Core-business expertise and value destroying conglomerates.*

Cláudia Custódio†

FMG-London School of Economics and ISCTE Business School - Lisbon

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Abstract

I test the hypothesis that diversification away from the core-business destroys value because managers' expertise is core-specific. Moreover, this lack of managerial expertise outside the core is likely to be higher for unrelated industries. In a first step, I test two main implications of this theory: 1) firms with more business activities outside the core business should have lower value; 2) this loss should be higher for firms with secondary businesses that are less related to the core-business. I develop diversification measures that capture both the importance of non-core business segments and the unrelatedness with the core-business. The core-business is defined as the segment with the highest sales. The unrelatedness is measured using the SIC-codes. In a second step I test more directly if the results are caused by lack of managerial expertise outside the core by using an industry index of managerial discretion. I find that increasing non-core business sales-weight in 1% decreases firm value up to 7.4% if the business segment 4-digits away from the core. If this segment is also in a high managerial discretion industries the value loss is 11%.

Keywords: Corporate diversification; Diversification discount; Core-business; Managerial expertise; Indutry-specific human capital.

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†R409, FMG - LSE, Houghton Street London, WC2A 2AE; phone: 020 7955 6890; email: c.p.custodio@lse.ac.uk

1 Introduction

I test the intuitive idea that diversification destroys value due to a lack of managerial expertise. More specifically I assume that managerial expertise is higher in the company's core business than in its secondary business segments. As a result, firms are likely to do well in their core-business but underperform focused firms in their non-sore business segments and therefore, conglomerates should exhibit value discounts[1]. I find empirical support of these hypotheses.

I use a panel of diversified and focused US firms from 1984 to 2005. First, I test two implications: compared to focused firms, firms with more business activity outside the core business should have lower value and performance; moreover, these effects should be larger for firms with more business activity in unrelated-to-core secondary businesses. The first implication is tested using a sales-shift measure that captures the importance of non-core activities in the company. Since it is extremely difficult to measure manager's allocation of attention and considering that sales are in general the main output of firms' operations, the proportion of sales outside the core business is used as a proxy for managerial attention away from the core. The core business is defined as the segment with the highest sales. The second implication is tested using a distance-to-core variable that captures both the importance of secondary business segments and the unrelatedness between them and the core-business of the company. The importance of each business segment is captured by its sales weight and the unrelatedness by a distance-to-core measure defined using the SIC-code structure in its full extension (4 digits). According to this measure the secondary segments can be defined as being one, two, three or four digits away from the core, by comparing how many left digits of the SIC they share (for example, the ones that share only the first digit will be three digits away while the ones that share the first three digits will be one digit away). I find that increasing non-core business sales-weight in 1% decreases firm value in 5.5% and that if this

[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, i.e. that diversified firms are traded with a discount when compared to an equivalent portfolio of stand alone firms.

increase occurs in a business segment 4-digits away from the core, the value loss increases to 7.4%. This effect still holds after controlling for the fact that the firm is diversified and for the scope of diversification.

Then, I use an industry index of managerial discretion created by Hambrick and Abrahamson's (1995) to relate these findings to the lack of managerial expertise outside the core-business. This index of managerial discretion classifies the industries according to its dependence on the managers' actions. Companies operating in industries where firm performance highly depends on managers' actions should suffer more from lack of industry-specific expertise. Therefore, if managerial expertise is core-specific, conglomerates with secondary segments in industries characterized by high managerial discretion should perform worse than conglomerates diversifying towards low managerial discretion industries. As predicted, the results show that companies with secondary segments in high managerial discretion industries experience a more severe discount. Increasing non-core business sales in 1%, when the periphery performance highly depends on the managers' actions decreases the value of the company in 8%. When those sales occur in high discretion industries that are 3 digits away or more from the core-business this loss increases to 11%. No evidence is found that companies diversifying towards low discretion industries destroy value.

I also document some time-series properties of diversification. Along with a decrease in the proportion of diversified firms in the economy, I find a trend of firm focusing around the core business, especially after 1997. I also find a decreasing effect of distance-to-core on firm value in recent years. This finding is consistent with evidence that the relative importance of firm-specific human capital is decreasing when compared to general managerial ability transferable across companies and industries (Murphy and Zábojník, 2007 and Fridman, 2005).

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 (2007). 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 (2007) 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, 2007) 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.

The paper proceeds as follows: section 2 discusses some theoretical predictions. Section 3 presents, summarizes the data and describes the diversification measures and control variables in detail. Empirical tests are presented in section 4, robustness issues in section 5 and finally section 6 concludes.

2 Theoretical predictions

2.1 Free cash flow theory

The main reason for why diversification may destroy value is the presence of agency conflicts. In fact, diversification is viewed as a manifestation of such agency costs. However, the alternative to diversification in the presence of entrenched managers in control of free cash flow – i.e. cash in excess of what can be profitably re-invested in the firm – could be even worse. It is easy to find circumstances when investing in the core activity could offer an even lower rate of return (as in declining industries). But, there is sense in which diversification should on average be a less profitable way to spend free cash flow. As Jensen (1986) points out, diversification to unrelated industries are a source of value destruction due to the lack of managerial expertise outside their core business. Therefore, according to the free cash flow theory, it is expected a negative impact of diversification, in particular towards unrelated industries.

2.2 Internal capital markets theory

The efficient capital markets hypothesis that was first presented by Stein (1997) argues that headquarters do a better job that outside institutions (external markets) in picking good projects and therefore relax credit constraints. A related argument is presented by Inderst and Muller (2003) that diversification adds value due to centralized borrowing: headquarters can use the liquidity generated by good projects to buy continuation rights for low cash flow (but positive NPV) projects that would not survive the external market discipline. The theories of efficient internal capital markets predict a positive effect of diversification that should be captured by the number of business segments in the firm. The source of diversification value in this type of models corresponds exactly to having diversity in available projects. In the case of Stein (1997) the greater the number of segments, the more likely are the headquarters to incur in winner picking and to have a comparative advantage when

compared to stand alone firms accessing external markets. In the same way Inderst and Muller (2003) predict a positive effect for scope, since it's more likely for the pooling of cash flows to happen in a comparatively more efficient way if more distinct projects are around.

According to Scharfstein and Stein (2000) internal capital markets are inefficient when compared to external ones because of a "socialist effect": good divisions end up subsidizing inefficient ones because managers assume an equalitarian but inefficient way of sharing resources. Again, the greater the number of segments, the higher is the probability of having good and bad divisions in the firm creating in this particular framework a source of inefficiencies.

3 Sample description and variable construction

The sample consists of a panel of 99,805 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).

3.1 Empirical hypothesis and Diversification measures

In this paper I test the following hypothesis: diversification activities destroy value because managers have industry-specific expertise[2], underperforming in business segments that are unrelated to the core business of the firm.

This hypothesis relies on the assumption that managers have industry-specific human capital to the core business of the firm, meaning that, with respect to this core business, they perform as well an average manager of a stand alone firm in the same industry. Once diversifying towards a different business segment, they will perform worse than the average manager of a stand alone company in that industry. Therefore, and ignoring other possible effects of diversification, the value of a diversified company should be lower than a portfolio of stand-alone companies in the same industries because the diversified firm will be destroying value, at least, in the periphery. Although I assume managers do have the necessary skills to do well in the core business, the lack of expertise in the periphery may have side effects on the core performance as well. This can be the case, if managers need to allocate proportionally more time to secondary segments to reduce the comparative disadvantage and thus neglect the core business.

This effect of "defocus" from core is captured 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 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 present lower value. Going a step further, the more unrelated (or distant) these secondary segments are from the core, the greater the underperformance in those segments is likely to be. Different industries require different specific-skills from managers and this dissimilarity should be stronger for more unrelated industries. The distance-to-core measure aims to capture this effect, by assigning higher

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

values of distance-to-core to companies with the most unrelated-to-core periphery. The second implication of my hypothesis is therefore, that firms with more unrelated-to-the-core businesses destroy more value than diversified firms with a related periphery.

Finally, I test in a more direct way the argument that it is lack of managerial expertise that drives the previous implications. I use an industry index of managerial discretion to classify the core business and the periphery according to its sensitivity to managerial performance. Firms operating in industries where the role of the manager is very important, should suffer more from the lack of expertise of managers in those industries. Thus, conglomerates with secondary business segments that highly depend on managerial performance are likely to perform worse. In a similar way, companies for which the core business is highly dependent on the manager should suffer more from increasing non-core activities, since managers will probably neglect the core business, having the need to run a business where they are relatively less skilled.

3.1.1 Sales-shift and Distance to the 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, distance-to-core and distance-to-core level 1,2,3 and 4. In this primary setting the core business is defined using the company main SIC code assigned by COMPUSTAT (dnum). COMPUSTAT defines the main industry of the company as the one with the highest proportion of sales.

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

The distance-to-core is a variable that can assume values between 0 and 4 and has two components. The first component is the level of "unrelatedness" between the secondary segments' industries and the central industry designated by distance to core. This distance

is defined based on the SIC code structure. The SIC code is a 4-digit code that allows the assessment of how related/unrelated these industries are by comparing its codes. The more left hand side digits of the SIC code the industries share, the more related they are. The second component captures the relative importance of each of the secondary segments using its sales.

Distance-to-core, is defined as:

$$D = \sum_i W_i d\left(c, i\right) \tag{1}$$

where W_i is the proportion of segment i sales in firm's total sales and $d\left(c, i\right)$ is the distance between segment's industry and core business' industry. $d\left(c, i\right)$ 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.

