x div.	0.006				
	[0.711]				
Private - TOP-exp. x div.	0.029				
	[2.649]				
Subsidiary - TOP-exp. x div.	0.005				
	[0.534]				
Discretion high - TOP-exp. x div.		0.02	0.016		
		[1.933]	[2.182]		
Discretion low - TOP-exp. x div.		0.002	0.008		
		[0.225]	[0.934]		
R&D high - TOP-exp. x div.				0.019	
				[2.723]	
R&D low - TOP-exp. x div.				0.002	
				[0.236]	
Intangibles high - TOP-exp. x div.					0.017
					[1.987]
Intangibles low - TOP-exp. x div.					0.01
					[1.433]
Year x Industry dummies	yes	yes	yes	yes	yes
Deal and Firm controls	yes	yes	yes	yes	yes
Observations	4,844	4,844	4,844	4,785	4,785

Table 2.9: Combined CARs

This specification analyzes public targets only. The table shows the regression of the mergers' cumulative abnormal stock price returns of the bidder (AC), or the target (TA), and of the combined firm (AC-TA: weighted by market cap) on different manager, deal, and company characteristics. The cumulative abnormal returns come from an event study using the Fama-French three-factor model and an event window from 1 day before the announcement until 1 day afterwards. TOP experience is a dummy that is equal to 1 if the CEO worked in a TOP position in the target's industry. Bidder and deal characteristics are in the appendix. All regressions include age, age squared, tenure, and tenure squared of the CEO at the date of the announcement of the merger. All standard errors are clustered by event date to account for cross-sectional correlation of stock returns.

Dependent Variable: CAR	AC-TA	AC	TA
TOP-experience x div.	-0.023	0.02	0.011
	[-0.643]	[1.866]	[0.328]
Diversifying	-0.022	-0.004	-0.018
	[-2.033]	[-0.742]	[-0.941]
Year x Industry dummies	yes	yes	yes
Deal and Firm controls	yes	yes	yes
Observations	1,673	1,673	1,673

Table 2.10: Merger Waves

This subsample consists only of mergers that were announced during a merger wave. Harford (2005) provides a measure of clustered merger activity that specifies year, month and industry of a merger wave. We define a merger being part of a merger wave if it the acquirer belongs to the affected industry and the merger was announced any time in between 6 months before and 6 months after the date that is identified by Harford. We exclude waves that are due to deregulation. The table shows the regression of the mergers' cumulative abnormal stock price returns of the bidder (CAR) on different manager, deal, and company characteristics. The cumulative abnormal returns come from an event study using the Fama-French three-factor model and an event window from 1 day before the announcement until 1 day afterwards. TOP experience is a dummy that is equal to 1 if the CEO worked in a TOP position in the target's industry. Bidder and deal characteristics are in the appendix. All regressions include age, age squared, tenure, and tenure squared of the CEO at the date of the announcement of the merger. All standard errors are clustered by event date to account for cross-sectional correlation of stock returns.

Dependent Variable:CAR	(1)
Within wave - TOP-experience x diversifying	0.024
	[1.704]
Outside wave - TOP-experience x diversifying	0.011
	[1.836]
Year x Industry dummies	yes
Deal and Firm controls	yes
Observations	4,844

Table 2.11: Probability of Experienced Merger by Appointment Date

The table shows the regression of the a dummy that is equal to 1 if the merger is by a CEO that is experienced on the appointment of the CEO, different manager, deal, and company characteristics. The cumulative abnormal returns come from an event study using the Fama-French three-factor model and an event window from 1 day before the announcement until 1 day afterwards. TOP experience is a dummy that is equal to 1 if the CEO worked in a TOP position in the target's industry. Bidder and deal characteristics are in the appendix. All regressions include age, age squared, tenure, and tenure squared of the CEO at the date of the announcement of the merger. All standard errors are clustered by event date to account for cross-sectional correlation of stock returns.

Dep. Var: exp. merger	LPM (top-exp.)	Probit (top-exp.)
Appointment in t = 0	0.241	0.896
	[2.805]	[2.859]
Appointment in t = -1	0.108	0.486
	[2.377]	[2.629]
Appointment in t = -2	0.151	0.630
	[3.323]	[3.533]
Appointment in t = -3	0.211	0.812
	[5.181]	[5.201]
Appointment in t = -4	0.202	0.786
	[4.396]	[4.487]
Appointment in t = -5	0.141	0.599
	[2.903]	[3.125]
Appointment in t = -6	0.09	0.419
	[1.924]	[2.168]
Appointment in t = -7	0.046	0.237
	[0.926]	[1.093]
Appointment in t = -8	0.152	0.633
	[2.616]	[2.813]
Appointment in t = -9	0.074	0.36
	[1.208]	[1.392]
Appointment in t = -10	0.06	0.3
	[1.091]	[1.273]
Year x Industry dummies	yes	yes
Deal and Firm controls	yes	yes
Observations	1,240	1,240

Table 2.12: Merger Performance by Appointment Date

The table shows the regression of the mergers' cumulative abnormal stock price returns of the bidder (CAR) on the appointment of the CEO, different manager, deal, and company characteristics. The cumulative abnormal returns come from an event study using the Fama-French three-factor model and an event window from 1 day before the announcement until 1 day afterwards. TOP experience is a dummy that is equal to 1 if the CEO worked in a TOP position in the target's industry. Bidder and deal characteristics are in the appendix. All regressions include age, age squared, tenure, and tenure squared of the CEO at the date of the announcement of the merger. All standard errors are clustered by event date to account for cross-sectional correlation of stock returns.

Dependent Variable: CAR	(1)
Appointment in t=-1 and Top experience x div.	0.011
	[0.590]
Appointment in t=-2 and Top experience x div.	0.013
	[0.968]
Appointment in t=-3 and Top experience x div.	0.027
	[1.700]
Appointment in t=-4 and Top experience x div.	-0.002
	[-0.192]
Appointment in t=-5 and Top experience x div.	-0.012
	[-1.218]
Appointment in t=-6 and Top experience x div.	0.03
	[2.433]
Appointment in t=-7 and Top experience x div.	-0.014
	[-0.939]
Appointment in t=-8 and Top experience x div.	0.039
	[2.187]
Appointment in t=-9 and Top experience x div.	-0.005
	[-0.196]
Appointment in t=-10 and Top experience x div.	0.005
	[0.341]
Div ff12	-0.003
	[-1.065]
Year x Industry dummies	yes
Deal and Firm controls	yes
Observations	4,711

Table 2.13: All experience and unrelated experience

In this sample we analyze experience of low hierarchy levels or experience that is unrelated to the actual business of an company. Examples are internships in a particular industry or working as a web programmer in the automotive industry. The table shows the regression of the mergers' cumulative abnormal stock price returns of the bidder (CAR) on different manager, deal, and company characteristics. The cumulative abnormal returns come from an event study using the Fama-French three-factor model and an event window from 1 day before the announcement until 1 day afterwards. Experience in target's industry is a dummy that is 1 if the CEO has experience in the target's industry. Unrelated experience is a dummy that is equal to 1 if the CEO worked in a position that is likely to be unrelated with the industry in the firm. Examples are low-ranked jobs like office workers or interns as well as non-business positions in the target's industry. Bidder and deal characteristics are in the appendix. All regressions include age, age squared, tenure, and tenure squared of the CEO at the date of the announcement of the merger. All standard errors are clustered by event date to account for cross-sectional correlation of stock returns.

Dependent Variable: CAR	(1)	(2)
Any experience x diversifying	0.010	
	[2.369]	
Unrelated-experience x diversifying		0.004
		[0.684]
Diversifying	-0.004	-0.001
	[-1.532]	[-0.513]
Year x Industry dummies	yes	yes
Deal and Firm controls	yes	yes
Observations	4,844	4,844

Table 2.14: Recency

This table analyzes the different effect of the recency of the experience on the performance. We make two different splits of the experience by recency. The experience was obtained i) less than 10 years ago vs. more than 10 years ago and ii) less then 5 years ago vs. between 5 and 10 years ago vs. more than 10 years ago. The table shows the regression of the mergers' cumulative abnormal stock price returns of the bidder (CAR) on different manager, deal, and company characteristics. The cumulative abnormal returns come from an event study using the Fama-French three-factor model and an event window from 1 day before the announcement until 1 day afterwards. TOP experience is a dummy that is equal to 1 if the CEO worked in a TOP position in the target's industry. Bidder and deal characteristics are in the appendix. All regressions include age, age squared, tenure, and tenure squared of the CEO at the date of the announcement of the merger. All standard errors are clustered by event date to account for cross-sectional correlation of stock returns.

Dependent Variable: CAR	(1)	(2)
TOP-experience (less than 10 years ago) x diversifying	0.020	
	[2.624]	
TOP-experience (more than 10 years ago) x diversifying	-0.003	
	[-0.259]	
TOP-experience (less than 5 years ago) x diversifying		0.009
		[0.892]
TOP-experience (between 5 and 10 years ago) x diversifying		0.032
		[2.921]
TOP-experience (more than 10 years ago) x diversifying		-0.003
		[-0.253]
Diversifying	-0.002	-0.002
	[-0.915]	[-0.922]
Year x Industry dummies	yes	yes
Deal and Firm controls	yes	yes
Observations	4,844	4,844

Table 2.15: No conglomerates

In this sample we exclude conglomerates from our analysis. Columns (1) and (2) report regression results of firms that have business in only one segment according to the COMPUSTAT segment data. In columns (3) and (4) we consider only firms where the biggest segment is accountable for at least 90% of the total sales. The table shows the regression of the mergers' cumulative abnormal stock price returns of the bidder (CAR) on different manager, deal, and company characteristics. The cumulative abnormal returns come from an event study using the Fama-French three-factor model and an event window from 1 day before the announcement until 1 day afterwards. TOP experience (TA) is a dummy that is equal to 1 if the CEO worked in a TOP position in the target's industry. Bidder and deal characteristics are in the appendix. All regressions include age, age squared, tenure, and tenure squared of the CEO at the date of the announcement of the merger. All standard errors are clustered by event date to account for cross-sectional correlation of stock returns.

Dependent Variable: CAR	(1)	(2)
Conglomerate - TOP-experience x diversifying	0.012	0.01
	[1.591]	[1.319]
Focussed firm - TOP-experience x diversifying	0.038	0.034
	[2.485]	[2.625]
Diversifying	-0.005	-0.005
	[-1.648]	[-1.523]
Difference	0.026	0.024
Year x Industry dummies	yes	yes
Deal and Firm controls	yes	yes
Observations	1,336	1,549

Table 2.16: Diversifying only

This subsample consists only of diversifying acquisitions. The table shows the regression of the mergers' cumulative abnormal stock price returns of the bidder (CAR) on different manager, deal, and company characteristics. The cumulative abnormal returns come from an event study using the Fama-French three-factor model and an event window from 1 day before the announcement until 1 day afterwards. TOP experience is a dummy that is equal to 1 if the CEO worked in a TOP position in the target's industry. Bidder and deal characteristics are in the appendix. All regressions include age, age squared, tenure, and tenure squared of the CEO at the date of the announcement of the merger. All standard errors are clustered by event date to account for cross-sectional correlation of stock returns.

Dependent Variable: CAR	(1)
TOP-experience x diversifying	0.01
	[2.004]
Year x Industry dummies	yes
Deal and Firm controls	yes
Observations	1,189

Table 2.17: 11 days event window

The table shows the regression of the mergers' cumulative abnormal stock price returns of the bidder (CAR) on different manager, deal, and company characteristics. The cumulative abnormal returns come from an event study using the Fama-French three-factor model and an event window from 5 day before the announcement until 5 day afterwards. TOP experience is a dummy that is equal to 1 if the CEO worked in a TOP position in the target's industry. Bidder and deal characteristics are in the appendix. All regressions include age, age squared, tenure, and tenure squared of the CEO at the date of the announcement of the merger. All standard errors are clustered by event date to account for cross-sectional correlation of stock returns.

Dependent Variable: CAR	(1)
TOP-experience x diversifying	0.013
	[2.220]
Diversifying	-0.003
	[-1.109]
Year x Industry dummies	yes
Deal and Firm controls	yes
Observations	4,844

2.8 Data Apendix

Table 2.18: Definition of variables

Variable	Definition
Panel A : Bidder characteristics	
Leverage	Book value of debts over market value of total assets.
Tobin's Q	Ratio of market value of assets to book value of assets. The market value of total assets is defined as the book value of total assets plus market capitalization minus book value of equity. The market capitalization is computed as common shares outstanding times the fiscal year closing price. The book value of equity is defined as stockholders' equity minus preferred stock liquidating value plus balance sheet deferred taxes and investment credit minus post retirement assets.
Size	Logarithm of the book value of total assets
Free cash flow	Operating income before depreciation minus interest expense minus income taxes minus capital expenditures, scaled by book value of total assets.
Cash flow / TA	Operating cash flows (sales minus costs of good sold minus selling and administrative expenses plus depreciation and goodwill expenses) over total assets.
Panel B : Deal characteristics	
Stock deal	A dummy that is equal to 1 if the bidder pays a positive fraction of the transaction value with its stocks.
All-cash deal	A dummy that is equal to 1 if the transaction is 100% paid with cash.
Relative deal size	Ratio of the deal value and the market capitalization of the bidder.
Public target	Status of the target is "public company".
Private target	Status of the target is "private company".
Subsidiary target	Company is a subsidiary of a company.
Diversifying dummy	We classify a merger to be diversifying if bidder and target differ in their Fama-French 12-Industries (FF12) classification.
Panel C : Other variables	
Age	Finally we measure the age (in years) of the CEO at the announcement of the merger.
Tenure	The tenure of the CEO in the current company (in years).
CARs	Three-day (eleven-day) cumulative abnormal return (in percentage points) calculated using the Fama-French 3-factor model. The market model parameters are estimated using the return data for the period (-270,-21).

