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# **The Effects of Corporate Diversification**

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## **Abstract**

Diversification is a popular strategy in both the 20<sup>th</sup> and 21<sup>st</sup> century. However, studies that investigate the effects of diversification on profitability don't provide a consistent conclusion and studies that focus on market value find a diversification discount. This study empirically examines the effect of diversification on both the market value and future profitability of acquiring firms using a sample of 281 mergers covering the period 2013-2015 in the United States. The results provide no evidence that supports the existence of a diversification discount. However, diversification does result in a short term increase in profitability.

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## I. Introduction

In the second half of the 20<sup>th</sup> century the vast majority of United States based firms engaged in diversification. Between 1949 and 1974 the proportion of the 500 largest industrial firms that were highly diversified more than doubled (Rumelt, 1982). The increasing trend of diversification peaked throughout the 1960's and 1970's, because of the general view that large diversified firms could operate unrelated businesses more efficiently than they could operate as separate units (Lang & Stulz, 1994).

This idea was rooted in the theory that diversification enables companies to make use of an internal capital market, which allocates resources more efficiently than external markets (Lang & Stulz, 1994). Besides, diversifying into an industry that shares a common skill or resource with the industry in which a company already operates, could enable a firm to exploit economies of scope (Rumelt, 1974). Diversification thus became an important part of strategic management and the actual effects of pursuing a diversification strategy became a subject of considerable interest to both managers and academics (Palepu, 1985).

Consequently, several studies investigated the effects of pursuing a diversification strategy. The first line of research focuses on the effect of diversification on a firm's economic performance. Gort (1962), Arnould (1969) and Markham (1973) find no significant relationship between diversification and performance, but Rumelt (1974, 1982) and Christensen & Montgomery (1981) do report a significant effect. However, only certain specific diversification strategies have a positive impact on a firm's profitability, whereas the other diversification strategies decrease profitability.

In the 1990's the focus of research shifts towards the effect of diversification on market value rather than the effect on profitability. Under the assumption that the efficient market hypothesis holds, when diversification indeed increases future profitability these prospects are incorporated in the market value of diversified firms. However, Lang and Stulz (1994), Berger and Ofek (1995) and Morck, Shleifer and Vishny (1990) all find that diversification has a negative effect on market value.

Nevertheless, many of the current largest and most influential firms still pursue a diversification strategy. Large companies often operate in multiple industries. Sometimes these industries are connected by subtle economies of scope, such as the design skills that

allow Apple to succeed in both smartphones and computers. In many cases however, the possibilities for economies of scope are marginal (Besanko, Dranove, Shanley, & Schaefer, 2009).

The fact that diversification is still a popular strategy, while research suggests that diversification destroys rather than creates value is paradoxical. This thesis therefore aims to investigate the relationship between diversification and market value with recent data in a cross-sectional analysis. Besides, it will try to identify factors that influence this relationship. Consequently, it's legitimate to examine the following research question:

*'To what extent does corporate diversification influence a firm's market value?'*

Moreover, the relationship between diversification and profitability in the three years after a firm diversifies is investigated. This way, this thesis aims to provide a complete analysis of the current effects of diversification.

The paper proceeds as follows. Section II contains a review of the relevant literature on the effects of diversification. In section III the hypotheses used to conduct the study are formulated. Section IV shows which datasources are used and what modifications led to the final dataset. In section V the methodology is discussed. Subsequently, in section VI the results of the study are presented and section VII contains concluding remarks based on those results.

## **II. Literature review**

This chapter discusses the relevant literature regarding diversification. First, an explanation on the theory of diversification is given, as well as a definition of several concepts. Second, earlier empirical research that investigates the correlation between diversification and economic performance is addressed. The third part covers the relevant studies that investigate the relationship between diversification and market value.

### **2.1 Diversification theory**

Diversification is the process in which a company enters a different industry than the industry in which it currently operates. Companies generally engage in diversification with the aim to create value. Diversification is expensive, especially when one firm acquires another. Besides, apart from the costs of an acquisition, the resulting company may incur a consecutive increase in bureaucracy spendings. The created value should therefore outweigh the incurred costs in order to make diversification profitable (Besanko et al., 2009).

The creation of value by means of diversification may arise from both efficiency-based and organisational factors. The first and main efficiency-based factor is economies of scope. Economies of scope occur when a company can use a certain skill or production factor over different industries it operates in. Rumelt (1982) defines three criteria that enable a firm to exploit economies of scope. First, there must be increasing returns to scale on one or more key factors of production. Second, an efficient market for these factors is absent due to transaction costs. Third, a firm must have limited possibility of obtaining increased factor utilization by expanding the output of a single product.

Furthermore, combining unrelated businesses enables firms to make use of an internal capital market. In this case, a firm can use the profits of one line of business to fund investments in another. By reallocating the capital of successful businesses to starting businesses, a company can fund projects with future profitability prospects internally. Stein (1997) claims that the use of internal capital markets instead of financial markets is beneficial for several reasons. First, the use of internal capital markets eliminates the transaction costs incurred due to asymmetric information between a company and an outside financial institution. Second, outside investors may be reluctant to lend money to a firm that already has existing debt. Third, outside financiers may consume monitoring resources in order to ensure the managers within a firm serve their interests. This increases the actual costs of the borrowing firm.

Organisational factors also create value when firms diversify. Value can arise from spreading underused organisational resources. Prahalad and Bettis (1986) state that managers of diversified firms spread their own management skills over seemingly unrelated businesses. They refer to this practice as dominant general management logic. A manager with superior skills in a specific area may use his expertise in a different industry without losing efficiency due to having an excessive amount of tasks. However, this theory should be used with caution, since managers might overestimate themselves or might be tempted to enter an industry that does not require their specific skill (Besanko et al., 2009).

## **2.2 Diversification and performance**

Several studies investigate the correlation between diversification and performance, but they do not come to a consistent conclusion. Gort (1962) was one of the first to investigate this correlation. He defined diversification as the number of industries a company operates in combined with a specialisation ratio. This ratio is calculated as the output of a firm's main

industry to its total output. His analysis showed no cross-sectional correlation between diversification and profitability.

Arnould (1969) then extended the research of Gort (1962) by adding additional diversification measures, which aim to account for the market structure of the industries entered by a firm. Like Gort (1962), Arnould (1969) found no correlation between diversification and profitability. Furthermore, Markham (1973) investigated public policy implications of corporate diversification. In his analysis diversification was found to have a negative effect on profitability.