The last measures correspond to the split the previous one in four different levels creating 4 new variables. Because Distance-to-core gives ad-hoc values (1,2,3,4) to the distance between the core business and the secondary segments (what influences the order of magnitude of the measure), the new measure corrects this limitation by imposing no specific number (or weight) to the distances, and simply considering the sales proportion of segments that are 1,2,3 or 4 digits away from the core.

Distance-to-core level n, with $n \in \{1, 2, 3, 4\}$ - is the proportion of segments' sales in total sales, for segments that are n digits away from the core business.

3.1.2 Other diversification measures

In order to control for other diversification effects rather than the lack of managerial expertise outside the core, I will use additional diversification measures: a diversification dummy and the number of business segments.

The *diversification dummy* is a variable set to one if the firm reports two or more business segments and zero otherwise. This variable captures the impact of the decision to become diversified and returns the average difference in value between a diversified and a stand alone firm.

The *number of segments* is equal to the number of business segments reported by the company and available at COMPUSTAT segment data file. The objective of including the number of segments in the model is to take into account both scope effects and internal capital markets effects, since the gains (losses) due to a more (less) efficient internal capital market should be greater (lower) for a greater (lower) number of segments.

3.2 Descriptive statistics and correlations

Table 1 shows the descriptive statistics for the full sample of firms and the sub-samples of diversified and stand alone, for the period 1984 to 2005. Diversified firms constitute about 25% of the full sample. On average, and when compared to stand alone firms, the diversified firm is bigger, hold relatively more liquid assets with respect to assets, has a lower level of capital expenditures to assets, and shows a higher profitability, here measured by EBIT (Earnings before interest and taxes) to sales.

The summary statistics for the sub-sample of diversified firms allow to do some characterization of the diversification activity. It documents that on average diversified firms have a total of 3 business segments, thus, 2 secondary segments, which contribute, on average, with 55% of total sales. Disaggregating this value, 15% of the sales occur in segments that are just one digit away from the core business, 12% in segments 2-digits away, 11% in seg-

ments 3-digits away and finally, the highest proportion, 17% in segments that are 4-digits away from the centre. The distance-to-core variable assumes an average value of 1.41 and varies between 0 and 4. The fact that we have companies in the sample for which this variable assumes its maximum possible value (meaning that all sales are made outside the core business) has two possible reasons. The first one is the criterion in use to classify the core business. By using the main SIC code reported by COMPUSTAT it can be the case that the historical core business is not the actual core business any more, simply because the company ended that business or because it sold it and the database was not updated. It can also be the case that COMPUSTAT reported wrong the main SIC code of the firm or of one of the business segments.

The correlations between Tobin's Q and independent variables are shown in Table 2. Results are again reported for both the full sample and the sub-sample of diversified firms. Diversification variables are highly correlated in the full sample, but simply because, by definition, they necessarily assume the same value in 75% of the sample: for stand alone firms, when the Diversification dummy assumes the value zero, the Number of segments is always one, Sales-shift is zero and Distance-to-core is also zero. Diversified firms' correlation matrix shows that the number of segments is not very correlated with Sales shift (11%), nor with Distance-to-core (14%).

3.3 Alternatives measures to Sales-shift and Distance-to-core

There is a set of traditionally used diversification measures that could be pointed out as alternatives to my measure of distance-from–the-core: the Herfindahl index, the number of related/unrelated segments and the sub-set of Entropy measures (total, related and unrelated)[3]. However, there are two crucial differences that distance-to-core in particular presents

[3]The Herfindahl index of diversification is defined as $H = \sum_i P_i^2$ and Total entropy is $E_T = \sum_i P_i^2 \ln(1/P_i)$ where P_i is he proportion of a firm's assets in industry i. Both measures are computed at a 4-digit SIC level. Unrelated entropy (E_U) is defined in the same manner as Total entropy, but computed at a 2-digit SIC level. Related entropy is $E_R = E_T - E_U$. The number of related (unrelated) segments is defined as the number of segments that share (do not share) the same 2-digit SIC code.

when compared to these measures that makes it more suitable to test the imlications for the presented hypothesis. First, it makes the distinction between the core business and the secondary segments. Secondly, it uses the SIC code in it's full extension (4-digits), using all the information available to classify the business segments

The best candidate to be an alternative to distance-to-core is Fan and Lang (2000) complementarity coefficient.[4]. These authors develop a diversification measure that also makes the distinction between the core business and secondary segments, accounting for the relatedness between each pair of industries. They employ commodity flow data from input-output (IO) tables to capture inter-industry complementarity and create a inter-segment relatedness variable that does not rely on the SIC code structure. The main difference of this measure to my distance-to-core measure is that it does not capture the relative importance of the core business and secondary segments in the firm's activities. It only uses the distinction between the core business and the periphery to measure the relatedness between them and not to define the level of sales that is shifted away from the core. This is ignored because when weighting the relatedness factor using the importance of each secondary segment they do it with respect to total secondary segments sales instead of the total sales of the firm. This is key in this paper since I want to capture the importance with respect to the firm of the segments were the manager is likely to underperform.

The correlations between alternatives measures of diversification are presented in table 3, showing that sales-shift and distance-to-core are in fact measuring something that is not captured by the other diversification variables. For instance, the correlation between distance-to-core and unrelated entropy, the conceptualy closest variable, is 33% for sales-shift

[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 jth secondary segment 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.

and 51% for the distance-to-core (considering the diversified firms sub-sample). Regarding the Fan and Lang (2000) measure, the correlation is even lower (in absolute terms): –19% for sales-shift and -28% for distance-to-core. These correlations are negative because Fan and Lang complementarity coefficient is measuring how focused is the firm while sales-shift and distance-to-core are measuring the opposite.

3.4 Distance-to-core across time

Figure 1 shows a downward trend in the average distance-to-core across time. Both graphs show average distance-to-core per year and in both samples it can be seen that firms are becoming more and more focused in its core business, or in near segments. For the full sample of firms this trend looks stronger, since it includes not only the core-focusing effect, but also the evolution of diversification itself, which is decreasing. Considering only the sub-sample of diversified firms, this trend is much softer, in particular before 1997. After that, it is evident that diversified firms are becoming more focused. Although not reported, the trend of sales-shift, that captures only the proportion of sales outside the core-business, is very similar to the one obtained for distance-to-core. Figure 2 presents the average distance-to-core for the four different levels, per year. The global trend observed for total distance-to-core is clearly driven by the 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. In fact, sales proportion for the closest segments is slightly increasing during the 90's.

4 The impact of Sales-shift and Distance-to-core on firm value

To test the impact of sales-shift and distance-to-core on firm market valuation I run fixed effects regression of diversification variables on Tobin's q. 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. In practice, this is in a measure of market valuation standardized by the book value of assets, used as a proxy for the value of the firm. In the past, and following the work of Lang and Stulz (1994) and Berger and Ofek (1995), the literature on corporate diversification has been using a measure of excess value based on Tobin's q to address the issue of the diversification discount/premium. However, the construction of the excess value variable consists in comparing the firms' true Tobin's q with an imputed q that is assigned to the firm based on its segments' SIC codes. If I was to use excess value as a dependent variable and Distance-to-core as a independent variable the results could be influenced by some mechanical effect caused by the fact that both the measures are constructed on the bases of the SIC code structure. By using fixed effects and by including year dummies in all models I expect to capture unobserved heterogeneity among firms and control for business cycle effects that may impact firm valuation.

The coefficients from the regression of sales-shift on firm value are presented in Table 4. All models include additional financial variables that are known to impact market valuation of the firm 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, leverage defined by debt to assets ratio and cash holdings to total assets.

All the models reported in this table show a negative and significant effect of sales-shift on firm's market value. This result is valid both for the full sample and the sub-sample of diversified firms, and when controlling for additional measures of diversification such as the diversification dummy and the number of segments. When sales-weight outside the core business increases one percent, the firm value decreases up to 6%, when analysing the full sample and up to 4% when analysing the sub-sample of diversified firms. This negative effect of sales-shift suggests that on top of the negative impact of the decision to become diversified the market is also discounting the fact that the company gets away from its primary business.

This result is consistent with the previously documented diversification discount but also with Schoar (2002)'s "new toy effect". Schoar (2002) show 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.

As shown Table 4, the overall impact of diversification is negative in all models and is given by the coefficients of sales-shift, diversification dummy and number of segments. But by using these three diversification measures together I'm able to identify and disentangle different effects of the decision to diversify, namely, a positive effect driven by the number of business segments. Once we control for the decision to diversify, by using the diversification dummy, the sales-shift variable, or by restricting the sample to diversified variables, the number of segments shows a positive and significant effect on firm value. A plausible interpretation for the positive correlation between the number of segments and the market value in diversified firms could be the fact that companies with more business segments could take more advantage from internal capital markets benefits. This result is, in this sense, consistent with the efficient internal capital markets hypothesis suggested by Stein (1997) and Inderst and Muller (2003). The diversification dummy loses its significance once we consider the effect of sales-shift in the full sample regressions, suggesting that sales-shift does a good job as a diversification measure per se.