3 Mergers and Acquisitions Accounting Can Explain the Diversification Discount

3.1 Introduction

Most studies of corporate diversification find that conglomerates are on average valued less than industry-matched portfolios of focused firms.[24] Several strands of research attempt to explain this so-called diversification discount. First, conglomerates might be less efficient than standalones for instance, due to agency costs or inefficient internal capital markets.[25] Second, the diversification discount might be driven by self-selection and the endogeneity of the decision to diversify.[26] Last, biases caused by data and measurement problems can generate a spurious diversification discount.[27] This paper identifies mergers and acquisitions (M&A) accounting as a source of measurement bias in Tobin's q.[28] The typical M&A accounting procedure, the purchase method of business combinations, normally leads to a mechanical increase in the acquired assets' book value and therefore to a drop in the acquirer's market-to-book ratio, the usual proxy for Tobin's q.[29] Because conglomerates are more acquisitive than standalones, this accounting method can generate a spurious diversification discount. I partially correct q by excluding goodwill from the book value of assets and I find that this accounting artifact explains a sizeable part, if not all, of the diversification discount. In addition, I use the exogenous event of a change in the US M&A accounting rules to confirm this hypothesis.

My argument rests on two premises. First, the purchase method creates a mechanical downward bias in the q of acquisitive firms. Second, conglomerates are more acquisitive than standalones. I start by discussing the validity of these premises.

Consider the first premise. The purchase method consists in recognizing the fair value of the acquired net assets and any acquired goodwill in the acquirer's balance sheet.[30] As a consequence, the post-merger book value of acquired assets equals the

[24] Wernerfelt and Montgomery (1988), Lang and Stulz (1994), Berger and Ofek (1995), Comment and Jarrel (1995), Servaes (1996), Lins and Servaes (1999), Rajan, Servaes and Zingales (2000) and Lamont and Polk (2002) find evidence of a diversification discount. Laeven and Levine (2007) find a discount in financial conglomerates.

[25] Jensen (1986) and Denis, Denis and Sarin (1997) suggest conglomerates are less efficient due to agency costs; Scharfstein and Stein (2000) and Rajan, Servaes and Zingales (2000) due to inefficient internal capital markets.

[26] Villalonga (2004a), Campa and Kedia (2002), Maksimovic and Phillips (2002), Graham, Lemmon and Wolf (2002).

[27] Villalonga (2004b).

[28] Market-to-Sales, Market-to-EBIT and ROA have also been used as measures of performance. However, most studies use q as their main or only specification.

[29] For the remainder of the paper I use "q" to refer to the empirical measure of Tobin's q typically used in this literature, i.e. the market-to-book ratio of assets, rather than to the economic theoretical concept.

[30] SFAS 141 defines goodwill as the excess of the consideration transferred plus the fair value of any noncontrolling interest in the acquiree at the acquisition date over the fair values of the identifiable net assets acquired. The fair value of assets corresponds to the amount at which these asset could be bought or sold in a current transaction between willing parties other than liquidation. In the case

transaction price. Because the transaction price typically exceeds the pre-merger market value of the target's assets, which itself typically exceeds its pre-merger book value, this implies that post-merger book value of target's assets exceeds its pre-merger book value. For this reason, the acquirer's market-to-book ratio of assets often drops. While other merger effects (e.g. synergies) may increase the assets' market value, they are typically too small to completely offset the effect of the increase in book value on market-to-book.[31]

I model the purchase method's impact on post-merger acquirer's q and deal excess-value. I define deal excess-value as the difference between the merged firm's q and that of a portfolio including the acquirer and the target as standalones. I argue that a target's q higher than one and a transaction premium higher than the value of synergies, together, are sufficient conditions to generate a negative deal excess-value. This result, in particular, helps to reconcile the diversification discount with the M&A literature. On the one hand, it is consistent with the q of conglomerates being lower than an equivalent portfolio of standalones; on the other hand it is also consistent with acquirers overpaying for the target firm and synergies.[32]

From this model, I derive a set of additional empirical predictions, which I test using M&A data from SDC Platinum over 1984-2007, and I find strong support for them. In particular, I find that M&A has a negative impact on q: The acquirer's q drops on average by 12% between the pre-merger end of quarter and the post-merger end of quarter. However, this drop can be explained by the use of the purchase method. Indeed, it disappears once I correct the acquirer's post-merger book value by subtracting the transaction premium paid above the target's book value. This result is true for both diversifying and other deals.

Consider now the second premise i.e. that conglomerates make more acquisitions than standalones. Merging M&A data with COMPUSTAT Segments data for 1988-2007, I find a strong positive correlation between the number of past deals and diversification. Furthermore, conglomerates have, on average, higher goodwill-to-assets ratios suggesting that they do not only make more acquisitions, but also do so with more goodwill.

These premises established, I turn next to their effect on the diversification discount. First, I replicate the usual conglomerate studies regressions in my COMPU-

of liabilities, the fair value is the amount at which these liabilities could be incurred or settled in a current transaction between willing parties, other than liquidation. When there is an available quoted market price this is the value to be used as a basis for the measurement, whenever this is not available, an estimate using the best information available should be used.

[31] See Ohlson (1995) and Feltham and Ohlson (1995) for a model of the relation between a firm's market value and accounting data. The models parameters represent persistence of abnormal earnings, growth and accounting conservatism. Accounting conservatism is the notion that the long run market to book ratio exceeds one when economic assets are excluded from the balance sheet. See Zeff and Dharan (1997) on the role of goodwill in financial statement analysis.

[32] Most event studies on M&A find that these transactions tend to add value for shareholders, but that most of the gains accrue to the target. In addition, acquirers tend to show negative abnormal returns after the mergers' announcement (see Andrade, Mitchell and Stafford (2001) for a survey of this literature).

STAT Segments sample and find a diversification discount between 0.03 and 0.09.[33] Next, I try to adjust for the impact of M&A accounting. However, the difference between the transaction price and the pre-merger target's book value is not directly observed in financial statements: Goodwill is reported but the rest is imputed directly to purchased assets. Therefore, I use goodwill as a conservative correction and subtract it from the merged firm's book value of assets. This conservative correction reduces the diversification discount by 40% on average and in some specifications the diversification discount becomes not statistically different from zero. This result shows that much of the diversification discount can be explain by M&A accounting. Moreover, because my correction is conservative, this result understates the impact of M&A accounting on the diversification discount.

Because the goodwill correction is not the ideal adjustment, I construct a differences-in-differences test that does not rely on this correction. Before 2001 firms could use either the purchase method or the pooling method in which no goodwill is recognized and which therefore does not generate the spurious change in q.[34] I use the exogenous shock of a change in US M&A accounting rules (SFAS 142) in 2001 that eliminates the pooling method and makes the purchase method mandatory[35] and I exploit the time-series and cross sectional variation of the diversification discount. First, I expect the uncorrected diversification discount to increase after 2001 because more firms use the purchase method. I find an additional discount between 0.02 and 0.07 for diversified firms post-2001. Second, the diversification discount should be smaller in industries that have lower goodwill, either due to lower M&A activity or to acquisitions with lower goodwill, because the assets' book value of conglonerates is less inflated. I rank industries based on the average goodwill-to-assets ratio. I define a conglomerate's 1-digit SIC code as that of the segment with the highest sales.[36] I observe no statistically significant diversification discount in the bottom goodwill industry and a higher-than-average diversification discount in the top goodwill industry. These cross sectional and time-series variations form the basis of my differences-in-differences estimation. I find that the change in M&A accounting rule generates a higher increase in the non-adjusted diversification discount for the top goodwill industry than for the bottom goodwill industry. Again, this evidence is consistent with the purchase method generating a spurious diversification discount.

Since subtracting goodwill is a conservative adjustment, I analyze in detail a sample of 20 firms, which I can identify as reporting multiple business segments for the first time and using the purchase method in the corresponding acquisition. For these firms I can observe the difference between transaction price and target's book value.

[33] Berger and Ofek (1995) find a diversification discount of 0.12, although their sample is restricted to 1986-1991. Bevelander (2002) finds a 0.08 discount using an extended sample: 1980-1998.

[34] In order to use the pooling method firms had to meet a set of 12 criteria.

[35] See Beatty and Weber (2006) and Bens (2006) for a detailed examination of SFAS 142.

[36] By using a coarser industry classification I make sure that more conglomerates' business segments share this same industry. More than 50% of secondary segments share the same 1-digit SIC code with the highest sales segment.

In this (admittedly very small) sub-sample goodwill reflects 56% of the total difference between the transaction price and the target's book value. Using this ratio to extrapolate to the full sample, I find a significant diversification premium between 0.02 and 0.03 in most specifications.

To summarise, the measurement error generated by M&A accounting seems to play a first order role for the diversification discount as usually estimated. Correcting for this accounting artefact may very well eliminate the average discount.

This paper is mainly related to papers that identify data and measurement issues relevant for the conglomerate discount. Whited (2001) also examines measurement error in q but focuses on its impact on investment regressions for conglomerates, in which q is an independent variable. In my study instead, q is a dependent variable. In this case, measurement error would not be a problem if it were not systematically related to independent variables. However, it is in fact systematically related to the diversification dummy. In my study, I identify M&A accounting as a specific source of measurement error in q, I show it to be first-order, and propose a partial fix. Villalonga (2004b) finds a diversification premium using an alternative dataset to COMPUSTAT-segments and suggests the discount may be an artifact of segment-level data. She offers two possible explanations: "relatedness" and "strategic accounting". She suggests that Compustat-segments data is reported in such a way that mostly unrelated diversification is captured and this generates a discount. The strategic accounting explanation suggests that firms self report their data in a ways that make them look artificially underperforming with respect to standalones.

Bevelander (2002) shows shows that q is higher for younger firms and that much of the average diversification discount can be explained by the fact that conglomerates tend to be older than standalones. One possible explanation for younger firms higher q is due to their greater growth opportunities. My study suggests M&A accounting as an alternative explanation: it is likely that younger firms have made less acquisitions than older ones. Massa and Zhang (2009) argue that conglomerates have a lower q simply because they are less financially constrained and therefore exercise their growth opportunities.

Graham, Lemmon and Wolf (2002) also link the conglomerate discount to M&A activity. They show that conglomerates acquire low q targets, which can explain the discount. Their argument is therefore based on self-selection, which is very different from my measurement error argument.

My results are consistent with Schoar (2002), who finds a diversification discount using stock market performance, but shows that conglomerates can be more productive than standalones using plant level data. She argues that this discrepancy can be attributed to conglomerates leaving more rents to workers, which explains 30% of the diversification discount. I provide an alternative explanation for this discrepancy.

Finally, this paper is related to the M&A accounting literature. This literature has mainly focused on market reactions to the adoption of different accounting methods for

business combinations and on the implications of different methods of accounting for goodwill (see Hong, Kaplan and Mandelker (1978) and Hopkins, Houston and Peters (2000)). Jennings, Robinson, Thompson and Duvall (1996) find evidence of a positive correlation between goodwill and market value supporting the view that goodwill should be recognized as an asset. I contribute to this literature by showing that recognizing goodwill affects the comparability of market-to-book ratios, in particular when comparing diversified to standalone firms. In addition, I suggest a simple way to improve this measure in order to make it comparable between firms with different levels of M&A activity.

The paper proceeds as follows. Section 2 discusses M&A accounting's effect on q and the diversification discount. Section 3 presents the data and methodology. Section 4 reports the empirical results. Section 5 discusses them and shows robustness tests. Section 6 concludes.

3.2 M&A Accounting and the Diversification Discount

3.2.1 M&A Accounting

Until 2001, firms engaging in M&A could use one of two accounting methods: the pooling-of-interests or the purchase method. These methods differ mainly in the way the target's net assets are reported in the merged firm's balance sheet. In the pooling method, the book values of the target's assets and liabilities are simply added to the acquirer's. In the purchase method the acquirer reports the target's net assets at fair value, and capitalizes as goodwill any premium paid in excess of this fair value. The fair value is determined by reference to observable prices of market transactions for similar assets or liabilities at or near the measurement date whenever that information is available.[37] Otherwise, fair value is estimated using other valuation techniques. The main implication of interest for my analysis is that the acquired assets' book value does not change after a merger in the pooling method but does in the purchase method.

The pooling method was only applied to "mergers of equals." To qualify for this accounting treatment the transaction had to satisfy 12 requirements related to its structure (e.g. at least 90% of the transaction currency had to be stock), the characteristics of the firms (the entities involved had to be autonomous and independent) and to the absence of planned transactions after the deal that involved common stocks issued as part of the combination or any assets of the target company.[38] If these requirements were not met, the purchase method was applied. A large majority of firms used the purchase method.[39] Since June 30, 2001 all firms have to use the purchase method. Two main additional changes occurred. Before 2001 goodwill was amortized

[37] See SFAS 141 and December 11, 2002 FASB meeting minutes on "Business Combinations: Purchase Method Procedures" for further details.

[38] See Accounting Principles Board (APB) Opinion 16 for further details.