On the contrary, later research that used a different measure of diversification did find a positive correlation between diversification and profitability. Rumelt (1974) designed a categorical index that places firms in different categories of differentiation. The index takes the specialisation ratio and relatedness of industries into account. The specialisation ratio divides companies based on the fraction of revenues that the main industry in which the firm operates accounts for. The relatedness of industries is based on whether different product lines share core skills or resources. Besides, vertical integration is taken into account.

By introducing the categorical index as a measure for diversification, Rumelt (1974) was the first to distinguish different strategies of diversification in his analysis. While earlier research focussed on diversification in general without finding a significant correlation, Rumelt (1974) found a positive relationship between diversification and profitability using the nine categories created based on specialisation, relatedness and vertical integration.

The results show that profitability differs across different groups of firms that pursue different strategies of differentiation. Companies that diversify into industries that share core skills or resources with the industries in which they operated before, show to be the most profitable. On the other hand, firms that diversify in unrelated businesses or that were highly vertically integrated show to be the least profitable (Rumelt, 1974). Later, Rumelt (1982) replicated his earlier study. The results are in line with his previous findings. Moreover, he argues that factor based economics of scope are an important driver of these results.

Christensen and Montgomery (1981) extended the research of Rumelt (1974). They state that the results of the studies that define diversification based on the industrial organisation of a company are influenced by the environment a firm operates in. More specifically, they claim

that the market structure of the industry in which a firm operates or enters is moderating or confounding the relationship between diversification and profitability. In order to investigate this, they apply Rumelt's categorical diversification index combined with several market structure variables.

In line with the results of Rumelt (1974), the study shows a positive relationship between diversification and economic performance. As in the studies of Rumelt, economic performance is measured as the return on invested capital, which is defined as the net profit divided by the total assets. Besides, the results show relationships between market structure and diversification strategies (Christensen & Montgomery, 1981).

Subsequently, Palepu (1985) argues that the main cause of the inconsistency between the conclusions on the correlation between diversification and performance is the different methodologies used to measure diversification. He states that the fundamental difference between the different methodologies is that the studies of Gort (1962), Arnould (1969) and Markham (1973) fail to uncover the different profitability patterns of related and unrelated diversifiers. Since they define diversification as the industrial organisation of a firm's operations, these studies don't make a distinction between related and unrelated diversification. As Rumelt (1974, 1982) and Christensen and Montgomery (1981) show, this distinction is of great importance, because profitability highly differs between different diversification strategies.

Palepu (1985) therefore tried to combine the advantages of both diversification measures by using the entropy measure proposed by Jaquemin and Berry (1979). This measure is based on a firm's industrial organisation, but takes relatedness into account. However, neither a significant cross-sectional difference between the profitability of firms with high and low total diversification, nor a significant cross-sectional difference between the profitability of firms with mainly related and firms with mainly unrelated diversification are found.

In short, the studies that discuss the correlation between diversification and economic performance do not provide one consistent conclusion. Nevertheless, the studies provide useful implications on what factors drive the effects of diversification. However, even when factors that seem to drive the correlation, such as relatedness, specialisation and market structure are taken into account, the correlation remains ambiguous.



### **2.3 Diversification and market value**

Around the 1990's, research starts to focus on the correlation between diversification and market value, rather than it's correlation with performance. Lang and Stulz (1994) were among the first to investigate the effects on market value. They argue that market value is a better tool to investigate the effects of diversification than performance. Provided that diversification indeed creates value, under the assumption that the efficient market hypothesis holds, the market immediately reacts to fortunate performance prospects when a company announces to engage in diversification. This means that the additional value is incorporated in the market value of diversified firms. If diversified firms indeed have better performance prospects than specialized firms, diversified firms should on average have a higher market value.

However, their analysis shows a diversification discount. This means that diversified firms on average have a lower market value than specialized firms. Besides, highly diversified firms that operate in at least five different industries have a below sample average market value for all tested years (Lang & Stulz, 1994). This is in line with the results found by Rumelt (1974,1982) and Christensen and Montgomery (1981) on the performance of highly diversified businesses in unrelated industries.

In addition, even when the results are controlled for other factors that influence market value, the diversification discount is economically and statistically significant. The results are economically significant, because it implies that a diversified firm has a more than 10 percent lower market value than undiversified firms. Since diversified firms tend to be large, the effect is controlled for size. This reduces the diversification discount to some extent, but it remains sizeable. Similarly, industry effects explain part of the diversification discount, but they do not explain all of it. Overall, the diversification discount remains significantly present (Lang & Stulz, 1994).

Berger and Ofek (1995) confirm the existence of a diversification discount. In a large sample over the period 1986-1991, diversification is found to reduce market value 13 to 15 percent for firms of all sizes. However, the loss of value is smaller when the different industries the diversified firm operates in are related. Since market value incorporates future performance prospects ,this is in line with the findings of Rumelt (1974, 1982), who states relatedness has a positive effect on the performance of diversified firms.

Furthermore, Morck, Shleifer, and Vishny (1990) provide behavioural explanations for the diversification discount. They argue that managers consider both their personal interest in making an investment and the consequences for the market value of the firm. Investments focussed on long term growth, that provide managers with job security or that enable managers to spread the risk on their human capital are particularly interesting for the manager's private benefit. When private benefits are sizeable, managers might pursue them at cost of market value. Consequently, their results state that managers that performed poorly before the acquisition create a significantly higher discount.

Campa and Kedia (2002) however present evidence against the existence of a diversification discount. They claim that the choice of a firm to adopt a diversification strategy is likely to be a response to a change in the firms environment that also affects market value. In this case, diversification is an endogenous factor. The correlation between diversification and market value is therefore not causal. Once the analysis is controlled for exogeneous factors that predict a diversification strategy and for firm specific characteristics, diversification is more likely to be a premium. Contrary to the earlier studies, this would mean that diversification actually is a value adding strategy.

In light of the findings of Campa and Kedia (2002), Hoechle, Schmid, Walter, and Yermack (2012) conduct two analyses. The first analysis treats diversification as an exogeneous event. The second analysis treats diversification as an endogeneous event. Although the discount is smaller when diversification is treated as an endogenous event, both analysis find a significant diversification discount. Furthermore, as proposed by Morck et al. (1990), several corporate governance variables are included. In both settings, corporate governance explains a large part of the diversification discount. The reason for this is the tendency of bad managers to enhance their poor performance by pursuing a diversification strategy. However, they often fail accomplish this and instead destroy value rather than create it.

