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Exogenous Retirements of Directors due to Death and Their Successors

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Abstract

This paper analyzes the stock price reactions to exogenous retirements of directors due to death in conjunction with the appointment of their successors. The analysis is conducted with a data set of 1,560 death cases in 28 countries between 1996 and 2016. I find that the response of the stock price is very heterogeneous. On average capital markets respond negatively to exogenous departures of directors and this effect is more pronounced in non-USA countries. Nevertheless, the appointment of both a family relative and a director with an MBA, is associated with large and significant value gains at the time of a director's death.

Keywords: Capital markets, stock price reaction, exogenous departures, successors.

Zusammenfassung

In der vorliegenden Masterarbeit untersuche ich die Reaktion der Aktienmärkte auf den Tod eines Mitglieds im Board of Directors eines Unternehmens. Dabei beziehe ich insbesondere auch Informationen über mögliche Nachfolger des Vestorbenen in die Untersuchung ein. Die statistische Analyse stützt sich auf einen Datenbestand mit 1.560 Todesfällen aus 28 verschiedenen Ländern aus den Jahren 1996 bis 2016. Dabei ist zunächst festzustellen, dass die Reaktion der Aktienmärkte sehr heterogen ausfällt. Im Mittel führt der Tod eines Directors zu leichten Kursverlusten. Dieser Effekt ist außerhalb der USA deutlich stärker zu beobachten. Hingegen gehen sowohl die Ernennung eines mit dem Verstorbenen verwandten Nachfolgers, als auch eines Nachfolgers mit einem MBA-Abschluss mit erheblichen Kursgewinnen zum Zeitpunkt der Todesnachricht einher.

Schlüsselbegriffe: Kapitalmärkte, Reaktion der Aktienmärkte, exogene Ausscheiden, Nachfolger.

Table of Contents

List of Figures

List of Tables

List of Abbreviations

BX	BoardEx
CAR	Cumulative Abnormal Return
CEO	Chief Executive Officer
CFO	Chief Financial Officer
DS	DataStream
EBIT	Earnings Before Interest and Taxes
EDGAR	Electronic Data Gathering, Analysis, and Retrieval system
FTSE	Financial Times and Stock Exchange
MBA	Master of Business Administration
OLS	Ordinary Least Squares
ROA	Return on Assets
SEC	U.S. Securities and Exchange Commission
SIC	Standard Industrial Classification
TR	Thomson Reuters
USA	United States of America
WS	Worldscope

List of Symbols

$AR_{i,t}$	Daily abnormal return
$MAR_{i,t}$	Market-adjusted excess returns
$PR_{i,t}$	Predicted return
$R_{i,t}$	Stock return
$\hat{\alpha}_i$, $\hat{\beta}_i$	Estimated market model parameters
β	Regression coefficient for no information, age departing director, age successor, family, and MBA
α	Regression coefficient for size
γ	Regression coefficient for profitability
δ	Regression coefficient for leverage
ρ_i	Industry fixed effects
τ_i	Country fixed effects
φ_i	Year fixed effects
y_i	Dependent variable for the regressions
i	Observation, $i \in \{1, \dots, N\}$
t	Day from the event window

1. Introduction

Capital markets have become more and more popular over the last decades. Correspondingly, research interest into which factors drive capital market behavior has grown steadily. Among the topics that are currently in the focus of researchers is the question, how markets react to the exogenous departure of board directors.

One of the first things one observes when investigating the stock market reaction to exogenous departures, is its large heterogeneity. While in many cases the exogenous departure of a board member leads to a decline in the stock price, the opposite reaction is not uncommon at all. Therefore, it is of great interest to identify the factors that determine the stock market reaction.

Besides the objective of understanding and foreseeing how markets react to the exogenous departure of a board member, there is another motivation for investigating this type of events. In some cases the analyses permit us to make more general conclusions on how the market values certain characteristics in board directors. For example, if one finds that the market reacts on average more negatively to the departure of board members with a Master in Business Administration (MBA) opposed to board members with different educational backgrounds, one could infer that an MBA is valued more by the markets than other kinds of education.

Researchers have already examined a large variety of questions concerning the stock market reaction to the exogenous departure of a board member. However, many studies use limited data sets to investigate those questions, including, for instance, only Chief Executive Officer (CEO) deaths or only USA companies. In the present thesis, I will use a large data set that involves deaths of board members of all positions from a broad range of different countries. Hence, my first objective is to test whether the effects that have been described previously in the literature, can also be confirmed using this large, general data set. To cite one example, by analyzing deaths of CEOs in the USA, Jenter, Matveyev, and Roth (2017) find that the death of young CEOs is on average associated with firm value losses, whereas the death of old CEOs tends to lead to firm value gains, i.e., younger CEOs are more appreciated by shareholders compared to older CEOs. Following the same idea, I extend the study to deaths of

any board member in 28 different countries. Thereby verifying that this age effect is also present on capital markets when one considers a more general data set.