[39] 14% of M&A deals in my sample use the Pooling of Interests method.

during a period of up to 40 years. Since 2001, goodwill is no longer subject to amortization but tested for impairment at least annually. The impairment test consists in comparing the carrying amount of goodwill and its fair value and recognizing a loss whenever the former amount exceeds the latter. Existing goodwill from previous acquisitions are subject to the same treatment. Second, before 2001, intangible assets were recognized as separate assets whenever they could be identified and named; since 2001, they are only recognized as assets apart from goodwill if they meet one of two criteria: the contractual-legal criterion or the separability criterion. The contractual-legal criterion states that the intangible assets must arise from contractual or other legal rights (e.g. trademarks, patents). According to the second criteria the intangible asset can only be recognised if it is could be separated from the acquired entity and sold, transferred, licensed, rented or exchanged (e.g. costumer lists, databases).

3.2.2 Tobin's q

I compare the pooling and the purchase methods' implications for merged companies' q.[40]

Consider firm A (the acquirer) buying firm T (the target) to form firm AT. M_i is the pre-merger market value of firm $i = A, T$ and B_i its book value. Combining A and T generates (positive or negative) synergies S. To acquire T, A pays a (positive or negative) premium P relative to its market value M_T. A fraction c of the transaction price $(M_T + P)$ is paid in cash from internal funds; the remainder being externally financed.[41] T is an all equity firm. [42] Firm i's q (the empirical measure of Tobin's q) is defined as $q_i = \frac{M_i}{B_i}$, its common measure in the discount literature.

Following the merger,the market value of AT is the sum of A and T's market values $(M_A + M_T)$ plus the synergies S, minus the internal funds spent $c(M_T + P)$.[43] It's book value, however, depends on the accounting method used. Under the pooling method, the book value of AT corresponds to $B_A + B_T - c(M_T + P)$, the sum of the book values of A and T minus the internal funds spent. Under the purchase method the target's assets are reported at the transaction price $M_T + P$ and not at the pre-merger book value B_T.

Lemma 1 *The q of the combined firm under the pooling method and the purchase method is repectively:*

$$q_{AT}^{Pooling} = \frac{M_A + M_T - c(M_T + P) + S}{B_A + B_T - c(M_T + P)} \tag{3.1}$$

[40] Doing so, I ignore the requirements for using the pooling method, which I use as a benchmark.

[41] External financing includes equity or debt financing. This may as well correspond to a cash payment for the target, but this cash is obtained externally and does not correspond to internally generated funds.

[42] If the target is not all-equity financed then the acquirer pays the market value of net assets (total assets minus total liabilities) plus a premium P. This does not affect the main results.

[43] I assume the market value of internal funds equals their book value.

$$q_{AT}^{Purchase} = \frac{M_A + M_T - c(M_T + P) + S}{B_A + (M_T + P)(1 - c)} \tag{3.2}$$

I define two variables of interest, both of which depend on the M&A accounting method used. First, through the acquisition, the acquirer's q increases by

$$\Delta q \equiv q_{AT} - q_A \tag{3.3}$$

Second, I define the deal's excess value as the difference between the q of the merged firm and that of a portfolio combining the acquirer and the target pre-merger:

$$EV \equiv q_{AT} - \frac{M_A + M_T}{B_A + B_T} \tag{3.4}$$

I now derive a set of empirical predictions. For this purpose I focus on the case where $c = 0$.[44]

Prediction 1 *Under the pooling method, Δq is increasing in the target's q and in synergies. Under the purchase method, Δq is independent of the target's q.*

Because under the pooling method the target is recognised in the books of the mergerd firm at its pre-merger book value, the post-merger q is a combination of target's and acquirer's pre-merge qs. Therefore, the change in q is only positive when $q_A < q_T + \frac{S}{B_T}$, i.e., when the q of the target pre-merger plus the synergies is higher than the acquirer's q before the transaction.

This is not the case when the purchase method is used. In this case, the post-merger q of the combined firm is independent of the target's book value and, thus, of its q. Thus, Δq is also independent of the target's q. In fact,the impact on q_A is positive if and only if $q_A < \frac{M_T+S}{M_T+P}$.

In fact, prediction 1 implies that we can observe contradicting changes in acquirer's q between the pooling (my benchmark) and the purchase method for mergers satisfying the same conditions. For instance, we can observe a drop in q when the purchase method is used that would correspond to an increase in the case of the pooling. This particular situation occurs whenever $\frac{M_T+S}{M_T+P} < q_A < q_T + \frac{S}{B_T}$, what happens for a significant proportion of deals.[45]

Prediction 2 *Under the purchase method and assuming that the premium paid above the target's market value is greater or equal to the synergies, then Δq is positive (negative) if and only if pre-merger q is less (greater) than one.*

If we assume that the acquirer pays exactly a premium equal to the value of synergies then the impact in q_A is only positive when $q_A < 1$. Intuitively, because in

[44] In the case of the pooling method c is always lower than 0.1 and most frequently zero. Under the purchase method the situations in which c is higher than zero occur only when cash is used as mean of payment and corresponds to retained earnings.

[45] Assuming $P \geqslant S > 0$, a necessary condition for this conflicting result is that $q_T > 1$, which in my sample occurs for approximately 95% of the deals.

this case the target is recognised in the books of the merged firm at it's market value plus synergies, it works as if the acquirer was merging with a firm with a q of 1. Thus, its q drops if higher than 1 pre-merger and increases otherwise.

In the case under which $P > S$, i.e., when the acquirer overpays for the synergies, q_A drops whenever $q_A > (1 - \alpha)$, where $\alpha > 0$.

Prediction 3 *Under the pooling method, the deal-excess value is independent of target's q and increasing in synergies. Under the purchase method the deal excess value is decreasing in the difference betweeen transaction price and target's book value and increasing in synergies.*

Under the pooling method, the deal excess-value corresponds exactly to the synergies generated by merging A and T standardized by the book value of AT post-merger, i.e., $\frac{S}{B_A+B_T}$. Absent synergies, deal-excess value is zero. In both cases, excess value is independent of target's q. On the contrary, under the purchase method, the deal excess-value does not simply depend on the value of synergies and it is not independent from target's q. In fact, because the merged firm's book value increases by the transaction price when the purchase method is used, the deal excess value under this method is decreasing in the ratio of transaction price to the target's pre-merger book value. This implies that deal-excess value tends to be lower when high q targets are acquired and when the acquirer pays an high premium paid above the target's maket value.

This might generate an over or underestimation of deal excess value under the purchase method when compared to the pooling. In fact, deal excess value is overestimated whenever $EV^{Purchase} > EV^{Pooling}$, i.e., when $\frac{M_T+P}{B_T} < 1$, and is underestimated when $\frac{M_T+P}{B_T} > 1$. Because for almost all acquisitions the price paid for the target is above its pre-merger book value, the deal excess-value tends to be significantly underestimated.

Prediction 4 *Under the purchase method, $q_T > 1$ and $P > S$ are sufficient conditions for a negative deal excess-value.*

Under the purchase method, deal excess value corresponds to $\frac{M_A+M_T+S}{B_A+M_T+P} - \frac{M_A+M_T}{B_A+B_T}$ and, therefore $\frac{M_T}{B_T} > 1$ and $P > S$ necessarily imply a negative deal excess value. The first condition is known to be true for most of the deals. However, even when the target's q is 1 and synergies are positive, if the premium paid above target's market value is higher than the value of synergies, this implies a negative deal excess-value.

And indeed, the empirical evidence on M&A suggests that this is the case. First, most event studies seem to argue that mergers and acquisitions create value, which is consistent with positive synergies. This, despite most gains accruing to the target company and acquirers experiencing zero or negative abnormal returns, which is

consistent with acquirers overpaying , or at least, not underpaying for the targets.[46]

3.2.3 Empirical Implications and Testable Hypotheses

The Diversification Discount A standard procedure in the diversification discount literature consists in computing the excess value of a conglomerate. A common specification of this measure compares a conglomerates' observed q with the q of a industry-matched portfolio of standalones. However, these standalones are probably smaller, younger and have performed fewer acquisitions than the conglomerate. With respect to this later characteristic, we expect the standalone firms to have lower q because they have not used M&A accounting as much as conglomerates. In this sense, the excess value measure as previously measured in the literature, should be have a downward bias. The main implication that follows is that the average diversification discount, once corrected for the impact of the accounting procedure, both for stand-alone and diversified firms, should be lower or otherwise, a premium.

The Differences-in-Differences Test My argument has two main cross-sectional and time-series implications that allow me to implement a differences-in-differences test.

In the time series, the change in accounting rule in 2001 is expected to generate an increase in the diversification discount because all firms are obliged to apply the purchase method. The firms that under the past conditions would use the pooling method, have to use the purchase method instead. Again, if diversified firms are more acquisitive than standalones, and if these last do not systematically use the pooling method pre-2001, this change is expected to create an additional diversification discount post-2001. I test this hypothesis using the following specification:

$$EV_{it} = \beta_0 + \beta_1 dDIV_{it} + \delta_0 dPOST2001 + \delta_1 dDIV_{it} \cdot dPOST2001 + \beta_2 X_{it} + \varepsilon_{it} \quad (3.5)$$

Where EV is firm i's excess value at year t, $dDIV$ is a diversification dummy, $dPOST2001$ is a post-2001 dummy and X a set of firm controls. The coefficient of interest is δ_1 that captures if diversified firms show an additional discount after the accounting rule's change.

On the cross section, we expect the diversification discount to be more severe in industries where firms acquire with higher prices above the target's book value and

[46] Byrd and Hickman (1992), Healy Palepu and Ruback (1992), Kaplan and Weisbach (1992), Mulherin and Boone (2000) and Andrade et. al (2001) all find negative cumulative abnormal returns for the acquirer between -3.8% and -0.37% and combined cumulative abnormal returns between +1.8% and +9.1%.

therefore, with more goodwill. One issue consists in defining the conglomerate's industry. There are two main alternatives: either using the core-business' industry or using the most relevant secondary industry. The second alternative has the advantage of coinciding with the industry of most of the conglomerate's targets (From the previous section we know that the diversification discount is increasing in the target's goodwill). However, for my differences-in-differences test I need the firms to be randomly assigned to the control and treatment groups, in this case to the high or low goodwill industry, i.e., I want to make sure that the secondary industry choice was not made taking into account the effect of M&A accounting. Therefore, I define the conglomerates' industry as the industry of it's core business defined at the 1-digit SIC code.[47] By using a coarse industry definition I make sure that most of the acquisitions performed by these conglomerates take place in the same SIC code and therefore targets to have been acquired with high goodwill.[48] To test this hypothesis I use the following econometric specification:

$$EV_{it} = \beta_0 + \beta_1 dDIV_{it} + \delta_0 dHGW_i + \delta_1 dDIV_{it} \cdot dHGW_i + \beta_2 X_{it} + \varepsilon_{it} \qquad (3.6)$$

Where $dHGW$ is a high goodwill dummy, being one if the firm is in a high goodwill industry. The coefficient of interest corresponds to the the interaction term between the diversification dummy and the high goodwill dummy. We expect δ_1 to be negative, meaning that a higher diversification discount is observed in high goodwill industries.

I proceed with the diferences-in-diferences methodology. The cross-sectional heterogeneity across industries in terms of goodwill allows me to define a treatment and a control group that are expected to have different responses to the 2001 change in accounting rules. The treatment group corresponds to diversified firms in the top goodwill industry, and the control group to diversified firms in the bottom goodwill industry. This change in the accounting rules is an exogenous shock to the firms and we expect diversified firms in industries with different levels of goodwill to be affected in different ways. We expect the post-2001 increase in the diversification discount to be greater for firms in the top goodwill industry. The equation for analyzing the impact of this change in accounting regulation in the two groups is formalized in the following way:

$$EV_{it} = \beta_0 + \beta_1 dHGWD_i + \delta_0 dPOST2001 + \delta_1 dPOST2001 \cdot dHGWD_i + \beta_2 X_{it} + \varepsilon_{it} \qquad (3.7)$$

Where $dHGWD$ is a high goodwill dummy, being one if the diversified firm is in a high goodwill industry, $dAFTCHANGE$ is a post-2001 dummy and X a set of firm controls. The coefficient of interest is δ_1 because it captures the additional impact of the change in the accounting rule for diversified firms in high goodwill industries

[47] I define the core-business as the main industry reported in COMPUSTAT. This corresponds to the industry of the business segments with the highest sales.

[48] Approximately 60% of the secondary business segments are in the same 1-digit SIC code as the conglomerate's core-business.

with respect to diversified firms in low goodwill industries. I expect the increase in the diversification discount to be greater for the top goodwill industry and therefore δ_1 is expected to be negative.

This analysis assumes that the top goodwill industry and the low goodwill industries do not respond heterogeneously to the change in accounting rule in terms of acquisitions strategies. More precisely, that high goodwill firms do not perform more value destroying acquisitions post-2001. But even if we assume they do change their M&A policy in response to this change, the most plausible strategy for high goodwill firms after 2001 is to acquire less, in order not to suffer from the mechanical drop in q. If this is the case, my interpretation would not be affected. In fact, the diversification discount would even be bigger in the top goodwill industry post-2001.