In conclusion, the studies that focus on market value show a diversification discount. Unrelatedness, industry effects and poor corporate governance appear to drive the discount. The fact that Campa and Kedia (2002) state that the discount can be completely explained by treating diversification as an endogenous factor, is later discredited by Hoechle et al. (2012). The overall conclusion of the studies that focus on market value is therefore that diversification generally results in a decrease of market value.

### III. Hypotheses

In this chapter the results found in earlier research are used to form implications and subjects of interest for this study. Consequently, these implications lead to the formation of the hypotheses that will be used to investigate the effects of diversification.

The diversification discount recurs throughout almost every market value focussed study. Lang and Stulz (1994) were among the first to state that diversified firms on average had a more than 10 percent lower market value than undiversified firms. Berger and Ofek (1995) consequently state that diversification reduces market value 13 to 15 percent. Campa and Kedia (2002) however argue that the diversification discount ceases to exist when diversification is treated as an endogenous variable, but these findings are later discredited (Hoechle et al., 2012). The diversification discount is therefore expected to still be present with recent data. Hence, the first hypothesis is:

*Hypothesis 1: 'Diversification by means of a merger has a negative effect on the bidding firm's market value'*

Furthermore, earlier studies define both technical and behavioural drivers of the diversification discount. Technical drivers are factors that result from characteristics of the type of acquisition or the diversifying firm. Firm size has a negative effect on Tobin's q and diversifying firms are generally large. Moreover, related acquisitions are found to result in a smaller loss of market value than unrelated acquisitions and industry effects are found to explain part of the discount as well (Lang & Stulz, 1994).

Behavioural drivers are factors that relate to the corporate governance of the diversifying firm. Bad managers are found to significantly increase the diversification discount in several studies. Managers may be prone to focus on private benefits rather than the firm's market value or try to enhance their already poor performance by pursuing a diversification strategy (Morck, Shleifer, & Vishny, 1990).

As a result, the diversification discount is expected to be driven by both technical and behavioural factors. These factors are divided into several hypotheses, because they are considered separate drivers of the diversification discount. The second hypotheses therefore are:

*Hypothesis 2.1: 'Unrelated diversification has a negative effect on a firm's market value'*

*Hypothesis 2.2: 'Firm size of diversifying firms has a negative effect on a firm's market value'*

*Hypothesis 2.3: 'Poor corporate governance has a negative effect on a firm's market value'*

In addition, the announcement effect of diversification on market value will be compared to the effect on long run performance. The efficient market hypothesis suggests that the announcement effect should be in line with the effect of diversification on economic performance in the years following the diversification. The studies that focus on performance however do not provide a consistent conclusion.

Since the studies that focus on market value consistently find a diversification discount, the efficient market hypothesis suggests a negative effect on long run performance for diversifying firms as well. A firm's future profit prospects are incorporated in the market value at the day of the announcement. This means that diversifying firms have poor future profit prospects compared to specialising firms (Lang & Stulz, 1994).

However, Rumelt (1982) and Christensen and Montgomery (1981) find that diversification increases long term profit if a firm diversifies into a related industry. Unrelated diversification on the other hand results in lower profits than both related diversification and specialisation. Besides, Berger and Ofek (1995) find similar effects for market value. When a company diversifies into a related industry, the diversification discount is smaller. Both the studies that focus on performance and the studies that focus on market value point out that different types of diversification have different effects. This means that the results found in the studies that focus on performance are actually in line with the efficient market hypothesis, when the different effects of different types of diversification are taken into account.

Consequently, different types of diversification are expected to have a different effect on long run performance. In line with the studies of Rumelt (1974, 1982), related diversification is expected to increase long run profits. Unrelated diversification on the other hand is expected to decrease long run profits. This results in the following hypotheses:

*Hypothesis 3.1: 'Diversification into a related industry by means of a merger has a positive correlation with the acquiror's long run performance.'*

*Hypothesis 3.2: 'Diversification into an unrelated industry by means of a merger has a negative correlation with the acquiror's long run performance.'*

## **IV. Data**

The dataset used to investigate the hypotheses is obtained from several databases. The sample of mergers and acquisitions is extracted from Thomson one. Mergers and acquisitions are defined as an acquiror that purchases more than fifty percent of the shares of a target in a single transaction. The dataset contains information about the mergers and acquisitions, such as the announcement date, the payment method, the deal value and the industries in which the target and acquiror operate.

The profits and the value of the total assets of the acquirors are obtained from COMPUSTAT North America. The output from both data sources are combined, which gives the acquirors' profits of the three years before and the three years after the announcement date. The stock price information of the acquiring firms is retrieved from DataStream.

### **4.1 Selection of data**

In order to create a consistent dataset several selection criteria are applied. First, both the target and the acquirer operate in the United States. This way noise from border crossing mergers is cancelled out. Second, the deal value is at least 10 million in order to cancel out acquisitions of too insignificant size to have an effect (Chang, 1998). Third, both the target and the acquirer are public companies.

This results in a sample of 327 mergers and acquisitions from the United States covering the period 2013-2015. However, it is necessary to omit several observations. Five acquisitions were spread over multiple purchases of less than fifty percent of the target's shares. These acquisitions were omitted because they don't comply to the definition of mergers and acquisitions used in this study. These mergers would cause noise in the results, because there is no clear announcement effect in either of the transactions. Only mergers in which more than 50 percent of the target's shares are acquired in a single transaction remain (Morck, Shleifer, & Vishny, 1990).

Moreover, as proposed by Morck et al. (1990), the dataset only entails completed mergers and acquisitions. The two withdrawn mergers are removed in order to avoid bias. Furthermore, 39 mergers are removed because of unavailability of data in COMPUSTAT North America. Therefore, the construction of several dependent as well as some of the independent variables is impossible for these mergers. Therefore, these mergers would only cause noise in the analysis.