While trying to identify the dominant factors that decide the market reaction to exogenous departures of board members, the vast majority of researchers have focused on characteristics associated with the departing director. The second objective of the present study is to extend this research by also considering factors related to the successor of the deceased director. To this end, I assume that, at least in many cases, the most likely successor is already known to the investors on the date that the death is announced.

It should be noted that, like before, one can use characteristics found in successors to draw more general conclusions. Similarly to the example above, one could ask whether the education of the successor has an effect on the market reaction. More precisely, if one finds that the market reacts more positively to successors that hold an MBA opposed to those that do not, one then could infer that holding an MBA is appreciated by the investors.

In order to conduct the analysis, I employ a large data set considering 1,560 death cases in 1,419 firms from 28 different countries, between 1996 and 2016. This sample is built starting from a data set provided by the chair of Financial Management and Capital Markets, and includes many death observations and information about the departing director. Based on this sample, I then check on press releases and company filings to see whether the deceased director is replaced and, if so, I add the name of the successor and the announcement date to the sample. Finally, for those cases in which a successor is appointed, I manually collect personal information such as age, gender, and educational background, and add this information to the original data set. Once the information about the successor is completed, I use the database Thomson Reuters (TR) to collect the data about the firm performance that will be needed for the analysis. I then evaluate the stock market reaction following the death of a board director by using both cumulative market-model adjusted abnormal returns and cumulative market-adjusted excess returns.

For the purpose of checking the hypotheses of this thesis, two different statistical analyses are conducted. I first perform a univariate analysis to check which factors have a greater effect on the capital market’s reaction following a

director's death. After that, I conduct Ordinary Least Squares (OLS) regression analyses to further investigate the relation between the capital market's reaction and those factors that influences this reaction the most, according to the results obtained from the univariate analysis.

The present study about exogenous retirements of directors due to death is organized as follows. Section 2 provides an overview of the previous literature related with the topic of this thesis. Section 3 presents the main hypotheses of my studies. Section 4 is divided into two parts. In the first part, I describe the data collection procedure for both the successors and the financial performance. In the second part, the main statistics of the sample are presented to gain better knowledge of the study population. In Section 5, I explain the analyses that have been conducted and present the main results. I first conduct a univariate analysis through both the full sample and different sub-samples. After that, some further OLS regression analyses are carried out. Finally, I summarize the main results and conclude in Section 6.

2. Background and related literature

Many studies have been published in recent times about how the departure of members of the board of directors can influence the shareholder value and the firm performance. Most of the papers have focused on the departure of the CEO, thereby investigating a large variety of questions.

An important paper on this topic is the one by Jenter, Matveyev, and Roth (2017). Their study includes 458 cases of different firms from the USA that experienced the departure of a CEO due to death, between 1980 and 2012. From a general point of view, they first investigate whether stock markets react following the death of a CEO. They find that most sudden deaths are on average associated with a decrease in the firm value while non-sudden deaths involve an increase in the stock price. Delving deeper into their analysis, the authors find that the age and the tenure of the deceased CEO also have an influence on the capital market's reaction. More precisely, stock markets tend to react more positively with the departure of elderly CEOs, and CEOs with longer tenures. They conclude thereby, that the reaction of capital markets to a CEO departure can be very diverse. On the one hand, stock markets react on average negatively to sudden deaths of CEOs, especially if they are young and short-tenured. But, on the other hand, stock

markets tend to react positively to non-sudden deaths of CEOs, and to sudden deaths of old and long-tenured CEOs. In their paper, the authors also distinguish between two categories of CEOs: founders and non-founders. In this way, they find that the reaction on capital markets is much stronger when the departing CEO is also the founder of the firm, i.e., larger value gains following a sudden death of young and short-tenured CEOs, and larger value losses otherwise.

Similarly to the paper by Jenter, Matveyev, and Roth (2017), Limbach, Schmid, and Scholz-Daneshgari (2017), also evaluate the relation between the shareholder value and the tenure of the CEO using returns around the announcements of CEO deaths. They focus on the evolution of the firm value over the tenure of the CEO. The evidence in their paper suggests that the firm value tends to decrease with CEO tenure, especially when the CEO is not suited to changes. They additionally find that the start of this loss in the firm value depends on the dynamics of the industry, the entrenchment of the CEO, and how well the CEO is suited to changes. More concisely, the authors point out that the longer the CEO is in office and the more the firm dynamics change, the higher the probability that the quality of the CEO-firm match declines and, therefore, the higher the likelihood that the firm value falls.