Table 5 shows the results using the distance-to-core measure instead of sales-shift in the regression models. These results support the previous findings. When using the distance-to-core, i.e., using a variable that assumes a greater value for diversification activity occurring in businesses further away from the core, we observe a similar discount on market valuation as before. On average, companies that operate in segments that are distant from the primary business have less value than stand alone firms, or than companies that, being diversified,

have segments in related industries. This result is true for both the full sample of firms, controlling for the number of segments and for the decision to diversify and for the sub-sample of diversified firms. Again we observe a positive effect from the number of segments from what we might infer that as long as the companies do not shift operations too far from the core business, diversification is not necessarily destroying value.

Table 6 presents the same models as in table 5 using the split measure of distance-to-core i.e. using the proportion of sales in secondary segments that are 1,2,3 and 4 digits away from the core-business. In the full sample of firms, all different levels of distance-to-core present a negative and significant coefficient. These coefficients increase monotonically from level one to level three, decreasing slightly from level three to level four. Only level one and three coefficients, and level one and four, are statistically different from each other. The results suggest that increasing 1% of the sales-weight of segments that are at least 3 digits away from the centre decrease firm value in about 7%. Again, this result is consistent with the previous ones obtained with distance-to-core and sales-shift. The results in the sub-sample of diversified firms are not as strong as the ones in the full sample, possibly because the number of observations is much smaller. Even though, they do not contradict the previous findings. The coefficient's for level one and two of distance-to-core are not statistically different from zero, but distance-to-core level three and four present a negative significant value. This result suggests that three is the relevant level beyond which the company should not diversify. For 1% a percentage increase in sales-shift at these levels a decrease in firm value between 5% and 6% is expected. The additional diversification variables present similar results as before.

The results presented so far, showing a negative impact of sales-shift and distance to core on the market value of the firm do not contradict the hypothesis being tested that managers have lack of expertise outside the core-business, underperforming in those industries, and that this problem is more severe for conglomerates with business segments more unrelated-to-core.

4.1 Diversifying from/towards industries with different levels of managerial discretion

So far I provided evidence that outside the core activities destroy firm value. In this section I go a step further and check if this result changes for different values of managerial discretion, testing now if it is the lack of managerial expertise that is driving the previous results. If the conglomerate discount is caused by underperformance outside the core-business because managers are not experts in those industries, then conglomerates diversifying towards industries with low managerial discretion, where the managers' performance is less critical, should observe no, or at least a less negative impact from diversification. In a similar way, companies that operate primarily in industries with low managerial discretion, should also present a lower effect from shifting managers' attention to a different business. Therefore, sales-shift and distance-to-core should have less impact on firm value if the company is diversifying from or towards industries with low managerial discretion.

In order to test this hypothesis, I split my sample of firms according to the level of managerial discretion of its core industry and the average score of the periphery, following Adams, Almeida and Ferreira (2005). They use Hambrick and Abrahamson's (1995)[5] industry discretion ratings for seventy four-digits SIC code industries to classify the industries in their sample into high-discretion and low-discretion industries. An industry with low score of managerial discretion, for example, is natural gas transmission, by opposition to medical laboratories, which present a much higher score. In order to minimize missing values for firms which SIC codes are not covered by this ratting they average the discretion score at the 2-digit SIC level, procedure that I also follow.

The results from splitting the sample according to the level of managerial discretion are shown in table 7. When I split the sample according to the periphery's discretion score the

[5]Hambrick and Abrahamson (1995) use a panel of academic experts to classify seventeen selected industries according to its level of managerial discretion, and then check this rating with a set of observable characteristics that are linked to managerial discretion Then they use the coefficients from a regression of the ratings on these characteristics to extrapolate a classification to 53 additional industries.

results show that firms with secondary segments in high discretion industries suffer more from diversification than the ones with secondary segments in low discretion industries. In fact, sales-shift and distance-to-core show a significant negative effect on value only in the case when secondary segments industries have a high level of managerial discretion. The desegregated measure is significant for levels 3 and 4 of high discretion sub-sample and only significant at level 3 in the low discretion case. These results are consistent with the prediction that the lack of managerial expertise should be critical in business segments that are more sensitive to the managers' performance.

When I split the sample according to the level of discretion of the core business, the evidence is that only firms with its core business in high managerial discretion industries suffer from the shift in managers' attention towards secondary businesses. In fact, sales-shift and distance-to-core coefficients are only significantly different from zero in the sub-sample of firms with high managerial discretion core. Firms that have its primary business ranked as low managerial discretion show no impact from sales-shift away from the centre. Moreover, once we use the different levels of distance-to-core, low managerial discretion firms even show an increase in value for sales-shift that are only one digit away from the core business.

These results support the argument that diversification destroys value because managers need different skills to run different industries, being experts in the core business of the firm, and underperforming while running unrelated secondary segments.

4.2 Distance-to-core: Two periods analysis

Table 8 presents the results from splitting the sample in two different periods. The overall results are not contradicting the previous full sample analysis, despite some relevant changes occurring in the two periods. Regarding the sales-shift measure, the overall results obtained in the full sample were being driven mainly from the first period of data, since only for 1984-1994 period this variable is statistically significant. Considering now the distance effect between the centre and the periphery, even though the coefficients are less significant in eco-

nomic terms in the more recent period, most of the variables are still statistically significant. Distance-to-core losses statistical significance only in the sub-sample of diversified firms in 1995-2005 period. Considering the four distance-to-core levels, in the more recent period, the only significant coefficient corresponds to the most unrelated level of diversification for the full sample of firms, suggesting that only very unrelated diversification is now destroying value. This particular result is consistent with the predictions and evidence of Murphy and Zabojnik (2007) and Friedman (2005) who say that the increase in executive compensation is explained by an increase in the relative importance of general managerial skills as opposed to firm and industry-specific expertise. They support this explanation not just with the increase in CEO's pay, but also with evidence that firms are hiring more CEO's from outside the firm (especially those with previous CEO's experience) and with the increase in the number of CEO's with MBA education.

When looking at the diversification dummy and total number of segments interesting results are observed. The number of segments changes from a negative to a positive coefficient from the first to the second period, occurring exactly the inverse with the diversification dummy, that changes from a positive coefficient in the yearly period to a negative one in the recent years. Despite this change in coefficients, the overall net impact of diversification seams to be negative across periods.

4.3 The impact of Distance-to-core on performance - ROA

So far I provide evidence for a discount in market valuation for companies that shift its operations away from the core business. However, 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. Having this in mind, I will test the effect of the different measures of sales-shift and distance-to-core on firm past operational performance, as measured by Return on Assets (ROA). I'm defining

ROA as the ratio between EBITA (Earnings before interest taxes and amortizations) and total assets.

The results of the regressions using ROA as dependent variable are reported in Table 9. The results are similar to Tobin's q models with respect to the full sample and the sub-sample of diversified firms for sales-shift and agregated distance-to-core. Companies increasing their sales weight outside the core by one percent might expect a decrease in ROA up to 4%.

The results for the different levels of distance-to-core obtained in the full sample are consistent with the previous ones for Tobin's q, but in the diversified firms sub-sample, however, I don't find statistically significant different coefficients for the different levels of distance-to-core. Still, the coefficients increase monotonically for the 4 levels of distance between the core business and the segments.

Just as in some models for Tobin's q, the diversification dummy has no explanatory power when entering together with distance-to-core variables in the regressions. Contrary to the previous results, the number of segments has a negative significant coefficient in all the models.

5 Robustness tests

5.1 Using alternative definition of core business

The distance-to-core measures presented so far use the primary SIC code attributed to the company by COMPUSTAT to define core business. This SIC code is assigned to a firm by COMPUSTAT using the SIC code of the segment with the maximum sales. However, it might be the case that: first, the company primary industry is misclassified by COMPUSTAT or second, that the core business of the company changes and COMPUSTAT does not update this information. To test if my results are not driven or influenced by these effects, I will use an alternative definition for core business in order to construct my distance-to-core variables. For each firm-year the core business will now be defined as the SIC code of the segment with

the maximum sales.

Table 10 report the results of the regressions using distance-to-core measures constructed using this alternative definition of core business. The results are not substantially different nor contradict the ones obtained using the primary SIC assigned by COMPUSTAT. Sales-shift and distance-to-core present a negative significant coefficient in both panels. Using the four levels of distance-to-core I still find a significant difference between segments that are one or two digits away from the core, from segments 3 or 4 digits away. The magnitude of the coefficients is slightly higher, suggesting that increasing sales proportion outside the core might reduce firm value in up to 9%. Moreover, in the subsample of diversified firms the results suggest that if this increase occurs in segments 3 digits away this loss increases to 16%.

5.2 Using alternative unrelatedness measure

I repeat the previous tests using an alternative measure of diversification developed by Fan and Lang (2000) that also considers how related the periphery is to the core business. Similarly to my distance-to-core measures, Fan and Lang (2000) consider the existence of a primary and secondary businesses in the firm although using an alternative way to measure the relatedness between them. Relatedness is measured here using commodity flow data from input-output (IO) tables and used to construct a inter-segment relatedness variable that I will use as an alternative to distance-to-core.

Table 11 shows the results of using the pure Fan and Lang (2000) measure, as defined in section 3.1.2., in the models previously estimated[6]. The coefficients for the unadjusted measure of inter-segments complementarity although not statistically significant present an unexpected negative signal. The main differences to their original model is the dependent variable, since they use the excess value measure by Berger and Ofek (1995). I also use a set of additional controls in addition to firm size and number of segments and include firm

[6] 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.

fixed effects.