## 4.2 Descriptive statistics

The resulting sample contains 281 mergers and acquisitions covering the period 2013-2015. Table I. contains descriptive statistics regarding the mergers and acquisitions. The top half of the table shows the distribution of the types of diversification and the payment method of the mergers. The sample contains 149 diversifying mergers of which 70 diversify into an unrelated industry and 79 diversify into a related industry. Besides, the sample contains 125 mergers that are financed with cash, 66 financed with stocks and 90 financed with a mix of cash and stocks.

The bottom half of table I. contains information about the size of the acquirors and the deal value of the mergers. The size of an acquiror is equal to the value of it's total assets in millions U.S. dollar at the announcement date. Acquirors in this sample on average have 17,730 million dollars of assets at the announcement date. The information about the deal values is also reported in millions U.S. dollar. The average deal value of the mergers is 2234 million dollar.

**Table I.**  
**Descriptive Statistics Mergers and Acquisitions**

This table reports descriptive statistics on completed mergers and acquisitions with both the target and acquiror based in the United States with available information on the total value of the deal. The data are obtained from Thomson one for all acquisitions announced and completed between 2013 and 2015. Reported values are in millions U.S. dollars. The amount of mergers of which the data of a variable was available is indicated by N. 'Appearances' indicates the number of appearances of a category of a categorical variable.

<b>Diversification</b>	<b>N</b>	<b>Appearances</b>			
Unrelated diversifying mergers	281	70			
Related diversifying mergers	281	79			
Specialising mergers	281	132			
<b>Payment</b>					
Cash payment	281	125			
Stock payment	281	66			
Hybrid payment	281	90			
<b>Characteristics</b>	<b>N</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>
Size acquiror	277	17,730	52,461	10,049	665,614
Deal value	281	2,234	4,738	10	48,082

## V. Methodology

### 5.1 Event study

In order to investigate the announcement effect of diversification on market value, an event study is performed. The announcement effect of related and unrelated diversifying mergers are compared to the announcement effect of specializing mergers. This way, it becomes clear whether the diversification discount is still present with recent data. The announcement date of the merger or acquisition is marked as the event date,  $t=0$ . Subsequently, the normal returns are estimated over a control period of 120 trading days. The control period covers  $t=-136$  until  $t=-16$ , because the returns in this period are not affected by the event yet. The announcement effect is investigated by calculating the abnormal returns over a test period covering  $t=-15$  until  $t=15$  (Travlos, 1987).

The presence of abnormal returns is determined by comparing the actual returns,  $R_{it}$ , to the expected returns in absence of a merger or acquisition,  $R_{it}^*$ . The expected returns are calculated by means of the market model. The parameters  $\alpha$  and  $b$  of the market model are estimated by performing the following regression on the control period:

$$R_{it} = a_i + b_i R_{MIT} + u_{it}$$

Consequently, the estimated  $\hat{a}_i$  and  $\hat{b}_i$  are inserted in the regression that estimates the normal returns in the test period:

$$R_{it}^* = \hat{a}_i + \hat{b}_i R_{MIT}$$

The abnormal returns in the test period can now be calculated by subtracting the expected returns from the actual returns:

$$ar_{it} = R_{it} - R_{it}^*$$

After computing the abnormal returns for every separate announcement, the average abnormal returns for each day of the test period are computed:

$$AR_t = \frac{1}{N} \sum_{i=1}^N ar_{it}$$

The average abnormal returns are then cumulated in order to derive the average cumulative abnormal returns, CAR. Abnormal returns are present if the CAR significantly differs from zero. The CAR is then used as a proxy for market value (Travlos, 1987). This is determined by means

of the Patell z-test. The advantage of this test is that it is immune to the way the AR's are distributed across the event window (Patell, 1976).

## 5.2 Variables

Besides the CAR as a proxy for market value, several other variables need to be constructed in order to investigate the effects of diversification on market value and performance. First, the construction of the dependent performance variables is discussed, followed by the construction of the independent variables.

Economic performance is measured as the return on invested capital, ROIC. The ROIC is calculated as the net income divided by the total assets of the firm over the corresponding year. This is the common measure for performance throughout literature, because it gives a company's performance relative to its size, which makes it possible to compare the performance of firms of different sizes. Some studies argue that the measure is more accurate when interest expenses are added to the net income before the computation of the ROI. However, this study does not follow this adjustment due to the unavailability of data on interest expenses (Rumelt, 1982).

Moreover, several independent variables are constructed. Diversification is classified based on the 4-digit industry SIC codes of the target and the acquiror. Each industry has a unique SIC code and related industries share the same first two digits of their codes. When the target and the acquiror share the same 4-digit SIC code, the merger is classified as specialising. This means that the acquiror does not diversify, but expands in the industry it already operates in. When the target and the acquiror share the same first two digits of their SIC codes but not the last two, the merger is classified as related diversification, since the acquiror diversifies into a related industry. When the target and acquiror don't share the first two digits of their SIC codes either, the merger is classified as unrelated diversification (Palepu, 1985).

The quality of corporate governance is measured as proposed by Morck et al. (1990). The acquiror's net income growth over the three years prior to the announcement date is used as a proxy for the quality of management. The net income growth is included relative to its industry average, since the industry component of performance is presumed to be out of the management's control. The three year income growth is calculated as  $(I(t-1) - I(t-4))/I(t-4)$ , where  $I$  is the net income and  $t$  is the year of the announcement. This three year income growth is then compared to the industry's average three year income growth. This yields the



relative three year income growth, which is used as the measurement of the quality of corporate governance.

Besides diversification and the quality of corporate governance, the acquiror's size, the payment method of the merger, the deal value and industry effects are included as independent variables. Size is measured as the total assets of the acquiring company at the announcement date. The payment method of the merger is divided into three categories. The first category consists of mergers that are completely financed with cash. The second category contains mergers that are completely stock financed and the third category includes mergers that are financed with a combination of cash and stocks (Travlos, 1987). The deal value is measured in millions of dollars and industry variables are added to control for industry specific effects.

### **5.3 Regressions**

The effect of diversification on market value and long run performance is investigated by means of several regressions including the constructed variables. First, the regression used to examine the announcement effect is discussed and the regressions used to investigate the correlation between diversification and long run performance follows.

In order to examine the correlation between diversification and market value, a regression analysis is performed with the CAR as the dependent variable and diversification as independent variable. Diversification is included as a dummy variable, which takes the value 1 if the merger classifies as either related or unrelated diversification and the value 0 if the merger classifies as specialising.