Finally I run a triple-differences (or differences-in-differences-in-differences) estimator. The only difference for the previous estimator is the fact that the sample in use is not restricted to diversified firms. Therefore, using this methodology, we can still capture the effect of diversification per se. The econometric specification is as follows:

$$\begin{aligned} EV_{it} &= \beta_0 + \beta_1 dDIV_{it} + \beta_2 dHGW_i + \beta_3 dPOST2001 + \\ &+\delta_0 dDIV_{it} \cdot dHGW_i + \delta_1 dDIV_{it} \cdot dPOST2001 + \delta_2 dPOST2001 \cdot dHGW_i + \\ &+\delta_3 dDIV_{it} \cdot dHGW_i \cdot dPOST2001 + \beta_4 X_{it} + \varepsilon_{it} \end{aligned} \tag{3.8}$$

In this case the coefficient of interest is δ_3, which is expected to be negative, capturing the expected extra discount for diversified firms post-2001. This coefficient is equivalent to δ_1 in the previous specification.

3.3 Data and Measures

3.3.1 Data

I use deals data from the Thompson Financial SDC Platinum database. The initial sample contains all completed mergers and acquisitions in the US stock market over 1984-2007. To be included in the final sample, a transaction has to meet the following criteria: the deal status must be completed; the acquirer must own more than 50% of shares after the transaction; the transaction price must be available; and accounting data on the target must be available. I drop deals where the target or the acquirer are in the financial sector. Finally, I exclude deals for which the pre-deal or post-deal acquirer's q or target's q are at the top or bottom 1% of the distribution. I supplement this data with financial items from COMPUSTAT – fundamentals quarterly database to compute the pre-and post-merger acquirer's q.[49] The pre-merger q is computed at

[49] The reason I am using COMPUSTAT for the acquirer and SDC for the target financial information is the fact that a significant part of targets are private and therefore, this information is not available in COMPUSTAT.

the end of the fiscal quarter immediately before the announcement date. The post-merger q is computed at the end of the fiscal quarter immediately after the deal is complete. My final sample includes 3,351 deals.

To check that conglomerates are more acquisitive than standalones, I use COMPUSTAT-segments over 1988-2007 to identify multi-segment firms and standalones. I merge this firm panel with the Thompson Financial SDC Platinum database to evaluate the number and value of deals performed by conglomerates and standalones. This sample of deals includes completed transactions where more than 50% of the shares were owned by the acquirer post-deal. My final sample includes 79,224 firm-years and 15,876 M&A deals.

To study how M&A accounting affects the diversification discount I use the sample of firms included in the COMPUSTAT-segments data set over the 1988-2007 period. In addition, these firms must meet the following criteria: positive sales, no business segments in financial sector (SIC codes 6000 to 6999), agriculture (SIC code lower than 1000), government (SIC 9000) or other non-economic activities (SIC 8600 and 8800); unclassified services (SIC 8900) are excluded; firms for which the sum of business segments sales or assets deviate from the firm's total sales or assets by more than 5% are also excluded. Firms with missing segment SIC-codes are excluded.[50] The final sample consists of 79,224 firm-years.

3.3.2 Adjusting q, Deal Excess-value and Firm Excess-value

I adjust deal excess-value and firm excess-value measures in order to correct for the impact of M&A accounting.

Deal excess-value. I proxy for deal's excess-value using the logarithm of the ratio between the merged firm's q and the theoretical q of a portfolio that includes the target and the acquirer as standalones, as defined in section 2. q is defined as the ratio between the market value of assets and the book value of assets. The market value and book value of both target and acquirer as standalones are obtained before the merger's announcement date. Adjusted deal excess-value is defined in the same way, except for the book value of the merged firm, that I correct by subtracting the difference between the transaction price and the target's pre-merger book value. Adjusted deal excess-value is only computed when the purchase method is used.

Firm excess-value. I estimate firm excess-value using several specifications. Firm excess-value corresponds to the logarithm of the ratio between the firms' observed q and its imputed q, defined as the sales-weighted (or assets weighted) average the firm's business segments hypothetical q. The hypothetical q is the median (or average) q of standalones in the same industry-year. The industry match is done at the 4-digit SIC

[50] My results are robust to replacing the missing segments' SIC-codes with the main SIC code reported by the firm in order not to reduce the sample size of diversified firms.

code level when there are five or more standalones. Otherwise, it is done at the highest level where at least 5 standalones are available. The firm excess value - adjusted measure corresponds to the excess value measure where both observed and imputed q are corrected for goodwill. Goodwill is used as a proxy the difference between the transaction price and the pre-merger target's book value because this difference cannot be obtained from financial statements. Goodwill-adjusted q corresponds therefore to the ratio between the market value of assets and the book value of assets minus goodwill.

3.4 Empirical results

3.4.1 M&A Accounting and Tobin's q

Table 3.1 summarizes the data on completed deals, acquirer and target firms for both diversifying and non-diversifying acquisitions. The average deal is $776 million and corresponds to the acquisition of 93% of the target's equity. The average market value of the equity acquired is $710 million, meaning that the acquirer pays on average a premium of $65 million above the market value of the target. On average, the target's q (3.47) is higher than the acquirer's q pre-merger (2.42). However, despite merging on average with higher q firms, the acquirer's' q drops approximately 12% after the deal is complete. These two pieces of evidence together seem contradictory. On the one hand the acquirer pays a positive premium above the market value of the target which would be consistent with positive synergies arising from the merger. On the other hand the q of the merged firm is on average lower than both the acquirer and the target's pre-merger q.

Because in 86% of the deals the purchase method is applied, M&A accounting is a possible explanation for this effect. In addition, more than 95% of the acquirers have a pre-merger q higher than 1, what suggests that a significant proportion of acquirers experience a mechanical decrease in q when they merge, irrespective of the target's q. Thus, I adjust the acquirer's q post-merger to reflect the difference between the price paid for the target and its book value. Once q is corrected, the merged firm's q turns out to be on average higher and the pre-merger q increasing from 2.42 to 2.54.

I then focus in diversifying mergers to check if they show this same pattern. A negative impact from a diversifying merger after correcting for M&A accounting would be consistent with a diversification discount. I consider a deal to be diversifying if the primary 2-digits SIC code of the acquirer differs from that of the target. Diversifying deals represent 38% of the sample and the average diversifying deal has a value of $553 million. The same negative effect on q after merging is observed for diversifying deals despite targets having higher q than acquirer's. This is not the case, again, once I correct q for M&A accounting.

In 30% of the deals 100% of the transaction price is paid in stocks. For 100% cash payments the proportion of deals is 31%. In the case of stock-financed we can be sure that external financing is used. However, in the case of cash payments these might not correspond to internal funds. In fact a significant proportion might correspond to debt financed deals.

Table 3.2 shows the average Δq and deal excess-value, in particular for deals satisfying the conditions under which the purchase method and the pooling method imply conflicting effects on these variables.

With respect to Δq, the most frequent case is the one in which the acquirer has a q higher than 1 and merges with an higher q target. Under these conditions the purchase method implies a drop in q, but the pooling method an increase. Indeed, for deals using the purchase method the average pre-merger q is 1.96 and the post-merger q about 10% lower. For the deals satisfying the same conditions using the pooling method the q increases from 2.89 to 3.02. Once the post-merger q is corrected for the difference between transaction price and target's book value for the deals using the purchase method, it increases to 2.32. The case in which the pre-merger acquirer's q is lower than one but higher than the target's q implies a positive Δq under the purchase method and a negative Δq under the pooling. However, there are no observations under the pooling method satisfying these conditions.

This results suggest that firms choose not to use the pooling when they benefit from a mechanical increase in q while using the pooling. Remember that doing the opposite is more difficult to implement. Choosing the pooling instead of the purchase method implies that the deal must qualify for pooling and satisfy all the 12 criteria.

Under the purchase method, as predicted, we observe an average increase in q (from 0.95 to 1.10). When adjusting the post-merger q, Δq gets reduced, but post-merger q is still above pre-merger q. A possible explanation are synergies reflected on the market value of the merged firm.

I estimate deal excess-value as the log of the ratio between post-merger acquirer's q and the theoretical q of a portfolio including the acquirer and the target. Under the purchase method, whenever the ratio between transaction price and target's book value is higher than one this measure is under-estimated with respect to the pooling method. This is the most frequent situation and more than 95% of the deals in my sample satisfy this condition. For deals using the purchase method satisfying this condition the average deal excess-value is -0.307, which is significantly lower than -0.155, the average deal excess-value for deals under the same conditions using the pooling method. This is consistent with most of the deals showing an underestimated excess-value. Once we correct this measure for deals using the purchase method, it increases to 0.197. Now, this value is significantly above the average deal excess-value under the pooling method, suggesting that pooling M&As perform worse than those using the purchase method, once we correct the books and make them comparable.

For the whole sample of pooling and purchase I find an average negative deal excess-value (-0.288 for deals using the purchase and -0.154 for deals using the pooling). This result is not consistent with the M&A event studies' findings of positive cumulative abnormal returns when jointly looking at acquirer and target. However, once the books of the merged firm are adjusted these two measures become reconciled. The adjusted deal excess-value measure suggests that on average the merged firm has an higher q than the target and the acquirer together as standalones, which is consistent with positive joint cumulative abnormal returns after the merger is announced.

Table 3.3 shows the regression analysis for the impact on Δq of using the pooling versus the purchase method. The dependent variable in all regressions is the logarithm of the ratio between the merged firm's q and pre-deal acquirer's q. In regressions 2 and 4, q is adjusted for the difference between transaction price and target's pre-merger book value. As predicted, there is a significant negative impact on Δq from the acquirer's pre-merger q being higher than one, for deals using the purchase method. This negative effect is reduced once q is adjusted and inexistent in the pooling method sub-sample once additional controls are added. It seems to be the case that the purchase method is generating part of this negative effect. In fact, these findings confirm prediction 2, according to which the purchase method generates a mechanic drop in q whenever acquirer's q is higher than one.

According to prediction 1, under the purchase method, target's q is not expected to explain Δq. On the contrary, it should have a positive impact on Δq when the pooling method is used and once q is adjusted under the purchase method. The regression results when the pooling method and adjusted q are used are as predicted, except for regression 5 where the coefficient is positive but not statistically significant. When the purchase method is used and acquirer's q is not adjusted I still find an impact from target's q. Nevertheless, this impact is either smaller when compared to the same regressions using adjusted q or negative.

As an additional test, I add a diversification dummy as a control in these regression models to check if the average Δq is significantly different within the groups of diversifying and non-diversifying deals. I find no statistically significant impact from performing a diversifying deal on Δq. This finding helps to support my main hypothesis in two ways. First, it suggests that even if a diversification discount exists, at least, it is not being generated at the moment when the firm becomes diversified through an acquisition. Second it is consistent with the diversification discount beings explained by M&A accounting. In this particular framework, both diversifying and non-diversifying firms are performing acquisitions and are exposed to the effects of M&A accounting in exactelly the same way. If M&A accounting is indeed responsible for a mechanical drop in q, there is no reason for diversified acquisitions to be more affected than non-diversifying ones.

Table 3.4 reports regression results estimating the impact of deals characteristics on deal excess-value. The dependent variable is deal excess-value in regressions 1,

3, 5 and 6 and adjusted deal-excess-value in regressions 2 and 4. In order to test prediction 3 I include target's q and premium-to-assets ratio as independent variables. Prediction 3 implies that deal excess value under the purchase method is decreasing in the difference between the transaction price and the target's book value and increasing in synergies. To test this prediction, I split the difference between transaction price and target's book value in two measures: target's q and premium-to-assets. Because I have no proxy for synergies I assume they are a positive function of the premium paid above the target's market value. Thus, I expect unadjusted deal excess-value to be decreasing in both target's q and premium-to-assets as long as synergies are lower that the premium. Once deal excess value gets adjusted and for the pooling sub-sample of deals, I expect target's q to be neutral and premium-to-assets to have a positive effect as it is not inflating the books anymore and it is now just a proxy for the synergies.

Consistent with prediction 3, I find that the target's q has a negative impact on non-adjusted deal excess value under the purchase method. This negative impact is significantly reduced when excess-value is corrected for purchase accounting and not significant when the pooling method is used. The impact of premium-to-assets on non-adjusted excess value is not significantly different from zero. This is consistent with the negative effect of the premium itself being offset by the positive effect of the synergies that might being captured by this variable as well. Once the dependent variable gets adjusted, the premium is not expected to have a negative impact anymore and the effect turns to be positive and significant, suggesting that positive synergies are being generated by combining the two firms. The same happens for the pooling subsample, where the premium has a positive and significant coefficient. And indeed, under the pooling method, excess value, is expected to depend positively and exclusively on the value of the synergies.

By including a diversification dummy in these regression models I test for a significantly different deal excess-value across diversifying and non-diversifying deals. This is in fact a clean and direct test for the diversification discount, in the sense that my benchmark are the two merging companies as standalones before the deal, and not an industry matched portfolio. If diversification destroys value, then deal excess-value should be negative, on average, for diversifying deals. I do not find this to be true: once I adjust for M&A accounting average deal excess value is +0.067 for diversifying deals. Moreover, I do not find a significant different deal excess-value for non-diversifying deals: the coefficient of the diversification dummy in these regressions in negative but not statistically significantly different from zero.

3.4.2 Diversified Firm vs. Standalones

Descriptive statistics for the panel of diversified and standalone firms are reported in Table 3.5. Conglomerates represent as much as 8% of the sample and they are

on average bigger, have lower q, higher profitability and significantly lower capital expenditures. Consistent with the previous literature, diversified firms have negative excess-value between -0.05 and -0.46, depending on the variable specification. There is a significant difference from using the standalones industry average or median while estimating this measure, suggesting that extreme positive values of q occur for standalones. Using business segments' assets or sales as a weight to computed imputed q shows similar results. Once corrected for goodwill, diversified firms' discount is reduced to values between -0.03 and -0.43. In the full sample, however, there is no significant difference between q and goodwill adjusted q.