The most relevant difference between my set of measures and this input/output based measure is not the way of measuring relatedness itself, but the weights assigned to the secondary segments. By assigning these weights with respect to the total of secondary segments sales and not the total sales of the firm, they simply ignore the sales-shift effect, or the relative weight of the core business of the firm. Therefore, I will adjust their measure to incorporate this effect, simply by changing the weights of secondary segments in their measure. Also, since their measure is a measure of "relatedness" and not "unrelatedness", I use the inverse of their measure with two purposes. The first one is to make it comparable to my distance-to-core measure and the second is to 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.

When using the adjusted Fan & Land measure for the sales shifting effect, the variable becomes statistically significant and presents the expected negative sign in the full sample, corroborating previous results and arguments.

5.3 Using alternative estimation methods

So far all the models are estimated using fixed effect regressions. In this section I redo the estimation of the main models using alternative techniques. Table 12 present the coefficients estimated using a pooled OLS regression. All regressions include year dummies to take into account eventual macro economic factors that may influence firm value and some models include industry dummies as well to capture fixed effects within industries. These industry dummies are defined at a 2-digit SIC level. Standard errors in these regressions are both corrected for heteroskedasticity and clustered at the firm level. Using pooled OLS estimation, I find no contradiction with previous findings. All the coefficients of distance-to-core measures are negative and statistically significant as in the previous models. No contradictory differences are noticed in the other diversification variables as well.

In Table 13 a second estimation technique, median regression, is used in order to alleviate the effect of sample outliers. Now the dependent variable in the regressions is Tobin's q and not the log of Tobin's q, since the extreme values of this ratio will now be ignored. Again, year dummies are used in all estimations and industry effects, as previously defined, in some of the models. The full sample results are very similar to the ones obtained using fixed effect regressions in what concerns to sales-shift measure, distance-to-core and the number of segments. However, the diversified firms' results are not very robust in what concerns to the number of segments. In most of the previous specifications this variable presents a positive significant coefficient, but in this one, most of the models return a no effect or a negative value for the number of segments.

Nevertheless, the argument that managerial skills play a role in explaining the diversification discount remains robust to these alternative estimation techniques.

6 Conclusion

With this paper I test an aditional and at same time very intuitive explanation for the diversification discount based on managerial expertise. I develop a diversification measure of distance-to-core that considers both the proportion of sales outside the core-business and the distance between the centre and the periphery of the firm. I find evidence consistent with the explanation that if managers diversify towards business segments that are unrelated to the core-business they will have limitied ability to run these new businesses, underperforming stand alone firms in the same industries and, consequentely, destroying firm value. This result is strengthened by the fact that sales-shift and distance to core are only relevant if the company is diversifying from or towards industries where the managers have an high latitude of action. The results are robust to different estimation methods, alternative definitions of the variable of interest and two different measures of corporate performance.

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Table 1: **Summary of financial variables and diversification variables**

Table 1 presents the descriptive statistics for the full sample, and for the sub samples of stand alone and diversified US-based publicly traded firms. The full sample consists of 99,805 firm-years of data during the period 1984 to 2005. The financial data is from Compustat Industrial Annual and diversification data is from Compustat Segments. The diversification dummy is a variable set to one if a firm reports more than one business segment and zero otherwise. The number of segments is the number of business segments reported by the firm. Sales-shift is the percentage of business segments' sales that do not correspond to the core business of the firm with respect to total sales of the firm. The core business of the firm is defined by the primary SIC code imputed to each firm by Compustat (dnum). Distance-to-core is $D = \sum_i W_i d(c,i)$ where W_i is the proportion of segment i sales in firm sales and $d(c,i)$ is the distance between segment's industry and core business' industry. The distance 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. 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. Cash-to-assets is the ratio of cash and cash equivalents to total assets. N is the number of non missing observations.

	Mean	Median	St. Dev.	Min.	Max.	N
	Full sample					
Diversification dummy	0.25	0	0.43	0	1	99,805
Number of segments	1.47	1	0.99	1	10	99,805
Sales-shift	0.14	0	0.31	0	1	99,802
Distance-to-core	0.36	0	0.84	0	4	99,805
Tobin's Q	2.10	1.44	1.92	0.55	16.70	99,805
Size (mn $)	1,024.70	73.51	4,948.29	0.01	244,192.50	99,805
Sales (mn $)	925.89	76.43	4,417.70	0.004	306,731.00	99,805
Ebit-to-sales	-0.29	0.05	1.52	-20.04	0.38	99,805
Capex-to-sales	0.11	0.04	0.24	0	2.62	99,805
Leverage	0.59	0.52	0.60	0	16.04	99,805
Cash-to-assets	0.17	0.08	0.21	0	1	99,793
	Panel A: Stand alone firms					
Tobin's Q	2.23	1.51	2.04	0.55	16.70	74,663
Size (mn $)	620.50	54.34	3,422.77	0.01	244,192.50	74,663
Sales (mn $)	582.48	54.58	3,352.62	0.004	195,805.00	74,663
Ebit-to-sales	-0.37	0.04	1.69	-20.04	0.38	74,663
Capex-to-sales	0.12	0.04	0.25	0	2.62	74,663
Leverage	0.59	0.50	0.65	0	16.04	74,663
Cash-to-assets	0.19	0	0.22	0	1.00	74,653
	Panel B: Diversified firms					
Number of segments	2.86	3.00	1.14	2	10	25,142
Sales-shift	0.55	0.50	0.41	0	1	25,139
Distance-to-core	1.41	1.20	1.15	0	4	25,142
Distance-to-core level 1	0.15	0.00	0.29	0	1	25,142
Distance-to-core level 2	0.12	0.00	0.26	0	1	25,142
Distance-to-core level 3	0.11	0.00	0.22	0	1	25,142
Distance-to-core level 4	0.17	0.00	0.28	0	1	25,142
Tobin's Q	1.71	1.29	1.42	0.55	16.68	25,142
Size (mn $)	2,225.03	226.26	7,777.19	0.05	244,160.20	25,142
Sales (mn $)	1,945.69	238.75	6,534.85	0.04	306,731.00	25,142
Ebit-to-sales	-0.05	0.06	0.79	-19.93	0.37	25,142
Capex-to-sales	0.09	0.05	0.16	0	2.57	25,142
Leverage	0.61	0.58	0.44	0.01	11.86	25,142
Cash-to-assets	0.11	0.05	0.15	-0.02	0.99	25,140

Table 2: **Correlation matrices - full sample and diversified firms**

Table 2 shows the correlation between financial and diversification variables for the full sample of firms and for the sub sample of diversified firms. All variables are defined in Table 1. N is the number of non missing observations.

	Tobin's Q	Size	Ebit-to-sales	Capex-to-sales	Leverage	Cash-to-assets	Number of segments	Sales shifting	Sales shifting (weighted)	Divers. dummy	N
	Full sample										
Tobin's Q	1.00										99,790
Size	-0.24	1.00									99,790
Ebit-to-sales	-0.26	0.24	1.00								99,790
Capex-to-sales	0.05	0.01	-0.29	1.00							99,790
Leverage	0.23	-0.13	-0.08	-0.04	1.00						99,790
Cash-to-assets	0.31	-0.19	-0.29	0.08	-0.21	1.00					99,790
Number of segments	-0.10	0.33	0.08	-0.06	0.01	-0.14	1.00				99,790
Sales-shift	-0.11	0.21	0.07	-0.06	0.02	-0.15	0.66	1.00			99,790
Distance-to-core	-0.11	0.19	0.07	-0.05	0.02	-0.14	0.65	0.92	1.00		99,790
Diversification dummy	-0.12	0.27	0.09	-0.06	0.01	-0.16	0.82	0.76	0.73	1.00	99,790
	Diversified firms										
Tobin's Q	1.00										25,137
Size	-0.18	1.00									25,137
Ebit-to-sales	-0.22	0.22	1.00								25,137
Capex-to-sales	0.05	0.06	-0.21	1.00							25,137
Leverage	0.18	-0.03	-0.11	-0.01	1.00						25,137
Cash-to-assets	0.28	-0.19	-0.20	0.02	-0.21	1.00					25,137
Number of segments	-0.04	0.36	0.06	-0.03	0.02	-0.06	1.00				25,137
Sales-shif	-0.09	0.00	0.02	-0.04	0.05	-0.13	0.11	1.00			25,137
Distance-to-core	-0.09	-0.03	0.00	-0.03	0.06	-0.12	0.14	0.82	1.00		25,137

Table 3: **Correlation matrix - diversification measures**

Table 3 shows the correlation between financial and diversification variables for the full sample of firms and for the sub sample of diversified firms. Number of segments, Sales-shift, Distance-to-core and diversification dummy are defined in Table 1. The Herfindahl index of diversification is $H = \sum_i P_i^2$ and the total entropy measure is $E_t = \sum_i P_i^2 \ln(1/P_i)$ where P_i is he proportion of a firm's assets in industry i. Both measures are computed at a 4-digit SIC level. Unrelated entropy (E_U) is defined in the same manner as Total entropy, but computed at a 2-digit SIC level. Related entropy is $E_R = E_T - E_U$. Fan & Lan (2000) is computed as follows: $C = \sum_j (w_j \times C_{ij})$ where w_j is the proportion of the jth secondary segment 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 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. N is the number of non missing observations.