In addition to the age and the tenure of the departing CEO, another important determinant of the firm value is the delay in the replacement, defined as the number of days between the announcement of the CEO's departure and the announcement of the new CEO. To cite a recent example, Rivolta (2017) studies whether the delay in appointing a new CEO after an unplanned CEO departure[1] can influence both the shareholder value and the firm performance. She employs a data set that involves 687 cases of CEO departures from 1995 to 2015 and finds that, on average, a delay in the replacement is beneficial for both the shareholder value and the firm performance. More accurately, she points out that this delay in the succession is especially important when there is no succession plan in the company. In fact, in those cases where the firm has a succession plan, she finds no significant difference in the firm's performance whether there is a delay or not.

[1] Rivolta considers unplanned CEO departure as either forced or unexpected departures. She considers a *forced* departure when "the ousting is preceded by poor firm and stock performance, disagreement between the CEO and the board, or is caused by activist pressure". She considers an *unexpected* departure when "the incumbent CEO departure is due to his or her unexpected death, illness, resignation, to unforeseen lawsuits and/or criminal investigations, or to being hired away by other public or private companies without prior notice". Rivolta (2017), p. 2.

However, when firms lack a succession plan, a delay in succession leads them to significantly outperform. Going one step further, the author argues that this beneficial effect of the delay stems from the assumption that, the longer the delay in the replacement, the higher the probability that the appointed CEO is a better match for the firm. Nevertheless, there are some exceptions. For instance, in firms with higher risk and stock volatility, the delay in the replacement is associated with negative effects on firm performance due to high uncertainty.

Like those mentioned before, many other aspects of the departure and succession process of CEOs have been thoroughly investigated. Fee, Hadlock, and Pierce (2013), for example, find that the managerial style plays an important role in company decisions and in the selection process of a new CEO. In addition, they point out that endogenous departures of CEOs are on average associated with larger abnormal policy changes, whereas there is no large change in the firm policy following the exogenous departure of a CEO. In another paper, Krigman, and Rivolta (2016) study the influence of firm directors on the rollover period from the departure of a CEO to the appointment of the new CEO. They conclude that, although inside directors are usually pointed out as being detrimental to monitoring effectiveness, thanks to their extensive experience and knowledge about the firm, they are more efficiently in searching for a new CEO, and can even assume the role of the CEO themselves. They additionally find that external, well-connected directors also play an important role when replacing the CEO, making the firm better suited to changes.

In connection with the paper by Krigman, and Rivolta (2016), Cvijanović, Gantchev, and Hwang (2017) also focus their study on the transition process between the departing CEO and the new CEO. In their paper, they concentrate on the benefits of having a formal succession plan for the efficiency of the CEO replacement procedure. The evidence of their analysis suggests that succession plans are not only beneficial because they reduce the uncertainty following the departure of the CEO, but also because they increase the stability of the management by reducing the probability of a forced CEO replacement. In addition, the authors point out that, although there is a negative correlation between succession planning and CEO entrenchment, appointing independent directors may diminish this effect.

Besides this extensive literature about the influence of CEOs in both the shareholder value and the firm performance, there is also a great interest in analyzing the influence of independent directors on those variables. For instance, Dahya, Dimitrov, and McConnell (2006) study whether the board composition has an effect on the firm value. More precisely, their study focuses on firms with dominant shareholders, using a sample of 799 firms from 22 different countries. They find that a large proportion of independent directors on the board leads to an increase in the firm value, being the relation between company value and proportion of independent directors even more pronounced in countries with weak legal shareholder protection. Based on their results, the authors suggest that it would be possible for dominant shareholders to increase the firm value by appointing more independent directors.

Another relevant paper about the relation between independent directors and shareholder value is the one by Nguyen, and Nielsen (2009). In their paper, they evaluate the influence of independent directors on the firm value by analyzing the capital market reaction following the sudden death of a director. Their sample includes 229 sudden death cases in the USA between 1994 and 2007, from which 108 observations correspond to independent directors. They find that capital markets react negatively to the departure of an independent director, which suggests that independent directors are generally appreciated by shareholders. The authors infer that this beneficial effect of independent directors to firm value stems from the assumption that, as experienced professionals, they place value on their own reputation and, in addition, they are not subject to agency problems that prevents them from monitoring effectively. So as to compare the variation in stock prices between different directorships, they additionally investigate the stock price reaction following the death of both an inside and a gray director[2]. Thereby finding that the stock market's reaction tends to be more negative following the death of an independent director as opposed to the death of an inside or a gray director.