Regarding M&A activity, conglomerates perform a slightly higher number of deals. These deals are also higher in value when compared to standalones. The average deal by a conglomerate has a transaction value of $173 million, while the full sample average is $112 million. This is also reflected in the fact that, on average, goodwill represents 7% of the assets for conglomerates but less than 5% for standalones.

3.4.3 Do Conglomerates Acquire More?

There are several reasons to believe that diversified firms acquire and have acquired more in the past than standalones. On the one hand, one of the reasons for being a conglomerate in the first place is probably the fact that the firm acquired one or more unrelated business in the past. In this case, being a conglomerate is just a consequence of past unrelated acquisitions. On the other hand, conglomerates are known to be on average bigger, older and less financially constrained than standalones (Bodnaruk, Massa and Zhang 2009) and therefore to have more conditions to perform more and bigger acquisitions. My argument rests on the premise that diversified firms are more acquisitive than standalones and hence I test this hypothesis.

Table 3.6 shows the results of regressing a diversification dummy on the number of past acquisitions performed by a given firm. The sample is a panel of 79,224 firm/years from COMPUSTAT segments. The dependent variable is the total number of past deals made by a firm until a given year. The number of deals is obtained from SDC-Platinum. I rely on SDC reporting all deals performed by firms in Compustat segments. If not, on the assumption that the deals not reported are random and not sistematically related to conglomerates or standalones. From the descriptive statistics, however, we know already that conglomerates have higher goodwill-to-assets ratio, suggesting that they do in fact perform more and bigger acquisitions than standalones.

I find a positive and significant correlation between being diversified and past M&A activity. The univariate tests show a positive correlation of 30% that increases to 41% once firm fixed effects are added. Adding firm size, q and profitability as controls reduces the size of the diversification dummy coefficient, However, I am not trying to establish a causal link between diversification and acquisitions, but only to show

that diversified firms are more acquisitive than standalones irrespective of part of this correlation being due to size, for instance.

Together with the descriptive statistics, these results suggest that diversified firms have been involved in more deals than standalones. This is consistent with conglomerates growing and/or becoming diversified by acquisitions. In this sense, they are more exposed to the effects of M&A accounting.

3.4.4 The Goodwill-adjusted Discount

Table 3.7 replicates the standard diversification discount regressions for the period: 1988 to 2007 and adjusts this procedure for the impact of M&A accounting. The dependent variable in regression 1 is q. The dependent variable in regressions 3, 5, 7 and 9 is firm excess-value using different specifications. Regressions 2, 4, 6, 8 and 10 use the same specifications variables as regressions 1, 3, 5, 7 and 9 respectively, but corrected for goodwill.

Using non-adjusted q and firm excess-value as dependent variable I replicate the standard diversification discount finding. I estimate the non-adjusted diversification discount to be between 0.04 and 0.11. These values are on average lower than the ones in Berger and Ofek (1995), who find a diversification discount of 0.12. However, their sample is restricted to the period 1986-1991. Bevelander (2002) finds a 0.08 discount using an extended sample: 1980-1998.

Once the dependent variable is corrected for goodwill, the diversification discount gets significantly reduced. When using q as dependent variable this correction is 14%. When firm-excess value is used, this reduction is between 34% and 51% and for two of the four specifications I do not find the diversification discount to be statistically significant anymore, suggesting that a significant proportion of it is explained by goodwill and due to M&A accounting.

Moreover, this is a conservative adjustment to q. Goodwill is only part of the difference between transaction price and target's book value before the acquisition. Assuming no heterogeneity across diversified firms and standalones with respect to the proportion of goodwill in the total difference between transaction price and target's book value, this total difference is also expected to be bigger for conglomerates and the total correction would imply a greater reduction in the diversification discount.

The main implication of this finding is in terms of the average diversification discount. The discount gets significantly reduced after correcting for M&A accounting suggesting eventually a diversification premium once q is fully adjusted. This result is consistent with Villalonga (2004b) who finds a diversification premium using an alternative firm segments data set to COMPUSTAT and helps to reconcile the previous observed discount with Schoar(2002) who finds that diversified firms can be more productive than stand alone firms, but still finds a discount when using stock market data.

3.4.5 The Change in M&A Accounting and the Diversification Discount

Since 2001, all firms doing mergers and acquisitions have to apply the purchase method of business combinations. This implies that more firms than in the past are affected by the mechanical drop in q. Indeed, firms that under the past regulation could have used the pooling method, now have to use the purchase method. and conglomerates are expected to be more exposed to this change and thus this should be reflected in terms of firm-excess value.

Table 3.8 reports the regression results of the impact of the new accounting rule on the diversification discount as typically measured. The dependent variable is q in regression 1 and firm excess-value in the remaining regressions. The dependent variables are not adjusted for goodwill.

The coefficient of interest corresponds to the interaction term between the diversification dummy and post-2001 dummy. The estimated values for this coefficient suggest an additional diversification discount post-2001 between 0.02 and 0.08. Although this coefficient is negative in all specifications, it is not significant in 2 out of the 5 specifications.

These findings suggest that the introduction of the accounting rule in 2001 creates a spurious additional diversification discount in the post-2001 period.

3.4.6 High vs. Low Goodwill Industries

If the diversification discount is explained by the fact that acquirers capitalise the premium paid above the target's book value in their balance sheet, then in industries where lower or no premium is paid, one should observe lower no diversification discount as typically measured. I test the hypothesis that diversified firms in high goodwill industries have a higher diversification discount. The regression results are shown in table 3.9. The dependent variables are not adjusted for goodwill.

To define the high and low goodwill industries, I rank the 1-digit SIC code industries according to its average goodwill-to-assets ratio. The top goodwill industry corresponds to Health, Social, Legal, Education, Management and Accounting services (SIC codes 8000-8999) and the bottom one to Mining and construction (SIC codes 1000-1999). In the top goodwill industry goodwill represents 17% of the assets' book value. In the bottom goodwill industry this ratio is only 3%. I define a high goodwill dummy to be one if the 1-digit SIC code of the firm's core-business is 8, and zero otherwise.

I find that firms in the top goodwill industry have a diversification discount that is higher than the average, and I find no significant diversification discount for firms in the bottom goodwill industry. Diversified firms in the top goodwill industries show a statistically significant diversification discount that ranges between 0.17 and 0.24 (this is given by the sum of the diversification dummy coefficient and the interaction

term between diversification dummy and high goodwill dummy). The diversification discount for the low goodwill industry is given by the coefficient of the diversification dummy, that is not statistically different from zero in any of the regressions.

These results are consistent with my rationale for diversification discount. In low goodwill industries diversified firms are not penalized from recognizing their assets at the transaction price while standalones do not, because the difference between transaction price and book value is small. On the contrary, high goodwill firms show a higher than the average diversification discount. For instance, in specifications 4 and 5, the diversification discount is higher than 0.2, while the average diversification discount in the full sample, using the same specification is about 0.05.

3.4.7 Differences-in-differences Estimator

So far we learned that the change in accounting rule in 2001 drives an extra diversification discount in the post 2001 period, and also that firms in high goodwill industries are more exposed to the accounting artefact generated by using the purchase method. In this subsection I link these two pieces of evidence to test if the diversification discount is in fact explained by M&A accounting using a triple differences and a differences-in-differences estimator. The 2001 change in accounting rule is a proper exogenous event to firms that is expected to affect mostly firms in the high goodwill industries. Therefore, diversified firms in the top goodwill industry correspond to the treatment group and the ones in the low goodwill industry to the control group. Table 3.10 reports these findings.

Regressions 1, and 3 to 6 correspond to the triple-differences tests. Regressions 2 and 7 to 10 correspond to the pure differences-in-differences test. The dependent variables are q and firm excess-value non-adjusted for goodwill.

In the triple-differences test, the main explanatory variable of interest is the triple interaction term: high goodwill*post-2001*diversification dummy. In all specifications of firm excess-value, the coefficient of this variable is negative and significant, implying an additional discount for diversified firms, in the top goodwill industry, after the change in accounting rule. Using q, this coefficient is still negative but not statistically significant. The firm excess-value regressions suggest a post-2001, high goodwill, diversification discount between 0.3 and 0.5. The coefficients of the remaining dummy variables are mostly not significant across the different specifications.

I do a similar test using pure differences-in-differences, where I restrict the sample to diversified firms. The findings support the previous evidence. The coefficient of interest in this case is just the interaction term between the high goodwill dummy (the treatment group) and the post-2001 dummy, because all firms included in the sample are diversified. The coefficient on the interaction term is negative and significant for all specifications, except for one. The magnitude of the post 2001- high goodwill discount ranges between 0.30 and 0.47.

This evidence is consistent with M&A accounting explaining the diversification discount. By linking the time series event with the cross sectional heterogeneity helps to reject other possible effects post-2001 that could be driving the discount, and other possible differences between high and low goodwill firms that could also be driving the previous results. One concern regarding the previous interpretation would be the case in which firms in high goodwill industries would change their M&A policy because of the change in accounting rules. But in that scenario, we would expect them to engage in less M&A not to suffer from the accounting artefact, what would be contradicting to what I find. The other possibility would be firms in high goodwill industries start engaging in particularly value destroying diversification strategies after 2001 when compared to low goodwill firms. Since there is no apparent reason for this to occur, the change in M&A accounting seems to be responsible for these findings.

3.5 Robustness and Discussion

3.5.1 Correcting for the Total Difference Between Transaction Price and Taget's Book Value

Table 3.11 shows 20 deals from SDC platinum dataset that coincide with the acquirer reporting to become diversified for the first time in COMPUSTAT Segments dataset and for which the accounting method applied is reported to be the purchase method.[51] For this small sample of firms I am able to identify exactly the difference between the transaction price and the target's book value and also the goodwill recognized by the acquirer in its books. I find that the total premium paid in excess of book value is approximately 3 times the book value of the target and that goodwill represents 58% of this premium.

I also check the impact on acquirer's q of these first diversifying acquisitions. The average q for this small sample of acquirers before the merger is 2.34 and drops to 1.72 after the deal. Then, I adjust the post-merger q for the total difference between the transaction price and the target's book value and find no decrease in q. In fact, the average adjusted q is 2.67, which is significantly higher than the q before the acquisition. This finding is consistent with the ones already reported for the full sample of M&A deals.

At this stage, knowing the weight of goodwill in the total difference between the transaction price and the book value of the target, I can estimate an adjustment to q that is closest to the full one and not bounded by goodwill. Table 3.12 shows these results.

The total difference between transaction price and target's book value is estimated to be 1.72*Goodwill. All specifications in table 3.12 correspond to adjusted measures

[51] The size of this sample is consistent with Graham, Lemmon and Wolf (2002) who find only 57 companies performing acquisitions and reporting a segment increase, during the period 1980 to 1995.

of q and excess-value based on this assumption. Specifications 1 and 3 to 6 are OLS regressions while specifications 2 and 7 to 10 are firm fixed effects regressions. The results with q and without firm fixed effects still show a significant diversification discount. However, once I control for firm fixed effects I find a significant diversification premium. The excess value regressions suggest either a zero or small diversification premium. Regressions 7 and 8 show a statistically significant diversification premium around 0.03. Although this evidence is not very strong nor robust in favour of a diversification premium, it suggests that correcting for the full impact of M&A accounting helps to reject the hypothesis of a diversification discount.

3.5.2 Market-to-sales Discount

Although the main performance variable used to measure the diversification discount in the literature is q, Berger and Ofek (1995) and others have used alternative measures. The market-to-sales is particularly relevant in this framework, because it is immune to the M&A accounting artefact described in this paper. And in fact, if we replicate the main regression model with market-to-sales and excess market-to-sales we still observe a negative and significant coefficient for the diversification dummy. Table 3.13 reports these results. A market-to-sales discount is, however, consistent with the conglomerates being at a latter stage of the firm life cycle, by opposition to standalones that tend to be younger firms. As younger firms, the standalones have higher growth opportunities, but also lower sales and therefore this ratio tends to be quite small for them. This explanation is consistent with the evidence in Bevelander (2002) who finds that age can explain half of the diversification discount measured with q.

To address this issue, I test if the observed diversification discount in terms of market-to-sales is generated at the moment of a diversifying acquisition. I repeat the tests reported in tables 3.3 and 3.4, using market-to-sales instead of q. Table 3.14 reports these results. I find no negative impact of diversification on market-to-sales either by looking at deal excess market-to-sales or by looking at Δ market-to-sales. In the deal excess market-to-sales regressions the diversification dummy coefficient is even positive, although not statistically significant.

These results can coexists with the fact that diversified firms have lower market-to-sales. What they show is that this discount is not created at the moment of diversification, at least for firms that diversify via acquisition. These results are also consistent with the ones previously shown for deal excess-value and Δq.

3.6 Conclusion

This paper shows that the diversification discount measured with Tobin's q can be explained by M&A accounting. Most frequently, the purchase method creates a mechanical drop in acquirer's q once the deal is completed. This happens because the premium paid above the target's book value is capitalized in the balance sheet of the acquirer and inflates the post-merger book value of assets. Because diversified firms are more acquisitive than standalones, their q tends to be lower generating a spurious diversification discount.