	Number of segments	Sales shifting	Sales shifting (weighted)	Div. dummy	(1 - Herfindahl index)	Total Entropy	Unrelated Entropy	Related Entropy	Fan & Lang (2000)	N
	Full sample									
Number of segments	1.0									99,802
Distance-to-core	0.66	1.00								99,802
Distance-to-core (weighted)	0.65	0.92	1.00							99,802
Diversification dummy	0.82	0.76	0.73	1.00						99,802
(1 - Herfindahl index)	0.64	0.51	0.50	0.65	1.00					99,802
Total Entropy	0.54	0.53	0.53	0.61	0.87	1.00				99,802
Unrelated Entropy	0.62	0.67	0.75	0.68	0.49	0.59	1.00			99,802
Related Entropy	0.21	0.15	0.09	0.25	0.71	0.80	-0.02	1.00		99,802
Fan & Lang (2000)	0.59	0.52	0.45	0.72	0.65	0.66	0.39	0.61	1.00	57,640
	Diversified firms									
Number of segments	1.00									25,139
Distance-to-core	0.11	1.00								25,139
Distance-to-core (weighted)	0.14	0.82	1.00							25,139
(1 - Herfindahl index)	0.23	0.03	0.04		1.00					25,139
Total Entropy	0.09	0.12	0.15		0.78	1.00				25,139
Unrelated Entropy	0.15	0.33	0.51		0.08	0.30	1.00			25,139
Related Entropy	0.01	-0.06	-0.13		0.74	0.84	-0.26	1.00		25,139
Fan & Lang (2000)	-0.03	-0.19	-0.28		0.01	0.00	-0.38	0.47	1.00	14,094

Table 4: **Full sample and diversified firms sub-sample fixed effects regressions of Distance-to-core on firm value controlling for additional diversification measures.**

Table 4 shows the impact of Distance-to-core and alternative diversification measures on firm value. The dependent variable in all regressions 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 number of segments is the number of business segments reported by the firm. Sales-shift is the proportion of firm sales that do not correspond to the core business. The core business of the firm is defined by the primary SIC code imputed to each firm by Compustat (dnum). 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, leverage and cash-to-assets are inlcuded as controls. All regressions are firm fixed effect regressions including year dummies. T-statistics are reported in parenthesis and standard errors are corrected for heteroskedasticity. N is the number of non missing observations.

	Full sample							Diversified firms		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Number of segments	-0.003			0.010	0.007		0.009	0.006		0.007
	(-1.39)			(3.32)	(2.66)		(3.03)	(1.93)		(2.19)
Sales-shift		-0.052		-0.055	-0.063	-0.053			-0.036	-0.040
		(-6.63)		(-5.03)	(-7.02)	(-4.89)			(-1.90)	(-2.09)
Diversification dummy			-0.023	-0.013		0.001	-0.038			
			(-4.39)	(-1.57)		(0.18)	(-5.29)			
Size	-0.109	-0.108	-0.108	-0.108	-0.109	-0.108	-0.109	-0.107	-0.105	-0.107
	(-35.68)	(-35.35)	(-35.39)	(-35.35)	(-35.40)	(-35.28)	(-35.44)	(-15.71)	(-15.69)	(-15.72)
Ebit-to-sales	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.028	0.027	0.028
	(4.03)	(4.03)	(4.03)	(4.05)	(4.04)	(4.03)	(4.05)	(3.25)	(3.24)	(3.24)
Capex-to-sales	0.150	0.149	0.150	0.149	0.149	0.149	0.150	0.175	0.173	0.174
	(14.21)	(14.10)	(14.15)	(14.12)	(14.12)	(14.10)	(14.17)	(5.68)	(5.61)	(5.65)
Leverage	0.514	0.511	0.512	0.511	0.512	0.511	0.512	0.478	0.474	0.476
	(32.64)	(32.45)	(32.50)	(32.46)	(32.49)	(32.45)	(32.51)	(11.90)	(11.81)	(11.86)
Cash-to-assets	0.175	0.006	0.175	0.175	0.175	0.175	0.175	0.162	0.162	0.162
	(40.55)	(40.63)	(40.58)	(40.61)	(40.62)	(40.63)	(40.57)	(12.49)	(12.50)	(12.48)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.139	0.140	0.140	0.140	0.140	0.140	0.140	0.127	0.127	0.127
N	99,760	99,790	99,760	99,790	99,790	99,790	99,760	25,137	25,137	25,137

Table 5: **Full sample and diversified firms sub-sample fixed effects regressions of Distance-to-core - weighted on firm value.**

This table shows the results of replicating the models in table 4 using now a measure of Distance-to-core by the distance of the business segments to the core business of the firm, instead of total sales shifting. Distance-to-core is: $D_W = \sum_i W_i d(c,i)$where W_i is the proportion of segment i sales in firm sales and $d(c,i)$ is the distance between segment's industry and core business' industry. The distance 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.

	Full sample				Diversified firms	
	(1)	(2)	(3)	(4)	(5)	(6)
Number of segments		0.010	0.006			0.008
		(3.42)	(2.46)			(2.36)
Distance-to-core	-0.019	-0.020	-0.023	-0.019	-0.014	-0.015
	(-6.63)	(-5.22)	(-6.86)	(-5.06)	(-2.49)	(-2.74)
Diversification dummy		-0.016		-0.001		
		(-1.98)		(-0.11)		
Size	-0.108	-0.108	-0.108	-0.108	-0.104	-0.106
	(-35.24)	(-35.25)	(-35.30)	(-35.17)	(-15.62)	(-15.68)
Ebit-to-sales	0.009	0.009	0.009	0.009	0.027	0.027
	(4.03)	(4.05)	(4.04)	(4.03)	(3.21)	(3.21)
Capex-to-sales	0.149	0.149	0.149	0.149	0.172	0.173
	(14.05)	(14.06)	(14.06)	(14.05)	(5.57)	(5.61)
Leverage	0.175	0.175	0.175	0.175	0.162	0.162
	(40.65)	(40.63)	(40.63)	(40.65)	(12.50)	(12.47)
Cash-to-assets	0.511	0.511	0.512	0.511	0.475	0.478
	(32.47)	(32.48)	(32.51)	(32.47)	(11.86)	(11.91)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.140	0.140	0.140	0.140	0.127	0.128
N	99,793	99,793	99,793	99,793	25,140	25,140

Table 6: **Full sample and diversified firms sub-sample fixed effects regressions of Distance-to-core levels on firm value.**

Table 6 shows the results of replicating the models in table 4 using a desegregated measure of Distance-to-core that considers separatedly the different distances of the segments to the core business of the firm. Distance-to-core level 1, 2, 3 and 4 is the proportion of sales in segments at distance 1,2,3 and 4 from the core business, respectively. The distance will assume a value of 1 if the segment's SIC code differs from the core business SIC code in the 4th digit and not in the 1st, 2nd or 3rd, a value of 2 if the segment's SIC code differs from the core business SIC code in the 3rd digit and not in the 1st or 2nd, a value of 3 if the segment's SIC code differs from the core business SIC code in the 2nd digit and not in the 1st and finally a value of 4, if the segment's SIC code differs from the core business SIC code in the 1st digit. The core business of the firm is defined by the primary SIC code imputed to each firm by Compustat (dnum). All the regressions include year dummies and the same controls as in table 4. T-statistics are reported in parenthesis and standard errors are corrected for heteroskedasticity. N is the number of non missing observations.

	Full sample				Diversified firms	
	(1)	(2)	(3)	(4)	(5)	(6)
Distance-to-core level 1	-0.031	-0.042	-0.034	-0.034	-0.011	-0.012
	(-2.49)	(-3.22)	(-2.34)	(-2.37)	(-0.41)	(-0.45)
Distance-to-core level 2	-0.042	-0.055	-0.045	-0.047	-0.016	-0.020
	(-2.26)	(-2.84)	(-2.20)	(-2.29)	(-0.51)	(-0.62)
Distance-to-core level 3	-0.070	-0.083	-0.072	-0.074	-0.056	-0.060
	(-4.24)	(-4.83)	(-3.98)	(-4.08)	(-2.19)	(-2.36)
Distance-to-core level 4	-0.069	-0.083	-0.071	-0.074	-0.049	-0.055
	(-4.79)	(-5.35)	(-4.33)	(-4.48)	(-2.01)	(-2.23)
Number of segments		0.007		0.010		2.360
		(2.81)		(3.41)		(2.36)
Diversification dummy			0.002	-0.013		
			(0.31)	(-1.51)		
Size	-0.108	-0.108	-0.108	-0.108	-0.104	-0.106
	(-35.23)	(-35.30)	(-35.17)	(-35.25)	(-15.62)	(-15.68)
Ebit-to-sales	0.009	0.009	0.009	0.009	0.027	0.027
	(4.03)	(4.04)	(4.03)	(4.05)	(3.21)	(3.22)
Capex-to-sales	0.149	0.149	0.149	0.149	0.172	0.173
	(14.05)	(14.08)	(14.06)	(14.07)	(5.57)	(5.61)
Leverage	0.175	0.175	0.175	0.175	0.162	0.162
	(40.64)	(40.63)	(40.64)	(40.63)	(12.51)	(12.48)
Cash-to-assets	0.511	0.511	0.511	0.511	0.476	0.478
	(32.44)	(32.48)	(32.45)	(32.46)	(11.85)	(11.91)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.140	0.140	0.140	0.140	0.128	0.128
N	99,793	99,793	99,793	99,793	25,140	25,140

Table 7: **Distance-to-core effect on firm value for firms with different levels of managerial discretion.**

This table presents the results of splitting the sample according to the level of managerial discretion of the industries where the company operates, considering both the core business and secondary segments (the periphery). This industry classification of managerial discretion is defined using an index developed by Hambrick and Abrahamson (1995). Each firm will have two levels of managerial discretion: one according to its core business and the second according to its periphery. The firm will be defined as having a high (low) level of managerial discretion in its core business if the core business industry has a managerial discretion score above (below) the median discretion score. The level of discretion of the periphery is defined using the average of secondary segments' industries scores weighted by segment sales. Then, the firm will be defined as having a high (low) level of managerial discretion in its periphery if this average score is above(below) the median score. The Sales-shift and Distance-to-core measures are as previously defined. The All the regressions are fixed effects regressions and include year dummies and the same controls as in table 4. T-statistics are reported in parenthesis and standard errors are corrected for heteroskedasticity. N is the number of non missing observations.