Besides, an interaction term is included to measure relatedness. The relatedness dummy takes the value 1 if the diversification is related and 0 if the diversification is unrelated. This relatedness dummy is multiplied by the diversification dummy, which means the effect of relatedness on the CAR is 0 when the diversification dummy is 0. This way, the interaction term shows the effect of related diversification compared to unrelated diversification.

Furthermore, the quality of corporate governance, the payment method, size, deal value and industry effects are included as independent variables. The quality of corporate governance is included as the industry relative value of three year income growth. Since the payment method consists of three categories, the payment method is included as two separate dummy

variables. One dummy takes the value 1 for stock financed mergers and the other dummy takes the value 1 for mergers financed with a combination of cash and stock. Therefore, the effects of these two dummies are relative to mergers financed with cash.

Size is included as the natural logarithm of the acquiror's total assets at the announcement date and deal value is included as the natural logarithm as well. This way, the effect of these variables are more clearly distinguishable. When all these variables are included, the following regression results:

$$CAR_{it} = \alpha_t + \beta_1 \text{Diversification}_{it} + \beta_2 \text{Diversification*Related} + \beta_3 \text{Governance} + \beta_4 \ln \text{Size} + \beta_5 \text{Stock payment} + \beta_6 \text{Hybrid payment} + \beta_7 \ln \text{Deal value} + e_{it}$$

Industry fixed effects are included in the analysis as well. These effects are measured with dummies for the different industries, which are relative to national commercial banks. In total 99 industry dummies are included.

The results of the regression that investigates the correlation between diversification and market value are compared to the results of the regressions that examines the correlation between diversification and long run performance. Three regressions are performed to investigate this effect. The acquiror's ROIC one year after the merger is the dependent variable of the first regression, the acquiror's ROIC two years after the merger in the second and the acquiror's ROIC three years after the merger in the third. This way the long run effect is measured at three points in time. The included independent variables are the same as in the regression that investigates the correlation between diversification and market value. As in the regression on the CAR, industry fixed effects are included as well.

$$ROIC = \alpha_t + \beta_1 \text{Diversification} + \beta_2 \text{Diversification*Related} + \beta_3 \text{Governance} + \beta_4 \text{Size} + \beta_5 \text{Stock payment} + \beta_6 \text{Hybrid payment} + \beta_7 \ln \text{Deal value} + e$$

Moreover, the error terms of observations that concern the same company, which occurs multiple times in the sample are assumed to be autocorrelated. Therefore, the observations are clustered by company TIC code in all regressions. Finally, Table VII., which is included in the appendix, contains descriptive statistics on all variables used in the regressions.

## VI. Results

This section contains the results that capture the effect of diversification on market value and economic performance. First, the results of the event study, which is used to investigate the short term effect of diversification on market value are discussed. In order to do this, first the abnormal returns are examined. Subsequently, the regressions with the abnormal returns as the dependent variable and diversification as the independent variable are examined. Thereafter, the results of the regressions that examine the effect of diversification on long run performance are discussed.

### 6.1 The effect of diversification on market value

**6.1.1 Cumulative abnormal returns.** In order to investigate the effect of diversification on market value, the cumulative abnormal returns (CAR) need to be evaluated first. The CAR is calculated for each day of the test period covering  $t=[-15,15]$ . Consequently, the Patell z-statistic is computed for each day, in order to determine whether the CAR significantly differs from zero at a significance level of 5%. This is the case when the z-value exceeds the critical value of 1,96.

Table II. contains the CAR's over the period  $t=[0,2]$ . As the table shows, these days exhibit significant abnormal returns around the announcement dates of the mergers. These abnormal returns are therefore presumed to capture the announcement effect of the mergers and acquisitions. In total, the average returns over the period  $t=[0,2]$  are 0,867% higher than the normal returns.

**Table II.**  
**Cumulative Abnormal Returns**

This table reports the cumulative abnormal returns over the period  $t=[0,2]$ . The stock prices are obtained from Datastream. The normal returns are calculated by means of the market model. The cumulative abnormal returns are reported in percentages. The Patell z-statistic is used to determine whether the abnormal returns significantly differ from zero. Z-statistics are reported in parentheses. \*, \*\*, and \*\*\* indicate significance at the 10%, 5%, and 1% level, respectively.

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**Acquiror**

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<b>Day</b>	<b>N</b>	<b>Cumulated Average Abnormal Return(%) (Patell z-value)</b>
<b>0</b>	268	0,262 *** (3,518)
<b>1</b>	268	0,381 *** (5,450)
<b>2</b>	268	0,223 *** (2,818)
<b>Total</b>	268	0,867 *** (6,805)

Furthermore, table VIII. containing all days of the test period is included in the Appendix. This table shows significant abnormal returns for  $t=8$  and  $t=13$  as well. These abnormal returns are however disregarded in the measurement of the announcement effect, because they show no consisted link to the event due to their isolated position.

**6.1.2 The regressions on the CAR over the period  $t=[0,2]$ .** Now that the presence of abnormal returns around the announcement dates of the mergers is established, the effects on these abnormal returns can be investigated. This section discusses the regressions with the CAR over the period  $t=[0,2]$  as the dependent variable.

Table III shows that diversification has no significant effect on the CAR in any of the regressions. The dummy, which takes the value 1 if the merger classifies as either related or unrelated diversification and the value 0 if the merger classifies as specialising remains insignificant regardless of the number of variables added to the regression. This means that there is no evidence in support of a negative effect of diversification on the CAR. Hypothesis 1: 'Diversification by means of a merger has a negative effect on the bidding firm's market value', is therefore not accepted.

Moreover, the technical factors defined in earlier research are included in the regressions. The interaction term that distinguishes related and unrelated diversification is insignificant in all regressions in which it is included. This suggests that related diversification has no other effect on market value than unrelated diversification. Besides, since the diversification dummy does not support a significant effect either, no effects regarding diversification are proven. There is

thus no evidence in support of hypothesis 2.1: 'Unrelated diversification has a negative effect on a firm's market value'.

On the contrary, the acquiror's size does show a significant effect on the CAR. Size is included as the natural logarithm of the acquiror's total assets at the announcement date. Table III. thus shows that a 1% increase in size results in a 1,13% decrease of the CAR. The validity of this effect is however debatable, since it is only significant at a 10% level. Nevertheless, this evidence supports hypothesis 2.2: 'Firm size of diversifying firms has a negative effect on a firm's market value'.