My argument rests in two main premises and I provide evidence on those. First, using M&A deals data, I show that q drops on average after a deal is complete and that this effect is generated by the purchase method of M&A accounting. I also show that this effect is reversed once q is corrected for the difference between the transaction price and the book value of the target. Then, I show that conglomerates are more likely to have been acquirers in the past than stand alone firms.

I suggest a simple correction to q to adjust for this bias, that consists in computing q using the book value of assets minus goodwill in the denominator. I replicate the standard regressions in the diversification discount literature adjusting q for goodwill and I find the average diversification discount to be significantly smaller (abour 40% lower). For some excess-value specifications the diversification discount is not statistically different from zero. These results help to reconcile the results in Schoar (2002), who finds a diversification premium using plant productivity data, but a discount when using market data.

This correction has implications not only for the average diversification discount but also for its time series and cross sectional properties. I find that the traditional excess value approach suggests an additional diversification discount post-2001, when the purchase method is compulsory for all firms. In the cross section, I find an higher than average diversification discount in the top goodwill industry and no significant discount in the bottom goodwill industry. These findings are consistent with the diversification discount being generated by M&A accounting and more severe for firms that acquirer with higher premium over the target's book value.

I then link the evidence on the time series and cross section in a differences-in-differences approach. I estimate the impact of the exogenous change in the accounting rules in 2001 using the top goodwill industry as my treatment group and the bottom goodwill industry as my control group. I find evidence of an extra diversification discount in the period after the change in the accounting rule for firms in the treatment group.

Finally, because the goodwill adjustment is a conservative correction I estimate the magnitude of the full difference between transaction price and book value and its impact on the average diversification discount. I find a diversification premium in some of the excess value specifications.

This papers contributes to the corporate diversification literature with additional evidence on the average diversification discount and also on its time series and cross sectional characteristics. It suggests a methodological correction to account for the impact of M&A accounting in excess value.

Future research may explore the impact of M&A accounting on other cross sectional and time-series properties of the diversification discount. For instance, the diversification discount time series might be affected by the proportion of firms that used the pooling method vs the pooling method before 2001. On the cross section, the diversification discount is known to be more severe for conglomerates with more dispersed *qs*, but these may as well be biased due to M&A accounting.

3.7 Tables

Table 3.1: Summary Statistics - Deals

The sample corresponds to deals for which financial information is available for both the target and the bidder during the period 1984 to 2007. Accounting variables are from the most recent available quarterly report before the deal, except for post-merger q, which is from the first quarterly report available after the deal is complete. q is defined as the ratio between the market value of assets and the book value of assets. The market value of assets is defined as the book value of assets less the book value of equity plus the market value of equity. q adjusted is the ratio between the market value of assets and adjusted book value of assets. Adjusted book value of assets is assets minus the difference between the transaction price and target's book value before the deal. Total difference is the difference between the transaction price and the book value of acquired net assets. Target's q is the ratio between market value and book value of target's assets before the deal. Transaction premium is the difference between transaction price and market value of acquired equity. Purchase method dummy is one if the acquirer uses the purchase method and zero if it uses the pooling of interests. Diversifying acquisition dummy is one if the primary 2-digits SIC code of the acquirer is different from the one of the target. Stock payment dummy is one if 100% of the transaction is paid in stocks. Cash payment dummy is one if 100% of the transaction price is paid in cash. N is the number of non-missing observations.

	Mean	Median	Std. Dev.	Min	Max	N
	Panel A - Full sample					
Pre-deal Acquirer's q	2.41	1.84	1.75	0.79	15.98	3,349
Post-deal Acquirer's q	2.13	1.65	1.41	0.81	10.45	3,349
Post-deal Acquirer's q Adjusted	2.54	1.90	1.88	0.58	16.34	3,349
Deal Excess-value	-0.27	-0.11	1.07	-12.93	6.59	3,349
Deal Excess-value Adjusted	0.14	0.04	1.33	-11.35	13.84	3,349
Target's q	3.47	2.14	4.28	0.65	43.47	3,349
Total assets - Target ($MM)	505.83	74.37	2,066.03	0.06	56,553.00	3,349
Net assets - Target ($MM)	191.17	31.60	837.15	-994.19	23,534.00	3,349
Total Equity Market Value - Target ($MM)	770.36	118.27	3,443.35	0.05	89,165.59	3,349
Percentage of shares acquired	92.50	100.00	20.63	0.37	100.00	3,349
Market value of shares acquired	711.84	102.00	3,373.44	0.05	89,165.59	3,349
Transaction Value ($MM)	777.01	112.20	3,513.48	0.05	89,167.72	3,349
Total difference ($MM)	606.17	72.74	2,949.75	-496.48	84,069.42	3,349
Transaction premium ($MM)	65.17	0.00	378.94	-3,188.50	9,999.97	3,349
Purchase method dummy	0.86	1.00	0.35	0.00	1.00	3,349
Diversifying acquisition dummy	0.38	0.00	0.48	0.00	1.00	3,349
Stock payment dummy	0.30	0.00	0.46	0.00	1.00	3,349
Cash payment dummy	0.31	0.00	0.46	0.00	1.00	3,349
	Panel B - Diversifying acquisitions					
Pre-deal Acquirer's q	2.35	1.80	1.70	0.80	14.17	1,258
Post-deal Acquirer's q	2.07	1.61	1.32	0.81	10.45	1,258
Post-deal Acquirer's q Adjusted	2.39	1.84	1.64	0.81	13.01	1,258
Deal Excess-value	-0.25	-0.10	1.06	-11.64	6.59	1,258
Deal Excess-value Adjusted	0.07	0.01	1.24	-11.35	9.67	1,258
Target's q	3.48	2.14	4.48	0.66	43.47	1,258
Total assets - Target ($MM)	350.22	63.27	1,290.50	0.07	31,248.00	1,258
Net assets - Target ($MM)	145.94	26.34	653.47	-581.74	18,775.00	1,258
Total Equity Market Value - Target ($MM)	573.41	100.26	2,351.45	0.05	54,906.81	1,258
Percentage of shares acquired	92.86	100.00	20.07	2.19	100.00	1,258
Market value of shares acquired	515.04	87.92	2,132.55	0.05	54,906.81	1,258
Transaction Value ($MM)	552.57	94.94	2,180.39	0.05	54,906.81	1,258
Total difference ($MM)	431.63	62.37	1,913.04	-305.54	52,070.81	1,258
Transaction premium ($MM)	37.53	0.00	218.39	-1,055.62	5,000.00	1,258
Purchase method dummy	0.87	1.00	0.33	0.00	1.00	1,258
Stock payment dummy	0.29	0.00	0.46	0.00	1.00	1,258
Cash payment dummy	0.34	0.00	0.47	0.00	1.00	1,258

Table 3.2: Purchase vs. Pooling: q and Deal excess-value

This table shows the average pre and post-merger acquirer's q and deal excess value for all deals and under the conditions which the pooling and the purchase method imply conflicting results. q is defined as the ratio between the market value of assets and the book value of assets. q-adjusted is the ratio between market value of assets and adjusted book value of assets where adjusted book value of assets is assets minus the difference between the transaction price and the target's book value. Deal excess-value is the log of the ratio between post-merger acquirer's q and the theoretical q of a portfolio including the acquirer and the target. Adjusted deal excess-value is calculated using post-merger adjusted q. Pre-merger data is from the quarterly report immediately before the deal is announced. Post-merger data is from the quarterly report immediately after the deal is completed. $\frac{M_T+P}{B_T}$ is the ratio between the transaction price and the target's book value. N is the number of non missing observations.

	Purchase Method				Pooling Method		
	pre-merger q	post-merger q	post-merger q adj.	N	pre-merger q	post-merger q	N
$q_T < q_A < 1$	0.95	1.10	1.09	18	-	-	-
$q_T > q_A > 1$	1.96	1.78	2.32	1,636	2.89	3.02	300
All deals	2.25	1.95	2.42	2,864	3.36	3.18	485

	Deal Excess Value				
	non-adjusted	adjusted	N	non-adjusted	N
$\frac{M_T+P}{B_T} < 1$	0.095	0.030	140	0.440	1
$\frac{M_T+P}{B_T} > 1$	-0.307	0.197	2,722	-0.155	484
All deals	-0.288	0.189	2,864	-0.154	485

Table 3.3: Purchase vs Pooling: Change in q Regressions

This table shows the impact of the purchase vs. the pooling method on the difference between post-merger q and pre-merger acquirer's q. The dependent variable is the log of the ratio between post-merger q and pre-merger acquirer's q. The adjusted difference is calculated using the post-deal acquirer's q adjusted for the difference between transaction price and the target's book value. Pre-merger data is from the quarterly report immediately before the deal is announced. Post-merger data is from the quarterly report immediately after the deal is completed. Models (1) to (4) include only deals where the purchase method was used. Models (5) and (6) include only deals where the pooling method was used. Acquirer's q>1 is a dummy equal to one if pre-merger acquirer's q is higher than 1. Transaction premium is the difference between the transaction price and the market value of the acquired equity. Diversifying acquisition dummy is one when the target and acquirer have different 2-digits SIC codes. Target's weight is the ratio of the transaction price to the book value of the acquirer after the deal. Cash (stock) payment dummy is one if 100% of the deal is paid with cash (stocks). Acquirer's size is the book value of the acquirer's assets pre-merger. Deal value corresponds to the transaction price. N is the number of non-missing observations.

	(1)	(2)	(3)	(4)	(5)	(6)
	Purchase				Pooling	
Acquirer's q >1 dummy	-0.242	-0.203	-0.134	-0.095	-0.108	0.039
	[-11.3]	[-6.10]	[-4.84]	[-2.03]	[-5.04]	[0.90]
Target's q	-0.009	0.005	0.007	0.020	0.006	0.011
	[-4.37]	[2.23]	[2.59]	[5.21]	[1.19]	[1.91]
Acquirer's q pre-merger			-0.090	-0.079		-0.062
			[-10.00]	[-7.68]		[-4.59]
Log Transaction premium			-0.001	-0.000		-0.003
			[-1.05]	[-0.38]		[-0.62]
Div. acquisition dummy			-0.015	-0.015		-0.033
			[-1.18]	[-0.90]		[-0.73]
Target's weight			-0.041	0.107		0.179
			[-2.07]	[0.91]		[2.69]
Cash payment dummy			0.021	-0.013		
			[1.40]	[-0.74]		
Stock payment dummy			0.020	0.028		0.028
			[0.89]	[0.97]		[0.50]
Log acquirer's size			0.043	-0.028		0.047
			[9.48]	[-2.44]		[2.34]
Log deal's value			-0.045	0.032		-0.031
			[-8.92]	[2.60]		[-1.37]
Constant	0.150	0.236	0.115	0.286	0.046	-0.141
	[7.06]	[7.15]	[3.32]	[4.40]	[3.62]	[-1.36]
Observations	2,867	2,867	1,537	1,537	484	254
R-squared	0.044	0.018	0.306	0.163	0.006	0.161
	Dependent variable specifications:					
Adjusted q	No	Yes	No	Yes	No	No

Table 3.4: Deal Excess-value regressions

This table shows the determinants of deal excess-value under the purchase and pooling methods. Deal excess-value is the difference between post-merger acquirer's log q and the theoretical log q of a portfolio including the acquirer and the target. Adjusted deal excess-value is calculated using post-merger adjusted q. Pre-merger data is from the quarterly report immediately before the deal is announced. Post-merger data is from the quarterly report immediately after the deal is completed. Target q is the ratio between the market value and the book value of target's assets pre-merger. Premium-to-assets is the ratio between transaction premium and the post-merger book value of merged firm's assets. Transaction premium is the difference between transaction price and market value of acquired net assets before the deal. Diversifying acquisition dummy is one when the target and acquirer have different 2-digits SIC codes. Target's weight is the ratio of the transaction price to the book value of the acquirer after the deal. Cash (stock) payment dummy is one if 100% of the deal is paid with cash (stocks). Acquirer's size is the book value of the acquirer's assets pre-merger. Deal value corresponds to the transaction price. N is the number of non-missing observations.

	(1)	(2)	(3)	(4)	(5)	(6)
	Purchase				Pooling	
Target's q	-0.017	-0.003	-0.016	-0.004	-0.002	-0.002
	[-7.30]	[-1.50]	[-7.23]	[-2.14]	[-0.50]	[-0.35]
Premium-to-assets	-0.006	0.018	0.003	0.013	0.028	0.028
	[-0.63]	[4.59]	[0.43]	[3.28]	[1.98]	[2.03]
Div. acquisition dummy			-0.017	-0.017		-0.024
			[-1.62]	[-1.49]		[-0.76]
Target's weight			-0.023	0.229		0.007
			[-0.78]	[1.62]		[0.16]
Cash payment dummy			0.014	-0.021		
			[1.36]	[-1.95]		
Stock payment dummy			-0.020	-0.027		-0.016
			[-1.19]	[-1.46]		[-0.59]
Log acquirer's size			0.047	-0.010		0.031
			[11.7]	[-0.82]		[1.94]
Log deal's value			-0.056	0.004		-0.032
			[-12.6]	[0.35]		[-1.97]
Constant	-0.064	0.056	-0.117	0.081	-0.042	-0.060
	[-8.29]	[7.46]	[-5.41]	[1.59]	[-1.96]	[-0.89]
Observations	2867	2867	2831	2831	484	481
R-squared	0.058	0.004	0.159	0.071	0.003	0.020
	Dependent variable specifications:					
Adjusted q	No	Yes	No	Yes	No	No

Table 3.5: Summary Statistics - Firms

This table shows descriptive statistics for diversified and standalone firms between 1988 and 2007. q is defined as the ratio between the market value of assets and the book value of assets, being the market value of assets defined as the book value of assets less the book value of equity plus the market value of equity. q Gw adjusted is the ratio between market value of assets and adjusted book value of assets. Adjusted book value of assets is assets minus goodwill. Goodwill-to-assets is the ratio of goodwill to total assets. Ebit-to-sales is the ratio of Ebit (earnings before interest and taxes) to net sales. Capex-to-sales is the ratio of capital expenditures to net sales. Diversification dummy is one when the firm reports more than one business segment. Number of segments is the number of business segments reported by the firm. Number of deals is the number of past M&A deals by the firm. Transaction value is the value of the deal. Firm excess-value corresponds to the logarithm of the ratio between the firms' q and its imputed q. Imputed q is defined as the sales-weighted (assets-weighted) average of firm's business segments hypothetical q. The hypothetical q is the industry median (average) q of standalones in the same industry/year. The 4-digit SIC code is used in this match whenever there are five or more standalones in the industry. If there are less than five standalones the next SIC code level is used, and so forth. The firm excess-value – Gw adjusted measure corresponds to the firm excess-value measure where q is adjusted for goodwill. N is the number of non-missing firm-year observations.