	Core business						Periphery					
	High managerial discretion			Low managerial discretion			High managerial discretion			Low managerial discretion		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Number of segments	0.013	0.014	0.014	0.010	0.010	0.010	0.011	0.011	0.011	0.015	0.014	0.015
	(1.67)	(1.71)	(1.69)	(1.69)	(1.79)	(1.76)	(1.28)	(1.35)	(1.32)	(2.43)	(2.37)	(2.49)
Sales-shift	-0.097			0.018			-0.083			-0.011		
	(-2.34)			(0.60)			(-1.79)			(-0.32)		
Distance-to-core		-0.029			-0.001			-0.029			0.001	
		(-2.46)			(-0.07)			(-2.07)			(0.07)	
Distance-to-core - level 1			-0.050			0.085			-0.043			-0.016
			(-0.85)			(1.86)			(-0.68)			(-0.34)
Distance-to-core- level 2			-0.079			0.024			-0.066			-0.013
			(-1.03)			(0.44)			(-0.85)			(-0.22)
Distance-to-core- level 3			-0.152			-0.084			-0.116			-0.165
			(-2.51)			(-1.80)			(-1.66)			(-2.92)
Distance-to-core - level 4			-0.103			0.039			-0.110			0.034
			(-1.89)			(0.94)			(-1.70)			(0.81)
Size	-0.135	-0.135	-0.135	-0.105	-0.105	-0.107	-0.128	-0.127	-0.127	-0.120	-0.120	-0.120
	(-10.09)	(-10.07)	(-10.07)	(-8.53)	(-8.52)	(-8.58)	(-9.35)	(-9.29)	(-9.28)	(-9.03)	(-9.00)	(-8.95)
Ebit-to-sales	0.018	0.018	0.018	0.034	0.034	0.035	0.025	0.025	0.025	0.044	0.044	0.044
	(1.45)	(1.47)	(1.48)	(2.03)	(1.99)	(2.04)	(1.61)	(1.64)	(1.63)	(2.73)	(2.74)	(2.74)
Capex-to-sales	0.270	0.273	0.273	0.113	0.112	0.114	0.253	0.253	0.253	0.102	0.103	0.102
	(3.31)	(3.31)	(3.34)	(2.73)	(2.70)	(2.75)	(2.88)	(2.88)	(2.89)	(2.63)	(2.63)	(2.60)
Leverage	0.121	0.121	0.121	0.177	0.177	0.178	0.115	0.115	0.116	0.171	0.171	0.173
	(5.01)	(4.99)	(5.01)	(7.46)	(7.43)	(7.47)	(4.77)	(4.76)	(4.76)	(7.06)	(7.07)	(7.16)
Cash-to-assets	0.669	0.671	0.670	0.248	0.248	0.252	0.664	0.667	0.667	0.199	0.199	0.203
	(9.94)	(9.98)	(9.96)	(3.62)	(3.61)	(3.66)	(10.17)	(10.23)	(10.21)	(2.69)	(2.70)	(2.73)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R2	0.155	0.156	0.156	0.112	0.112	0.114	0.156	0.157	0.157	0.116	0.116	0.118
N	8,022	8,022	8,022	8,289	8,290	8,290	8,160	8,160	8,160	8,050	8,051	8,051

Table 8: **Two period regressions of Distance-to-core on firm value: 1984 to 1994 and 1995 to 2005.**

This table shows the results of regressing the Distance-to-core measures on firm value for two different sample periods. Both sample periods consist of 11 years being the first one from 1984 to 1994 and the second from 1995 to 2005. The table also reports the results for the full sample and the sub-sample of diversified firms. The Sales-shift and Distance-to-core measures are as previously defined. All the regressions are fixed effects regressions and include year dummies and the same controls as in table 4. T-statistics are reported in parenthesis and standard errors are corrected for heteroskedasticity. N is the number of non missing observations.

	Full sample						Diversified firms					
	1984-1994			1995-2005			1984-1994			1995-2005		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Number of segments	-0.015	-0.013	-0.013	0.016	0.016	0.016	-0.013	-0.012	-0.012	0.024	0.024	0.024
	(-3.71)	(-3.38)	(-3.38)	(3.43)	(3.42)	(3.41)	(-3.12)	(-2.86)	(-2.82)	(4.23)	(4.18)	(4.18)
Sales-shift	-0.071			-0.026			-0.081			-0.022		
	(-4.44)			(-1.51)			(-3.45)			(-0.55)		
Distance-to-core		-0.024			-0.012			-0.026			-0.001	
		(-4.77)			(-1.70)			(-3.79)			(-0.05)	
Distance-to-core - level 1			-0.029			-0.024			-0.022			-0.089
			(-1.28)			(-1.10)			(-0.76)			(-1.47)
Distance-to-core - level 2			-0.060			0.009			-0.100			0.054
			(-2.19)			(0.27)			(-2.57)			(0.83)
Distance-to-core - level 3			-0.102			-0.027			-0.088			-0.095
			(-4.24)			(-0.68)			(-2.72)			(-1.50)
Distance-to-core - level 4			-0.088			-0.057			-0.103			-0.002
			(-4.12)			(-1.75)			(-3.40)			(-0.04)
Diversification dummy	0.034	0.031	0.034	-0.044	-0.043	-0.043						
	(2.73)	(2.66)	(2.72)	(-3.35)	(-3.43)	(-3.27)						
Size	-0.120	-0.120	-0.120	-0.153	-0.153	-0.153	-0.100	-0.100	-0.100	-0.162	-0.162	-0.162
	(-24.30)	(-24.25)	(-24.24)	(-28.73)	(-28.72)	(-28.72)	(-10.62)	(-10.57)	(-10.57)	(-12.02)	(-12.04)	(-12.01)
Ebit-to-sales	0.011	0.011	0.011	0.012	0.012	0.012	0.056	0.057	0.057	0.025	0.024	0.024
	(2.67)	(2.70)	(2.69)	(4.59)	(4.59)	(4.59)	(3.18)	(3.20)	(3.19)	(2.22)	(2.21)	(2.20)
Capex-to-sales	0.121	0.120	0.120	0.156	0.155	0.155	0.165	0.164	0.166	0.141	0.140	0.137
	(8.46)	(8.43)	(8.44)	(9.73)	(9.71)	(9.70)	(4.22)	(4.18)	(4.22)	(2.81)	(2.79)	(2.76)
Leverage	0.190	0.190	0.190	0.144	0.144	0.144	0.185	0.183	0.183	0.136	0.136	0.137
	(22.79)	(22.83)	(22.81)	(25.44)	(25.44)	(25.44)	(8.29)	(8.22)	(8.21)	(6.75)	(6.77)	(6.78)
Cash-to-assets	0.394	0.394	0.394	0.519	0.519	0.519	0.353	0.356	0.355	0.633	0.636	0.632
	(17.14)	(17.16)	(17.14)	(21.93)	(21.93)	(21.93)	(6.97)	(7.04)	(7.02)	(9.76)	(9.82)	(9.79)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R2	0.122	0.122	0.122	0.167	0.167	0.167	0.109	0.110	0.110	0.162	0.162	0.163
N	49,292	49,293	49,293	50,498	50,500	50,500	13,225	13,226	13,226	11,908	11,910	11,910

Table 9: **Full sample and diversified firms fixed effects regressions of Distance-to-core on operational performance.**

This table show the effect of Distance-to-core, measured using the aggregated measure, the weighted measure and the desegregated measure on ROA (return on assets). The dependent variable in all regressions is ROA defined as the ratio between EBITA (earnings before interest taxes and amortizations) and total assets. The remaining variables are as defined in Table 1. All the regressions are fixed effects 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.