Furthermore, the behavioural factor that relates to the quality of the corporate governance of the acquirors is included. As table III shows, the quality of corporate governance has no effect on the CAR. Not only is the effect very small, it's also highly insignificant. Hypothesis 2.3: 'Poor corporate governance has a negative effect on a firm's market value', is therefore not accepted.

Finally, the payment method has a significant effect on the CAR. Both of the included dummies are significant at a 5% level. Payment with a mix cash and stocks results in 5.13% lower CAR than payment with only cash. In addition, payment with only stocks gives a 4.58% lower CAR than payment with only cash. These results are in line with the results of Travlos (1987), which state that cash payment has a positive effect on abnormal returns.

### **Table III.**

#### **Regression Analysis on the Determinants of the Cumulative Abnormal Returns**

The table shows estimates from regressions on a sample of mergers and acquisitions covering the period 2013-2015. The dependent variable is the CAR over the period  $t=[0,2]$ . In case a merger has incomplete information, that merger is excluded from the regression. Industry fixed effect are included as a total of 99 industry dummies, which are not shown. Standard errors are clustered by company TIC. The number of TIC clusters indicates the amount of different companies in the sample. The discrepancy between N and number of TIC clusters is caused by companies that appear multiple times. Heteroskedasticity-robust t-statistics are reported in parentheses. \*, \*\*, and \*\*\* indicate significance at the 10%, 5%, and 1% level, respectively.

Dependent Variable: CAR t=[0,2]				
	I.	II.	III.	IV.
N	268	268	255	253
Number of TIC clusters	229	229	216	215
<b>Variable</b>				
Intercept	.0006 (0.08)	.0017 (0.23)	.0030 (0.36)	.0976** (-2.51)
Diversification dummy	-.0005 (-0.04)	.0085 (0.40)	-.0060 (-0.26)	-.0055 (-0.25)
Relatedness dummy		-.0133 (-0.65)	-.0021 (-0.10)	-.0017 (-0.09)
Quality of Corporate Governance			.0005 (0.81)	.0007 (1.26)
LnSize				-.0113* (-1.85)
Hybrid payment dummy				-.0513** (-2.51)
Stock payment dummy				-.0458** (-2.05)
Ln Deal Value				.0090 (1.52)
Industry fixed effects included	Yes	Yes	Yes	Yes

## 6.2 The effect of diversification on future profits

In this section the effects of diversification on future profits are discussed. First, the determinants of the ROIC one year after the merger are discussed followed by the regressions on the ROIC two and three years after the mergers.

**6.2.1 The regressions on the ROIC 1 year after the merger.** Table IV shows that diversification has a significant effect on the ROIC one year after the mergers. Once more variables are added, the diversification dummy is significant at a 5% level. Besides, the effect is almost significant at a 5% level when all controls are included. The ROIC one year after the merger is approximately 3.6% higher for diversifying mergers than for specialising mergers.

Similarly, the interaction term that separates related and unrelated diversification has a significant effect. Initially the correlation is significant at a 5% level and when all controls are included the correlation is almost significant at a 5% level. Related diversification is found to decrease the ROIC one year after the diversification with approximately 4.3%. This implies that

the positive coefficient of the diversification dummy is due to the effect unrelated diversification. This is the opposite of what hypotheses 3.1 and 3.2 suggest.

Furthermore, the acquiror's size has a significant effect on the ROIC one year after the merger. As table IV shows, the ROIC increases 1.65% when an acquiror is 1% larger. This effect is significant at a 1% level. Besides, the ROIC one year after the merger is approximately 2.8% lower when the merger is financed with stocks compared payment with cash, but this effect is only significant at a 10% level. The quality of corporate governance on the other hand has no effect on the ROIC.

**Table IV.**

**Regression Analysis on the Determinants of the ROIC 1 Year After the Merger**

The table shows estimates from regressions on a sample of mergers and acquisitions covering the period 2013-2015. The dependent variable is the ROIC 1 year after the merger. In case a merger has incomplete information, that merger is excluded from the regression. Industry fixed effect are included as a total of 99 industry dummies, which are not shown. Standard errors are clustered by company TIC. The number of TIC clusters indicates the amount of different companies in the sample. The discrepancy between N and number of TIC clusters is caused by companies that appear multiple times. Heteroskedasticity-robust t-statistics are reported in parentheses. \*, \*\*, and \*\*\* indicate significance at the 10%, 5%, and 1% level, respectively.

	Dependent Variable: ROIC 1 year after the merger			
	I.	II.	III.	IV.
N	269	269	249	247
Number of TIC clusters	230	230	210	209
<b>Variable</b>				
Intercept	-.0044 (-0.40)	.0027 (0.30)	.0082 (1.30)	-.1081** (-2.45)
Diversification dummy	.0302 (1.18)	.0841* (1.77)	.0359** (1.97)	.0364* (1.91)
Relatedness dummy		-.0835** (-2.08)	-.0411* (-1.80)	-.0431* (-1.85)
Quality of Corporate Governance			.0002 (0.27)	.0001 (0.19)
LnSize				.0165*** (2.75)

Hybrid payment dummy					-0.0263 (-1.22)
Stock payment dummy					-0.0283* (-1.75)
Ln Deal Value					.0001 (0.01)
Industry fixed effects included	Yes	Yes	Yes	Yes	Yes

**6.2.2 The regressions on the ROIC 2 years after the merger.** As table V shows, the correlation between diversification and the ROIC ceases to exist two years after the merger. The diversification dummy is insignificant in all regressions regardless of the inclusion of other variables.

Similarly, table V shows that the interaction term that distinguishes related and unrelated diversification is no longer significant either. This implies that the effects of all types of diversification are no longer present two years after the merger. Therefore, there is no evidence supporting hypotheses 3.1 and 3.2 in the second year.

However, the acquiror's size still has a significant effect on the ROIC at a 5% level. When the acquiror is 1% larger at the announcement date, the ROIC two years after the merger is 1.01% higher. Besides, the payment method shows a clear significant correlation. Compared to payment in cash, payment with a mix of cash and stocks results in a 5.14% decrease of the ROIC two years after the merger and payment in stock in a 6.84% decrease of the ROIC. These results are significant at a 1% level.