	Mean	Median	Std. Dev.	Min	Max	N
	Panel A - Full sample					
q	2.80	1.58	3.98	0.55	28.80	79,224
q - Gw adjusted	2.96	1.71	4.15	0.57	29.94	79,224
Goodwill-to-assets	0.05	0.00	0.11	-0.04	0.99	79,224
Total Assets (MM$)	734.29	63.90	3522.75	0.00	244192.50	79,224
Ebit-to-sales	-1.04	0.04	4.10	-24.17	0.40	79,224
Capex-to-sales	0.18	0.04	0.46	0.00	2.84	79,224
Diversification dummy	0.08	0.00	0.27	0.00	1.00	79,224
Number of segments	1.13	1.00	0.52	1.00	10.00	79,224
Number of deals	0.18	0.00	0.73	0.00	70.00	79,224
Transaction value ($MM)	111.53	7.00	561.48	0.00	27,861.29	9,652
	Panel B - Diversified firms					
q	1.79	1.31	1.98	0.55	28.80	6,107
q - Gw adjusted	1.96	1.43	2.13	0.57	29.94	6,107
Goodwill-to-assets	0.07	0.00	0.12	0.00	0.81	6,107
Total Assets (MM$)	1525.60	223.06	3799.34	0.02	59305.00	6,107
Ebit-to-sales	-0.09	0.07	1.39	-24.17	0.40	6,107
Capex-to-sales	0.05	0.01	0.20	0.00	2.84	6,107
Number of segments	2.66	2.00	0.96	2.00	10.00	6,107
Number of deals	0.19	0.00	0.81	0.00	22.00	6,107
Transaction value ($MM)	173.45	12.43	661.50	0.00	12,455.22	1,184
Excess value measures:						
Assets weight - Ind. median	-0.05	-0.08	0.52	-3.08	4.21	6,095
Assets weight - Ind. median - Gw adjusted	-0.03	-0.07	0.53	-2.95	4.20	6,095
Sales weight - Ind. median	-0.05	-0.08	0.52	-3.08	3.35	6,103
Sales weight - Ind. median - Gw adjusted	-0.03	-0.07	0.53	-2.95	3.38	6,103
Assets weight - Ind. average	-0.46	-0.42	0.61	-3.09	3.08	6,095
Assets weight - Ind. average - Gw adjusted	-0.43	-0.40	0.61	-3.00	3.06	6,095
Sales weight - Ind. average	-0.46	-0.42	0.62	-3.09	2.69	6,103
Sales weight - Ind. average - Gw adjusted	-0.43	-0.39	0.62	-3.00	2.67	6,103

Table 3.6: Past Deals Regressions

The sample includes diversified and standalones US publicly traded firms from 1988 to 2007. The dependent variable in all regressions is the past number of deals performed by a firm at a given date. Div. dummy is one if the firm reports more than one business segment. Log Assets-adjusted is the log of assets minus goodwill. Log q - Gw adjusted is the log of the ratio between market value of assets and book value of assets minus goodwill. T-stats are reported in brackets. Standard errors are clustered at firm level. N is the number of non-missing firm-year observations.

	(1)	(2)	(3)	(4)	(5)	(6)
	Number of Past Deals					
Div. dummy	0.288	0.407	-0.067	0.083	-0.045	0.087
	[4.56]	[5.24]	[-0.30]	[1.12]	[-0.20]	[1.19]
Log Assets			0.284	0.709	0.299	0.742
			[16.5]	[21.8]	[15.8]	[21.6]
Log q - Gw adjusted					0.245	0.197
					[9.21]	[8.89]
Ebit-to-sales					0.018	-0.008
					[10.1]	[-4.72]
Constant	0.872	0.863	-0.272	-2.037	-0.487	-2.320
	[93.2]	[144]	[-5.14]	[-15.2]	[-6.52]	[-15.4]
Observations	79,224	79,224	79,224	79,224	79,224	79,224
R-squared	0.001	0.002	0.050	0.090	0.054	0.094
Firm fixed effects	no	yes	no	yes	no	yes

Table 3.7: q and Firm Excess-value Regressions - Adjusting for Goodwill

The sample includes diversified and standalones US publicly traded firms from 1988 to 2007. Log q is the log of the ratio between the market value of assets and the book value of assets. Log q corrected for goodwill is the log of the ratio between market value of assets and book value of assets minus goodwill. Firm excess-value is the log of the ratio between q and imputed q. Imputed q is the segments' assets-weighted (sales-weighted) average q. Segment's q corresponds to the median (average) q of stand alones in the same 4-digits SIC industry. Excess-value corrected for goodwill is computed using goodwill adjusted q. Diversification dummy is one if the firm reports more than one business segment. Log Assets - adjusted is the log of assets minus goodwill. Capex-to-sales is capital expenditures divided by total sales. Ebit-to-sales is earnings before interest and taxes divided by sales. T-stats are reported in brackets. Standard errors are clustered at firm level. N is the number of non-missing firm-year observations.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Log *q*		Firm Excess-Value							
Div. Dummy	-0.112	-0.096	-0.037	-0.018	-0.039	-0.021	-0.054	-0.035	-0.056	-0.037
	[-8.04]	[-6.62]	[-2.74]	[-1.31]	[-2.92]	[-1.49]	[-3.68]	[-2.35]	[-3.82]	[-2.49]
Assets	-0.082		-0.054		-0.054		-0.031		-0.031	
	[-26.5]		[-18.6]		[-18.6]		[-10.1]		[-10.1]	
Assets-adjusted		-0.079		-0.050		-0.050		-0.027		-0.027
		[-25.6]		[-17.1]		[-17.1]		[-9.07]		[-9.10]
Ebit-to-sales	-0.049	-0.049	-0.033	-0.033	-0.033	-0.033	-0.032	-0.033	-0.032	-0.033
	[-33.2]	[-32.9]	[-20.0]	[-20.3]	[-20.0]	[-20.3]	[-20.9]	[-21.2]	[-21.0]	[-21.2]
Capx-to-sales	-0.063	-0.089	-0.026	-0.035	-0.026	-0.035	-0.050	-0.067	-0.050	-0.067
	[-6.66]	[-9.23]	[-2.77]	[-3.69]	[-2.77]	[-3.68]	[-5.27]	[-7.03]	[-5.29]	[-7.04]
Constant	0.710	0.729	0.274	0.248	0.274	0.248	-0.120	-0.131	-0.119	-0.130
	[47.2]	[48.7]	[19.1]	[17.4]	[19.1]	[17.4]	[-8.06]	[-8.89]	[-8.03]	[-8.85]
Observations	79224	79224	79212	79212	79220	79220	79212	79212	79220	79220
R-squared	0.196	0.194	0.087	0.080	0.088	0.080	0.093	0.086	0.094	0.087
	Dependent variable specifications:									
Industry average	-	-	no	no	no	no	yes	yes	yes	yes
Industry median	-	-	yes	yes	yes	yes	no	no	no	no
Assets weight	-	-	yes	yes	no	no	yes	yes	no	no
Sales weight	-	-	no	no	yes	yes	no	no	yes	yes
Goodwill correction	no	yes	no	yes	no	yes	no	yes	no	yes

Table 3.8: The Impact of the Change in Mergers and Acquisitions Accounting Rules on the Diversification Discount

The sample includes diversified and standalones US publicly traded firms from 1988 to 2007. Log q is the log of the ratio between the market value of assets and the book value of assets. Firm excess-value is the log of the ratio between q and imputed q. Imputed q is the segments' assets-weighted (sales-weighted) average q. Segment's q corresponds to the median (average) q of standalones in the same 4-digits SIC industry. Diversification dummy is one if the firm reports more than one business segment. Post-2001 Dummy is one if the year is 2001 or after. Capex-to-sales is capital expenditures divided by total sales. Ebit-to-sales is Earnings before interest and taxes divided by sales. T-stats are reported in brackets. Standard errors are clustered at firm level. N is the number of non-missing firm-year observations.

	(1)	(2)	(3)	(4)	(5)
	Log *q*	Firm Excess-value			
Div. Dummy	-0.091	-0.031	-0.026	-0.045	-0.037
	[-5.96]	[-2.12]	[-1.78]	[-2.92]	[-2.42]
Post-2001 Dummy	0.455	0.034	0.034	-0.202	-0.203
	[28.6]	[2.10]	[2.10]	[-11.6]	[-11.7]
Post-2001Div. Dummy	-0.078	-0.023	-0.049	-0.033	-0.069
	[-2.99]	[-0.86]	[-1.83]	[-1.10]	[-2.27]
Log Assets	-0.082	-0.054	-0.054	-0.031	-0.031
	[-26.5]	[-18.6]	[-18.6]	[-10.1]	[-10.1]
Log Assets-adjusted					
Ebit-to-sales	-0.049	-0.032	-0.032	-0.032	-0.032
	[-33.2]	[-20.0]	[-20.0]	[-20.9]	[-20.9]
Capx-to-sales	-0.063	-0.026	-0.026	-0.050	-0.050
	[-6.63]	[-2.76]	[-2.75]	[-5.26]	[-5.27]
Constant	0.708	0.273	0.273	-0.120	-0.121
	[47.1]	[19.1]	[19.0]	[-8.12]	[-8.15]
Observations	79,224	79,212	79,220	79,212	79,220
R-squared	0.196	0.087	0.088	0.093	0.094
	Dependent variable specifications:				
Industry average	-	no	no	yes	yes
Industry median	-	yes	yes	no	no
Assets weight	-	yes	no	yes	no
Sales weight	-	no	yes	no	yes

Table 3.9: q and Firm Excess-value Regressions - High vs. Low Goodwill Industries

The sample includes diversified and standalones US publicly traded firms from 1988 to 2007, in the top and bottom goodwill-to-assets industries (SIC 8 and SIC 1, respectively). Log q is the log of the ratio between the market value of assets and the book value of assets. Firm excess-value is the log of the ratio between q and imputed q. Imputed q is the segments' assets-weighted (sales-weighted) average q. Segment's q corresponds to the median (average) q of standalones in the same 4-digits SIC industry. Diversification dummy is one if the firm reports more than one business segment. High Gw is a dummy equal to one if the firm is in the top goodwill industry (SIC 8) and zero otherwise. Capex-to-sales is capital expenditures divided by total sales. Ebit-to-sales is Earnings before interest and taxes divided by sales. T-stats are reported in brackets. Standard errors are clustered at firm level. N is the number of non-missing firm-year observations.