	Full sample						Diversified firms					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Number of segments				-0.010	-0.010	-0.010				-0.003	-0.003	-0.003
				(-7.48)	(-7.33)	(-7.34)				(-2.66)	(-2.50)	(-2.54)
Sales-shift	-0.035			-0.018			-0.043			-0.041		
	(-6.62)			(-2.88)			(-5.49)			(-5.18)		
Distance-to-core		-0.013			-0.007			-0.012			-0.011	
		(-6.17)			(-2.89)			(-4.92)			(-4.60)	
Distance-to-core - level 1			-0.019			-0.005			-0.038			-0.038
			(-2.26)			(-0.57)			(-2.82)			(-2.79)
Distance-to-core - level 2			-0.032			-0.015			-0.016			-0.015
			(-3.46)			(-1.51)			(-1.36)			(-1.23)
Distance-to-core - level 3			-0.063			-0.046			-0.042			-0.040
			(-8.13)			(-5.27)			(-4.16)			(-3.93)
Distance-to-core - level 4			-0.040			-0.022			-0.052			-0.050
			(-3.69)			(-1.87)			(-4.94)			(-4.65)
Diversification dummy				0.000	0.000	0.001						
				(0.08)	(0.04)	(0.12)						
Size	0.095	0.095	0.095	0.096	0.096	0.096	0.039	0.040	0.040	0.040	0.040	0.040
	(24.58)	(24.60)	(24.60)	(24.61)	(24.63)	(24.63)	(8.91)	(9.01)	(9.02)	(8.98)	(9.05)	(9.05)
Capex-to-sales	-0.115	-0.115	-0.115	-0.115	-0.115	-0.115	-0.084	-0.083	-0.084	-0.084	-0.084	-0.084
	(-14.58)	(-14.61)	(-14.59)	(-14.63)	(-14.64)	(-14.63)	(-4.23)	(-4.21)	(-4.24)	(-4.25)	(-4.23)	(-4.26)
Leverage	-0.203	-0.203	-0.203	-0.203	-0.202	-0.202	-0.145	-0.145	-0.145	-0.145	-0.145	-0.145
	(-13.30)	(-13.30)	(-13.30)	(-13.30)	(-13.30)	(-13.29)	(-6.37)	(-6.38)	(-6.38)	(-6.37)	(-6.38)	(-6.38)
Cash-to-assets	0.006	0.006	0.006	0.006	0.005	0.005	0.056	0.056	0.056	0.055	0.055	0.055
	(0.38)	(0.38)	(0.36)	(0.33)	(0.32)	(0.32)	(2.49)	(2.50)	(2.49)	(2.45)	(2.46)	(2.45)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.153	0.153	0.153	0.154	0.154	0.154	0.099	0.099	0.100	0.100	0.099	0.100
N	99,606	99,609	99,609	99,606	99,609	99,609	25,102	25,105	25,105	25,102	25,105	25,105

Table 10: **Using maximum sales segment's industry as alternative definition of core business.**

Table 9 presents the robustness tests using an alternative way to define the core business of the firm. The core business industry is now defined by the SIC code of the segment with the maximum sales. The dependent variable in all regressions 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. Sales-shift (2) is the percentage of business segments' sales that do not correspond to the core business of the firm with respect to total sales of the firm. The core business of the firm is defined by the SIC imputed to the segment with the largest sales. Distance-to-core (2) is $D_{(2)} = \sum_i W_i d(c_2, i)$ where W_i is the proportion of segment i sales in firm sales and $d(c_2, i)$ is the distance between segment's industry and core business' industry. The distance 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. The remaining variables are as defined in Table 1. All the regressions include year dummies. T-statistics are reported in parenthesis and standard errors are corrected for heteroskedasticity. N is the number of non missing observations.

	Full sample						Diversified firms					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Number of segments				0.012	0.011	0.011				0.010	0.010	0.010
				(3.73)	(3.67)	(3.62)				(3.05)	(2.85)	(3.03)
Sales-shift (2)	-0.076			-0.067			-0.073			-0.094		
	(-4.92)			(-3.26)			(-3.14)			(-3.76)		
Distance-to-core (2)		-0.023			-0.020			-0.019			-0.025	
		(-4.96)			(-3.33)			(-2.82)			(-3.39)	
Dist-to-core. (2) - lev. 1			-0.001			0.005			-0.070			-0.092
			(-0.02)			(0.10)			(-1.23)			(-1.57)
Dist-to-core. (2) - lev. 2			-0.047			-0.039			-0.038			-0.057
			(-1.57)			(-1.20)			(-1.10)			(-1.61)
Dist-to-core. (2) - lev. 3			-0.150			-0.139			-0.138			-0.158
			(-6.31)			(-5.08)			(-4.40)			(-4.84)
Dist-to-core. (2) - lev. 4			-0.062			-0.052			-0.054			-0.075
			(-2.92)			(-2.07)			(-1.83)			(-2.44)
Diversification dummy				-0.029	-0.030	-0.029						
				(-3.90)	(-4.00)	(-3.83)						
Size	-0.108	-0.108	-0.108	-0.108	-0.108	-0.108	-0.103	-0.103	-0.104	-0.106	-0.106	0.010
	(-35.45)	(-35.43)	(-35.42)	(-35.32)	(-35.29)	(-35.30)	(-15.41)	(-15.33)	(-15.39)	(-15.63)	(-15.52)	(3.03)
Ebit-to-sales	0.009	0.009	0.009	0.009	0.009	0.009	0.027	0.027	0.027	0.027	0.027	-0.106
	(3.98)	(4.01)	(3.99)	(4.00)	(4.03)	(4.01)	(3.23)	(3.22)	(3.23)	(3.23)	(3.22)	(-15.61)
Capex-to-sales	0.150	0.150	0.150	0.150	0.149	0.150	0.173	0.172	0.173	0.175	0.174	0.027
	(14.13)	(14.12)	(14.13)	(14.13)	(14.12)	(14.13)	(5.61)	(5.59)	(5.63)	(5.67)	(5.64)	(3.23)
Leverage	0.175	0.175	0.175	0.175	0.175	0.175	0.163	0.163	0.163	0.163	0.163	0.473
	(40.59)	(40.60)	(40.59)	(40.58)	(40.59)	(40.58)	(12.58)	(12.59)	(12.55)	(12.56)	(12.58)	(11.78)
Cash-to-assets	0.512	0.512	0.512	0.511	0.511	0.511	0.471	0.472	0.470	0.473	0.474	0.174
	(32.50)	(32.52)	(32.50)	(32.44)	(32.46)	(32.44)	(11.72)	(11.77)	(11.73)	(11.77)	(11.82)	(5.68)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.140	0.140	0.140	0.140	0.140	0.140	0.128	0.128	0.128	0.128	0.128	0.128
N	99,786	99,793	99,786	99,786	99,793	99,786	25,137	25,140	25,137	25,137	25,140	25,137

Table 11: **Using alternative diversification measures: Fan and Lang relatedness measure, pure and adjusted for sales proportion.**

This table presents the robustness tests results of using an alternative way of measuring the unrelatedness between business segments. The dependent variable in all regressions 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. Independent variables are as defined in Table 1. All the regressions include year dummies. Industry dummies, when included, 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.

	Full sample			Diversified firms		
	(1)	(2)	(3)	(4)	(5)	(6)
Number of segments	-0.017	-0.018	-0.012	-0.014	-0.015	-0.012
	(-4.37)	(-4.39)	(-2.63)	(-3.45)	(-3.39)	(-2.59)
F&L div. measure - pure	-0.002			-0.028		
	(-0.12)			(-1.42)		
F&L div. Measure - inv		-0.035			-0.006	
		(-2.11)			(-0.27)	
F&L sales proportion - adjusted			-0.125			-0.053
			(-3.55)			(-1.32)
Diversification dummy	-0.003	0.015	0.004			
	(-0.27)	(1.09)	(0.42)			
Size	-0.112	-0.114	-0.114	-0.089	-0.092	-0.092
	(-25.75)	(-25.51)	(-25.47)	(-10.15)	(-9.90)	(-9.85)
Ebit-to-sales	0.016	0.015	0.015	0.054	0.054	0.054
	(4.19)	(3.98)	(3.96)	(3.30)	(3.27)	(3.25)
Capex-to-sales	0.146	0.141	0.141	0.158	0.145	0.145
	(10.79)	(10.36)	(10.36)	(4.12)	(3.47)	(3.47)
Leverage	0.179	0.178	0.179	0.168	0.160	0.161
	(25.27)	(24.26)	(24.29)	(9.34)	(8.37)	(8.39)
Cash-to-assets	0.436	0.447	0.446	0.320	0.325	0.323
	(20.91)	(20.91)	(20.88)	(6.52)	(6.17)	(6.14)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.108	0.108	0.108	0.112	0.110	0.111
N	57,635	55,983	55,983	14,094	13,157	13,157

Table 12: **Using alternative estimation method - OLS.**

This table presents the robustness tests results for the full sample of firms using OLS as an alternative estimation method. The dependent variable in all regressions 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. Independent variables are as defined in Table 1. All the regressions include year dummies. Industry dummies, when included, 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.