Furthermore, the deal value of the merger shows a significant effect on the ROIC at a 5% level as well. If the deal value increases 1% the ROIC two years after the merger also increases with 1%. On the contrary, the quality of corporate governance has still no effect on the ROIC after two years.

**Table V.**

**Regression Analysis on the Determinants of the ROIC 2 Years After the Merger**

The table shows estimates from regressions on a sample of mergers and acquisitions covering the period 2013-2015. The dependent variable is the ROIC 2 years after the merger. In case a merger has incomplete information, that merger is excluded from the regression. Industry



fixed effect are included as a total of 99 industry dummies, which are not shown. Standard errors are clustered by company TIC. The number of TIC clusters indicates the amount of different companies in the sample. The discrepancy between N and number of TIC clusters is caused by companies that appear multiple times. Heteroskedasticity-robust t-statistics are reported in parentheses. \*, \*\*, and \*\*\* indicate significance at the 10%, 5%, and 1% level, respectively.

	Dependent Variable: ROIC 2 years after the merger			
	I.	II.	III.	IV.
N	252	252	233	232
Number of TIC clusters	218	218	199	198
<b>Variable</b>				
Intercept	.0104** (2.58)	.0096** (2.41)	.0085** (2.00)	-.0750* (-1.89)
Diversification dummy	-.0031 (-0.31)	-.0095 (-0.55)	-.0089 (-0.40)	-.0080 (-0.49)
Relatedness dummy		.0094 (0.52)	.0129 (0.58)	.0125 (0.74)
Quality of Corporate Governance			-.0001 (-0.06)	-0.0001 (-0.08)
LnSize				.0101** (1.97)
Hybrid payment dummy				-.0514*** (-3.21)
Stock payment dummy				-.0684*** (-3.23)
Ln Deal Value				.0100** (2.15)
Industry Fixed effects included	Yes	Yes	Yes	Yes

**6.2.3 The regressions on the ROIC 3 years after the merger.** Table VI shows that diversification has no correlation with the ROIC three years after the merger. The diversification dummy is insignificant in all regressions regardless of the number of included variables. This is in line with the results found on the ROIC two years after the merger.

Likewise, the interaction term that captures the effect of related diversification shows no significant effect either. Like the results found on the ROIC two years after the merger, there is no proof of any distinction between the effects of related or unrelated diversification, nor

between diversification and specialisation. There is thus no evidence that supports hypotheses 3.1 and 3.2 three years after the merger.

Furthermore, the acquiror's size at the announcement date no longer has a significant effect on the ROIC three years after the merger. The correlation between size and the ROIC found one and two years after the merger ceases to exist in the third year. Besides, the deal value has no longer a significant effect in the third year either.

On the contrary, the payment method again shows a significant correlation. Compared to payment in cash, payment with a mix of cash and stocks results in a decrease in ROIC of approximately 3.2%. This effect is almost significant at a 5% level. In addition, payment in only stocks results in a 3.22% decrease in ROIC compared to payment in cash, which is significant at a 5% level. The quality of corporate governance on the other hand again has no correlation with the ROIC.

**Table VI.**

**Regression Analysis on the Determinants of the ROIC 3 Years After the Merger**

The table shows estimates from regressions on a sample of mergers and acquisitions covering the period 2013-2015. The dependent variable is the ROIC 3 years after the merger. In case a merger has incomplete information, that merger is excluded from the regression. Industry fixed effect are included as a total of 99 industry dummies, which are not shown. Standard errors are clustered by company TIC. The number of TIC clusters indicates the amount of different companies in the sample. The discrepancy between N and number of TIC clusters is caused by companies that appear multiple times. Heteroskedasticity-robust t-statistics are reported in parentheses. \*, \*\*, and \*\*\* indicate significance at the 10%, 5%, and 1% level, respectively.

	Dependent Variable: ROIC 3 years after the merger			
	I.	II.	III.	IV.
N	154	154	142	142
Number of TIC clusters	137	137	125	125
<b>Variable</b>				
Intercept	.0163** (2.34)	.0148*** (2.71)	.0119** (2.19)	-.0245 (-0.68)
Diversification dummy	-.0172 (-1.07)	-.0370 (-0.98)	-.0434 (-0.95)	-.0357 (-0.85)

Relatedness dummy		.0273 (0.83)	.0381 (0.96)	.0306 (0.85)
Quality of Corporate Governance			.0005 (1.22)	.0005 (1.48)
LnSize				.0041 (0.73)
Hybrid payment dummy				-.0323* (-1.90)
Stock payment dummy				-.0322** (-2.29)
Ln Deal Value				.0063 (0.93)
Industry fixed effects included	Yes	Yes	Yes	Yes

In short, diversification only has a significant correlation with the ROIC in the first year after the merger. Similarly, the interaction term that distinguishes related and unrelated diversification is only significant in the first year after the merger. Moreover, the correlation found in the first year after the merger is opposite to what hypotheses 3.1 and 3.2 suggest. Related diversification decreases the ROIC rather than increases it. This implies that unrelated diversification increases rather than decreases the ROIC, since diversification in general has a positive correlation with the ROIC. Besides, these effects cease to exist in the second and third year after the merger. Hypothesis 3.1: 'Diversification into a related industry by means of a merger has a positive correlation with the acquiror's long run performance.' and hypothesis 3.2: 'Diversification into an unrelated industry by means of a merger has a negative correlation with the acquiror's long run performance.' can therefore not be accepted.

## VII. Conclusion

This section contains concluding remarks based on the results that are presented in the previous section. The determinants of both market value and future economic performance give useful insights on the effects of diversification and lead to the answer to the research question of this study:

*'To what extent does corporate diversification influence a firm's market value?'*

Diversification is found to have no significant correlation with market value. The results therefore provide no evidence that the diversification discount still exists. This contradicts the

findings of Lang and Stulz (1994) and Berger and Ofek (1995), who both state that diversification significantly decreases the acquiror's market value.

Besides, the distinction between related and unrelated diversification does not make a difference. Lang and Stulz (1994) and Berger and Ofek (1995) both find that diversification into a related industry decreases the diversification discount, which implies that related diversification has a positive effect relative to unrelated diversification. However, the results of this study show that related diversification has no other effect on market value than unrelated diversification.