	(1)	(2)	(3)	(4)	(5)
	Log *q*	Firm Excess-value			
Div. Dummy*High Gw	-0.166	-0.171	-0.151	-0.237	-0.216
	[-2.07]	[-2.10]	[-1.84]	[-2.76]	[-2.48]
Div Dummy	0.002	-0.018	-0.038	0.000	-0.010
	[0.046]	[-0.40]	[-0.85]	[0.0045]	[-0.19]
High Gw	0.241	-0.022	-0.022	0.094	0.094
	[7.48]	[-0.73]	[-0.72]	[2.94]	[2.94]
Log Assets	-0.073	-0.062	-0.061	-0.049	-0.049
	[-8.48]	[-7.54]	[-7.50]	[-6.05]	[-6.03]
Ebit-to-sales	-0.038	-0.030	-0.030	-0.029	-0.029
	[-8.74]	[-7.41]	[-7.42]	[-7.50]	[-7.51]
Capex-to-sales	0.014	-0.004	-0.003	-0.038	-0.038
	[0.81]	[-0.22]	[-0.18]	[-2.24]	[-2.23]
Constant	0.469	0.301	0.300	-0.114	-0.116
	[10.4]	[6.91]	[6.88]	[-2.53]	[-2.57]
Observations	9,734	9,734	9,734	9,734	9,734
R-squared	0.215	0.113	0.113	0.147	0.148
	Dependent variable specifications:				
Industry average	-	no	no	yes	yes
Industry median	-	yes	yes	no	no
Assets weight	-	yes	no	yes	no
Sales weight	-	no	yes	no	yes

Table 3.10: Differences-in-differences(-in-differences)

In specifications (1) and (3) to (6) the sample includes diversified firms and standalones from 1988 to 2007, in the top and bottom goodwill-to-assets industries (SIC 8 and SIC 1, respectively). In specifications (2) and (7) to (10) this sample is restricted to diversified firms. Log q is the log of the ratio between the market value of assets and the book value of assets. Firm excess-value is the log of the ratio between q and imputed q. Imputed q is the segments' assets-weighted (sales-weighted) average q. Segment's q corresponds to the median (average) q of standalones in the same 4-digits SIC industry. Diversification dummy is one if the firm reports more than one business segment. High Gw is a dummy equal to one if the firm is in the top goodwill industry (SIC 8) and zero otherwise. Post-2001 Dummy is one if the year is 2001 or after. Capex-to-sales is capital expenditures divided by total sales. Ebit-to-sales is Earnings before interest and taxes divided by sales. T-stats are reported in brackets. Standard errors are clustered at firm level. N is the number of non-missing firm-year observations.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Log *q*		Firm Excess-Value							
High Gw * Post 2001 * Div	-0.250		-0.436	-0.318	-0.532	-0.415				
	[-1.47]		[-2.38]	[-1.72]	[-2.69]	[-2.02]				
High Gw Post 2001	-0.036	-0.318	-0.004	-0.004	0.141	0.141	-0.473	-0.342	-0.411	-0.295
	[-0.72]	[-1.92]	[-0.092]	[-0.085]	[2.64]	[2.64]	[-2.50]	[-1.80]	[-2.01]	[-1.38]
High Gw Div. Dummy	-0.112		-0.077	-0.081	-0.118	-0.121				
	[-1.27]		[-0.87]	[-0.91]	[-1.28]	[-1.31]				
Post-2001 Div. Dummy	0.041		0.223	0.100	0.320	0.207				
	[0.35]		[1.71]	[0.80]	[2.21]	[1.47]				
Div. dummy	-0.005		-0.063	-0.059	-0.068	-0.055				
	[-0.13]		[-1.53]	[-1.39]	[-1.59]	[-1.22]				
High Gw dummy	0.250	0.149	-0.021	-0.021	0.058	0.058	-0.097	-0.092	-0.069	-0.067
	[7.66]	[1.71]	[-0.70]	[-0.68]	[1.85]	[1.85]	[-1.09]	[-1.02]	[-0.75]	[-0.71]
Post 2001 dummy	0.473	0.533	0.009	-0.002	-0.455	-0.465	0.458	0.382	-0.009	-0.014
	[8.98]	[2.49]	[0.17]	[-0.032]	[-8.10]	[-8.38]	[2.04]	[1.57]	[-0.033]	[-0.046]
Observations	9,734	602	9,734	9,734	9,734	9,734	602	602	602	602
R-squared	0.215	0.142	0.114	0.114	0.150	0.150	0.127	0.103	0.174	0.170
	Dependent variable specifications:									
Industry average	-		no	no	yes	yes	no	no	yes	yes
Industry median	-		yes	yes	no	no	yes	yes	no	no
Assets weight	-		yes	no	yes	no	yes	no	yes	no
Sales weight	-		no	yes	no	yes	no	yes	no	yes

Table 3.11: Diversifying Acquisitions - impact on q

The sample includes only deals that coincide with the acquirer reporting to become diversified for the first time, for which the accounting method is known and for which accounting information on the target is available. q is the ratio between the market value of assets and the book value of assets. q Adjusted is the ratio between market value of assets and book value of assets minus the difference between transaction price and target's book value. Total dif. is the difference between the transaction price and the book value of acquired net assets. Goodwill% is the proportion of goodwill in the total difference between transaction price and target's book value.

Acquirer	Target	Deal Value	Total Dif	Goodwill	Goodwill %	pre-merger q	post-merger q	post-merger adj. q
InPlay Technologies Inc	FinePoint Innovations Inc	5.50	5.59	0.88	0.16	5.21	3.81	8.09
Bronco Drilling Co Inc	Eagle Well Service Inc	20.92	16.52	2.63	0.16	1.18	0.98	1.01
Viewcast.com	Delta Computec Inc	3.60	5.78	1.04	0.18	2.21	2.04	8.30
Rimage Corp	Dunhill Software Services Inc	6.19	4.34	1.01	0.23	0.88	1.59	1.95
Heritage Entertainment Inc	Landmark Theatre Corp	6.00	6.63	1.80	0.27	0.73	0.84	0.98
R&B Falcon Corp	Cliffs Drilling Co	452.07	236.14	70.60	0.30	4.19	1.06	1.13
Cobra Electronics Corp	Performance Products Ltd	37.20	37.12	12.00	0.32	1.16	0.93	1.36
Western Refining Inc	Giant Industries Inc	1,134.85	650.49	299.55	0.46	2.30	1.25	1.53
X-Rite Inc	Pantone Inc	180.00	171.60	85.11	0.50	1.36	1.23	1.67
MDI Inc	FAS Construction Mgmt Inc	4.20	5.79	3.36	0.58	1.64	1.26	1.67
Youbet.com Inc	United Tote Co	34.20	25.46	15.24	0.60	6.48	1.96	2.58
Mohawk Industries Inc	Dal-Tile International Inc	2,023.89	1,756.39	1,170.31	0.67	1.38	1.50	2.93
US Xpress Enterprises Inc	PST Vans Inc	83.87	66.36	52.21	0.79	1.87	1.16	1.38
Bolt Technology Corp	Custom Products Corp	5.88	5.18	4.34	0.84	3.21	3.11	4.53
Jaco Electronics Inc	Nexus Custom Electronics Inc	1.60	0.54	0.46	0.84	1.09	1.01	1.02
Landstar System Inc	TLC Lines Inc	35.27	28.32	24.56	0.87	1.93	1.60	1.74
Global Technovations Inc	Onkyo America(Onkyo Corp)	40.00	34.19	31.44	0.92	2.91	1.32	2.66
MotivePower Industries Inc	Young Radiator Co	70.50	41.60	39.50	0.95	1.95	2.06	2.31
HealthWorld Corp	Colwood House Medical Pub	12.20	10.97	10.60	0.97	2.55	1.94	2.47
First Cash Financial Services	Auto Master	33.70	18.09	18.00	0.99	2.59	3.74	4.06
	Mean	209.58	156.35	92.23	0.58	2.34	1.72	2.67

Table 3.12: Estimating the Total Effect of Mergers and Acquisitions Accounting

The sample includes diversified and standalones US publicly traded firms from 1988 to 2007. Log q – Adjusted is the log of the ratio between market value of assets and book value of assets minus the estimated difference between transaction price and target's book value of assets. The total difference between transaction price and target's book value of assets is estimated to be 1.72*Goodwill. Firm excess-value-adjusted is computed using adjusted q. Diversification dummy is one if the firm reports more than one business segment. Log Assets – adjusted is the log of assets minus the estimated difference between market value and book value of the target. Capex-to-sales is capital expenditures divided by total sales. Ebit-to-sales is Earnings before interest and taxes divided by sales. T-stats are reported in brackets. Standard errors are clustered at firm level. N is the number of non-missing firm-year observations.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Log q-Adjusted		Firm Excess-Value-Adjusted							
Div. Dummy	-0.057	0.038	0.017	0.015	-0.003	-0.005	0.029	0.031	-0.005	-0.004
	[-3.42]	[2.22]	[1.10]	[0.94]	[-0.18]	[-0.29]	[1.68]	[1.79]	[-0.26]	[-0.18]
Assets-Adjusted	-0.100	-0.279	-0.060	-0.061	-0.035	-0.035	-0.235	-0.236	-0.213	-0.213
	[-27.8]	[-33.5]	[-19.6]	[-19.6]	[-11.0]	[-11.0]	[-36.1]	[-36.1]	[-33.0]	[-33.0]
Ebit-to-sales	-0.051	-0.008	-0.031	-0.031	-0.031	-0.031	-0.007	-0.007	-0.005	-0.005
	[-26.7]	[-4.17]	[-17.9]	[-17.9]	[-18.9]	[-18.9]	[-4.63]	[-4.56]	[-3.14]	[-3.13]
Capx-to-sales	-0.120	0.078	-0.038	-0.038	-0.077	-0.077	0.060	0.061	0.071	0.070
	[-10.4]	[6.61]	[-3.80]	[-3.80]	[-7.59]	[-7.61]	[5.80]	[5.87]	[6.56]	[6.54]
Constant	0.831		0.292	0.293	-0.128	-0.128				
	[49.5]		[19.4]	[19.4]	[-8.21]	[-8.16]				
Observations	78653	78653	78641	78649	78641	78649	78641	78649	78641	78649
R-squared	0.200	0.154	0.078	0.078	0.087	0.087	0.115	0.115	0.161	0.161
Firm fixed effects	no	yes	no	no	no	no	yes	yes	yes	yes
	Dependent variable specifications:									
Industry average	-	-	no	no	yes	yes	no	no	yes	yes
Industry median	-	-	yes	yes	no	no	yes	yes	no	no
Assets weight	-	-	yes	no	yes	no	yes	no	yes	no
Sales weight	-	-	no	yes	no	yes	no	yes	no	yes

Table 3.13: Market-to-sales and Firm excess-market-to-sales regressions

This table shows the determinants of firm market to sales and firm excess market-to-sales. Log market-to-sales is the market value of assets divided by net sales. Excess market-to-sales is the log of the ratio between market-to-sales and imputed market-to-sales. Imputed market-to-sales is the segments' sales-weighted average market-to-sales. Segment's market-to-sales corresponds to the median market-to-sales of standalones in the same 4-digits SIC industry. Diversification dummy is one if the firm reports more than one business segment. Capex-to-sales is capital expenditures divided by total sales. Ebit-to-sales is earnings before interest and taxes divided by sales.

	(1)	(2)	(3)	(4)
	Log Market-to-sales		Excess Market-to-sales	
Div. Dummy	-0.187	-0.139	-0.109	-0.126
	[-7.66]	[-6.74]	[-5.59]	[-5.20]
Assets	-0.014	0.044	0.010	0.029
	[-3.28]	[5.49]	[2.72]	[3.61]
Ebit-to-sales	-0.172	-0.123	-0.174	-0.153
	[-106]	[-58.6]	[-65.9]	[-60.5]
Capx-to-sales	0.740	0.349	0.466	0.448
	[49.7]	[22.5]	[29.2]	[25.2]
Constant	0.347	0.585	-0.064	0.085
	[16.1]	[19.2]	[-3.25]	[2.77]
Observations	79224	79224	79220	79220
R-squared	0.482	0.346	0.456	0.415
Firm fixed effects	no	yes	no	yes

Table 3.14: Deal Excess-market-to-sales and change in Market-to-sales regressions

This table shows the determinants of deal excess-market-to-sales and change in acquirer's market-to-sales. Deal excess-market-to-sales is the difference between log market-to-sales post-merger and the log market-to-sales of a portfolio including the acquirer and the target firm. Change in Market-to-sales is the ratio between post-merger log market-to-sales and pre-merger acquirer's log market-to-sales. Target q is the ratio between the market value and the book value of target's assets pre-merger. Premium-to-assets is the ratio between transaction premium and the post-merger book value of merged firm's assets. Transaction premium is the difference between transaction price and market value of acquired net assets before the deal. Diversifying acquisition dummy is one when the target and acquirer have different 2-digits SIC codes. Target's weight is the ratio of the transaction price to the book value of the acquirer after the deal. Cash (stock) payment dummy is one if 100% of the deal is paid with cash (stocks). Acquirer's size is the book value of the acquirer's assets pre-merger. Deal value corresponds to the transaction price. N is the number of non-missing observations.

	(1)	(2)	(3)	(4)	(5)	(6)
	Deal Excess Market-to-sales			Δ Market-to-sales		
Div. acquisition dummy	0.008	0.007	0.009	-0.007	-0.011	-0.010
	[0.40]	[0.37]	[0.49]	[-0.43]	[-0.58]	[-0.55]
Target's weight	0.040	0.041	0.084	0.050	0.046	0.058
	[1.18]	[1.20]	[2.19]	[1.16]	[1.02]	[1.17]
Cash payment dummy	-0.028	-0.036	-0.041	-0.016	-0.013	-0.015
	[-1.37]	[-1.74]	[-2.00]	[-0.92]	[-0.70]	[-0.77]
Stock payment dummy	-0.094	-0.089	-0.062	0.023	0.021	0.029
	[-3.78]	[-3.61]	[-2.61]	[1.05]	[0.88]	[1.21]
Log acquirer's size	-0.158	-0.158	-0.156	-0.010	-0.009	-0.009
	[-23.7]	[-23.5]	[-22.8]	[-1.33]	[-1.18]	[-1.09]
Log deal's value	0.099	0.101	0.102	0.033	0.026	0.027
	[13.2]	[13.3]	[13.3]	[4.73]	[3.37]	[3.29]
Target's market-to-sales		-0.002	-0.001		-0.000	0.000
		[-4.00]	[-3.24]		[-0.58]	[0.016]
Premium-to-assets		-0.024	-0.049		0.002	-0.005
		[-2.00]	[-2.54]		[0.18]	[-0.34]
Target's q			-0.027			-0.007
			[-8.12]			[-2.50]
Constant	1.025	1.030	1.089	-0.071	-0.041	-0.024
	[24.2]	[24.5]	[26.1]	[-1.82]	[-0.97]	[-0.57]
Observations	2,851	2,851	2,851	3,279	2,844	2,844
R-squared	0.236	0.249	0.289	0.020	0.012	0.016

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