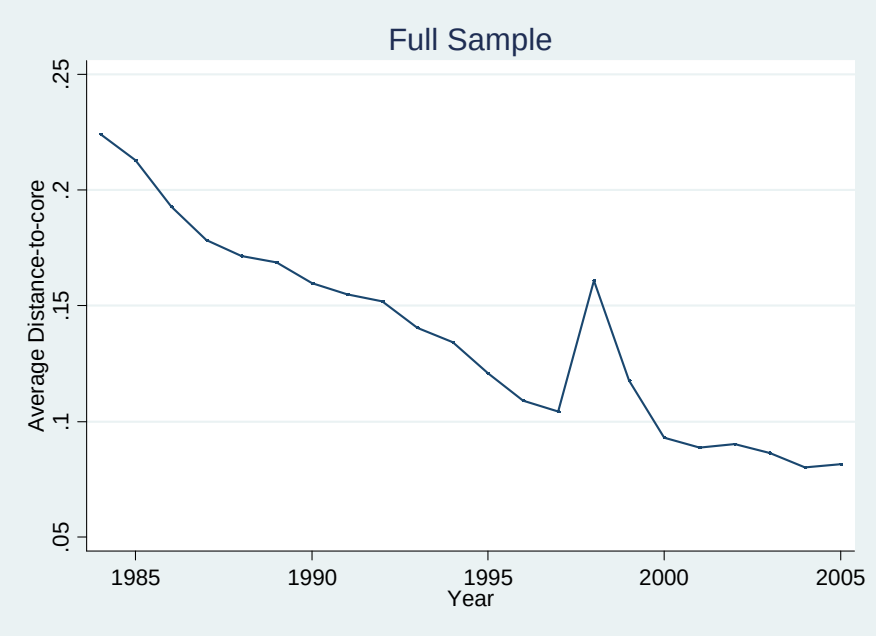
	Full sample						Diversified firms					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Number of segments	0.018	0.008	0.019	0.010	0.019	0.010	0.007	0.001	0.009	0.003	0.009	0.003
	(3.94)	(1.88)	(4.23)	(2.17)	(4.25)	(2.17)	(1.57)	(0.31)	(1.92)	(0.66)	(1.90)	(0.66)
Sales-shift	-0.078	-0.066					-0.064	-0.061				
	(-5.31)	(-4.59)					(-4.35)	(-4.06)				
Dist-to-core			-0.032	-0.028					-0.026	-0.025		
			(-5.91)	(-5.23)					(-4.67)	(-4.45)		
Dist-to-core- level 1					-0.041	-0.042					-0.035	-0.046
					(-2.08)	(-2.18)					(-1.78)	(-2.31)
Dist-to-core- level 2					-0.059	-0.028					-0.062	-0.028
					(-2.52)	(-1.18)					(-2.55)	(-1.11)
Dist-to-core - level 3					-0.147	-0.120					-0.125	-0.094
					(-5.56)	(-4.58)					(-4.65)	(-3.43)
Dist-to-core- level 4					-0.111	-0.105					-0.087	-0.096
					(-4.79)	(-4.47)					(-3.69)	(-3.90)
Diversification dummy	-0.037	-0.025	-0.038	-0.025	-0.034	-0.023						
	(-2.83)	(-2.03)	(-3.08)	(-2.11)	(-2.65)	(-1.86)						
Size	-0.028	-0.021	-0.028	-0.021	-0.028	-0.022	-0.015	-0.011	-0.015	-0.012	-0.015	-0.012
	(-13.22)	(-10.02)	(-13.31)	(-10.07)	(-13.20)	(-10.07)	(-4.24)	(-3.25)	(-4.44)	(-3.38)	(-4.25)	(-3.43)
Ebit-to-sales	-0.032	-0.024	-0.032	-0.024	-0.032	-0.024	-0.044	-0.039	-0.045	-0.040	-0.045	-0.040
	(-13.17)	(-10.05)	(-13.20)	(-10.08)	(-13.21)	(-10.08)	(-5.03)	(-4.47)	(-5.13)	(-4.58)	(-5.11)	(-4.56)
Capex-to-sales	0.051	0.118	0.052	0.118	0.051	0.118	0.113	0.149	0.114	0.145	0.108	0.146
	(4.44)	(9.58)	(4.45)	(9.50)	(4.36)	(9.53)	(3.72)	(4.34)	(3.76)	(4.23)	(3.55)	(4.26)
Leverage	0.232	0.235	0.232	0.235	0.232	0.235	0.919	0.771	0.924	0.774	0.920	0.773
	(48.79)	(49.48)	(48.88)	(49.52)	(48.79)	(49.52)	(18.85)	(15.84)	(18.98)	(15.94)	(18.94)	(15.93)
Cash-to-assets	0.959	0.789	0.960	0.789	0.960	0.789	0.208	0.210	0.210	0.211	0.209	0.211
	(48.44)	(38.98)	(48.50)	(39.03)	(48.50)	(39.01)	(20.22)	(20.43)	(20.36)	(20.40)	(20.07)	(20.44)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
R^2	0.233	0.269	0.233	0.269	0.233	0.269	0.183	0.228	0.184	0.229	0.185	0.229
N	99,790	99,790	99,793	99,793	99,793	99,793	25,137	25,137	25,140	25,140	25,140	25,140

Table 13: **Using alternative estimation method - Median regression.**

This table presents the robustness tests results for the full sample of firms using median regression as an alternative estimation method. The dependent variable in all regressions is 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. Independent variables are as defined in Table 1. All the regressions include year dummies. Industry dummies, when included, are defined using 2 digit SIC code. T-statistics are reported in parenthesis. N is the number of non missing observations.

	Full sample						Diversified firms					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Number of segments	0.014	-0.002	0.017	0.001	0.017	0.002	0.000	-0.008	0.003	-0.005	0.002	-0.004
	(3.12)	(-0.42)	(3.62)	(0.20)	(3.55)	(0.42)	(0.14)	(-2.47)	(0.84)	(-1.55)	(0.62)	(-1.21)
Sales-shift	-0.044	-0.044					-0.040	-0.051				
	(-3.57)	(-3.49)					(-4.70)	(-5.73)				
Dist-to-core			-0.027	-0.027					-0.021	-0.029		
			(-5.79)	(-6.29)					(-6.46)	(-9.02)		
Dist-to-core - level 1					0.004	-0.002					0.009	-0.021
					(0.24)	(-0.12)					(0.74)	(-1.71)
Dist-to-core - level 2					-0.028	-0.017					-0.056	-0.045
					(-1.32)	(-0.81)					(-3.81)	(-2.92)
Dist-to-core- level 3					-0.072	-0.063					-0.062	-0.059
					(-2.88)	(-2.63)					(-3.51)	(-3.29)
Dist-to-core - level 4					-0.120	-0.126					-0.081	-0.126
					(-5.89)	(-6.55)					(-5.61)	(-8.75)
Diversification dummy	-0.044	-0.021	-0.034	-0.010	-0.041	-0.021						
	(-3.80)	(-1.80)	(-2.92)	(-0.89)	(-3.32)	(-1.78)						
Size	-0.019	-0.010	-0.020	-0.010	-0.020	-0.010	0.000	0.002	0.000	0.002	0.001	0.002
	(-15.32)	(-7.40)	(-14.91)	(-7.49)	(-14.67)	(-7.35)	(0.13)	(1.36)	(0.05)	(1.32)	(0.62)	(1.24)
Ebit-to-sales	-0.119	-0.100	-0.119	-0.101	-0.119	-0.101	-0.142	-0.119	-0.147	-0.115	-0.146	-0.121
	(-65.02)	(-53.92)	(-62.14)	(-55.09)	(-61.07)	(-53.99)	(-31.47)	(-26.83)	(-31.50)	(-26.44)	(-29.93)	(-26.21)
Capex-to-sales	0.085	0.203	0.086	0.199	0.086	0.199	0.116	0.152	0.111	0.145	0.116	0.142
	(7.67)	(16.59)	(7.38)	(16.55)	(7.26)	(16.18)	(5.56)	(6.77)	(5.20)	(6.60)	(5.10)	(6.10)
Cash-to-assets	0.684	0.703	0.684	0.705	0.685	0.705	1.517	1.302	1.524	1.304	1.528	1.298
	(157.45)	(161.03)	(150.47)	(164.52)	(147.99)	(161.06)	(62.56)	(52.95)	(60.98)	(54.25)	(58.14)	(50.87)
Leverage	2.214	1.926	2.217	1.930	2.219	1.931	0.348	0.374	0.356	0.385	0.358	0.386
	(167.33)	(138.66)	(160.02)	(141.61)	(157.43)	(138.76)	(44.68)	(48.52)	(44.21)	(50.89)	(42.30)	(48.19)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
R^2	0.106	0.122	0.107	0.122	0.107	0.122	0.062	0.084	0.063	0.085	0.063	0.085
N	99,790	99,790	99,793	99,793	99,793	99,793	25,137	25,137	25,140	25,140	25,140	25,140

Figure 1: **Average distance-to-core 1984-2005**



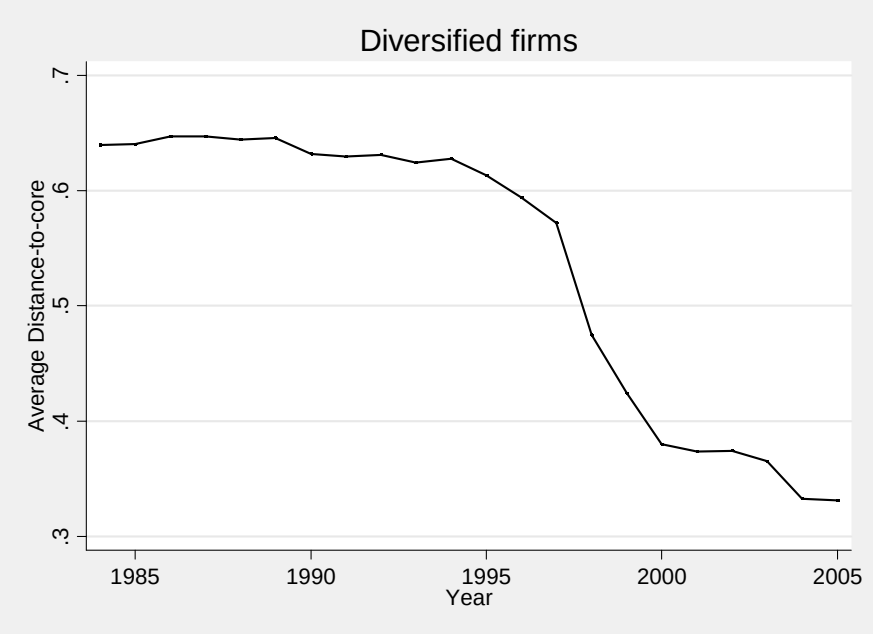


Figure 2: **Average levels of Distance-to-core (1984-2005)**