On the contrary, diversification has a positive effect on the acquiror's economic performance one year after the merger. Besides, related and unrelated diversification have significant different effects. Related diversification is found to decrease the acquiror's profitability, while unrelated diversification has a positive effect. This contradicts the results of Rumelt (1978), who states that related diversification has a positive and unrelated diversification a negative effect on profitability.

The effect of diversification as well as the effect of relatedness on economic performance however ceases to exist in the second and third year after the merger. This means that diversification only has a short term impact on the acquiror's profitability.

In addition, the acquiror's size at the announcement date has a negative effect on its market value. This is in line with the results of Lang and Stulz (1994), who found that large acquirors show a bigger decrease in market value. The validity of the negative effect found in this study is however debatable, since it is only significant at a 10% level.

In fact, size has a positive correlation with economic performance one and two years after the merger. The fact that larger acquirors are more profitable in the years after the merger would provide evidence against the efficient market hypothesis. Size has a negative correlation with market value, which means that under the efficient market hypothesis, it should decrease future profits. Hence, the validity of the negative effect of size on market value, which is only significant at a 10% level, is unlikely.

Furthermore, the quality of corporate governance has no effect on the acquiror's market value. This behavioural driver, which was found by Morck et al. (1990), is therefore assumed to be unrelated to the announcement effect. This could however be caused by an insufficient

amount of firms per industry in the sample. Since the quality of corporate governance is included as the industry relative value of three year income growth, an insufficient number of firms per industry could bias the effect.

The corporate governance variable has a mean of 1. This could indicate that industries that only appear once in the sample are too numerous and therefore bias the effect. Further research with a larger number of firms per industry is therefore needed to verify that the quality of corporate governance indeed has no effect on market value. It should however be noted that the three year income growth has also been included in the regression as an absolute value rather than an industry relative value to test for different effects. This did not result in a significant effect either.

In addition, the results show that the payment method of a merger has a significant effect on both the market value and the future economic performance of the acquiror. Hybrid and stock payment result in a significantly lower market value than cash payment. This confirms the findings of Travlos (1987) and Loughran and Vijh (1997), who discovered the same effects for the different payment methods. Similarly, compared to cash payment, hybrid and stock payment significantly decrease profitability two and three years after the merger. This provides evidence in favour of the efficient market hypothesis, since the future decrease in profits is incorporated in the acquirors market value at the announcement date.

In conclusion, the reason for the disappearance of the diversification discount remains undiscovered. The different periods of the samples that were used in earlier research and the sample used in this study could provide a possible explanation. The samples used in earlier studies contain mergers performed in the second half of the 20<sup>th</sup> century. At that time the acquirors were mainly production firms with tangible assets. In the 21<sup>st</sup> century intangible assets have become more important due to technological advancements. This could cause a different announcement effect for mergers. However, further research is needed to identify the factors that cause the disappearance of the diversification discount.

Moreover, the results imply that in the 21<sup>st</sup> century, it is possible to exploit certain skills in unrelated industries. Unrelated diversification could create value, because it enables firms to make use of the internal capital market, while this was not possible in the second half of the 20<sup>th</sup> century. Besides, the potential for companies to achieve economies of scope could have

eroded over time. Related diversification significantly increased profitability in the second half of the 20<sup>th</sup> century, but now shows the opposite effect. Besanko et al. (2009) state that the potential for economies of scope is marginal in most industries in the 21<sup>st</sup> century. The reversal of the effects of related and unrelated diversification therefore needs further research.

## VIII. Appendix

Table VII.

### Descriptive Statistics Regressions

This table reports descriptive statistics on completed mergers and acquisitions with both the target and acquiror based in the United States with available information on the total value of the deal. The data are obtained from Thomson one for all acquisitions announced and completed between 2013 and 2015. Reported values are in millions U.S. dollars and the number of deals is indicated by N.

<b>Dependent variables</b>	<b>N</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>
CAR	268	.00867	.0687	-.3322	.2533
ROIct1	269	.00711	.1336	-1.847	.4854
ROIct2	252	.00825	.1334	-1.791	.3193
ROIct3	154	.01054	.0930	-.9292	.1161
<b>Independent variables</b>					
Diversification dummy	281	.53	.50	0	1
Relatedness dummy	281	.28	.45	0	1
Corporate Governance	258	1	6.353	-25.57	63.48
LnSize	277	8.283	1.768	2.307	13.308
Ln Deal Value	281	6.146	1.911	2.308	10.781
Hybrid payment dummy	281	.32	.47	0	1
Stock payment dummy	281	.23	.42	0	1

Table VIII.

### Cumulative Abnormal Returns

This table reports the cumulative abnormal returns over the period  $t=[-15,15]$ . The stock prices are obtained from Datastream. The normal returns are calculated by means of the market model. The cumulative abnormal returns are reported in percentages. The Patell z-statistic is used to determine whether the abnormal returns significantly differ from zero. Z-statistics are reported in parentheses. \*, \*\*, and \*\*\* indicate significance at the 10%, 5%, and 1% level, respectively.

**Acquiror**

<b>Day</b>	<b>N</b>	<b>Cumulated Average Abnormal Return(%) (Patell z-value)</b>	<b>Day</b>	<b>N</b>	<b>Cumulated Average Abnormal Return(%) (Patell z-value)</b>
-15	268	0,076 (1,251)	0	268	0,262*** (3,518)
-14	268	-0,100 (-0,681)	1	268	0,381*** (5,450)
-13	268	-0,052 (-0,534)	2	268	0,223*** (2,818)
-12	268	-0,073 (-1,188)	3	268	-0,222 (-1,224)
-11	268	0,036 (0,828)	4	268	0,044 (0,753)
-10	268	0,018 (-0,373)	5	268	0,101 (0,399)
-9	268	0,130 (1,129)	6	268	-0,067 (-0,875)
-8	268	-0,190* (-1,774)	7	268	-0,194 (-1,439)
-7	268	0,106 (0,650)	8	268	-0,155** (-2,165)
-6	268	-0,213 (-1,638)	9	268	-0,099 (-1,207)
-5	268	-0,023 (0,356)	10	268	-0,072 (-0,222)
-4	268	-0,031 (-0,107)	11	268	-0,009 (-0,340)
-3	268	-0,083 (-0,756)	12	268	-0,087 (-1,191)
-2	268	0,082 (1,090)	13	268	-0,284** (-2,111)
-1	268	0,021 (-0,220)	14	268	0,102 (0,785)
			15	268	0,001* (1,85)



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