Although most of the existing literature focuses on either the influence of CEOs or the influence of independent directors on the company's behavior and

[2] Nguyen, and Nielsen define *inside directors* as "current employees of the firm" and *gray directors* as "board members who are retired employees of the firm, relatives of the CEO, or persons with conflicts of interest or related to the firm's business". Nguyen, and Nielsen (2009), p. 554.

performance, there are also papers that extend their analysis to other board members. For instance, Bertrand, and Schoar (2003) evaluate how different managers can influence the firm performance and strategy. With this purpose, they divide the managers into three groups, i.e., Chief Executive Officers (CEOs), Chief Financial Officers (CFOs), and others, and they find that, for example, the influence of CEOs on the corporate strategy is much larger than the influence of CFOs. They also analyze whether the managers' characteristics have an effect on the firm behavior, thereby finding that, from a financial perspective, older CEOs tend to be more conservative while, managers with an MBA are committed to more aggressive strategies.

Another important determinant of the firm value that has been widely discussed is the external connection between directors and management. Fracassi, and Tate (2012) analyze whether, following the departure of a director due to death, the capital market's reaction varies depending on pre-existing ties between the new director and the management. In their study, they consider a great variety of possible pre-existing network connections. To mention some examples, they check whether the new director and the CEO have studied the same MBA program, they work or have worked together in another company, they belong to the same country club, or whether they are involved in the same charity organization. Given all this, they find that external network connections between new directors and management are on average associated with a negative effect on firm value. As the authors explain in their paper, CEO-connected directors are more likely to accept proposals made by the CEO so as not to lose their valuable external connection with the CEO and endanger possible promotion opportunities in their professional career. All of this leads not only to firm value losses when a CEO-connected director is appointed, but also to firm value gains when this CEO-connected director leaves the company. Furthermore, they point out that the more powerful the CEO, the higher the number of CEO-director ties in the company. In other words, powerful CEOs tend to take advantage of their influence to appoint a board of directors that pursues their own objectives.

In addition to the already described aspects that influence the firm value, another issue that is currently in discussion is the discrimination between men and women. In a recent paper, Schmid, and Urban (2017) investigate whether stock markets react differently following the departure of a female board member in

comparison with the departure of a male board member. Based on the results of their analysis, they find that women are underrepresented on boards of directors. Consequently, out of the 2,849 exogenous departures included in their sample, only 94 cases are associated with women departures. The authors also find that, following an exogenous departure of a director, stock market reaction tends to be more negative, when the departing director is a woman. They argue that these effects are not necessarily directly related to the gender of the directors, but to their level of preparation. Due to the existing discrimination, it becomes much more difficult for women to enter on a company board and, therefore, the female board members will be on average more prepared and qualified than their male peers, thereby leading to an increase in firm value. They also point out that the share of women on the board of directors varies a lot across the countries and that fewer women on the board lead to more negative reaction on stock markets following the departure of a female board member. However, the authors point out that these effects cannot be observed, when women are appointed to the board because of family ties.

3. Development of hypotheses

As described in the previous section, there is plenty of literature about how the shareholder value and the firms' performance change following the departure of a director from the board. In this paper, I want to investigate this topic further. More precisely, this study focuses on the capital market's reaction to the exogenous departure of directors due to death. Special attention will be given to the role of their successors in this reaction. The hypotheses of the present paper are:

Hypothesis I suggests that there is an effect on capital markets following the exogenous departure of a director due to death. This hypothesis is the baseline of the present study. As explained before, I first check whether there is a reaction on capital markets when a board director dies using announcement returns around a director's death. Based on the result obtained from this analysis, I then investigate which are the determinants for this reaction. As this thesis focuses on successors, I will additionally test whether there is also a reaction on the stock market around the official announcement of the successor.

Hypothesis II suggests that independent directors are beneficial for the shareholder value. As mentioned in the previous section, the results in the paper by Nguyen, and Nielsen (2009) already suggested that independent directors have beneficial effects for shareholders and, therefore, stock prices tend to decrease following the death of an independent director. Inspired by this paper, I now extend the analysis to an international context and to a larger number of observations. In addition, I do not only check whether stock prices decline after an independent director's death, but also if the appointment of an independent director leads to an increase in the shareholder value, thereby further testing the beneficial effect of independent directors.

Hypothesis III suggests that stock markets react differently depending on the age of both the departing director and the successor. In a recent paper based on USA companies, Jenter, Matveyev, and Roth (2017) report that the death of old CEOs are associated with firm value gains, while the death of young CEOs are associated with firm value losses. Taking their findings as the baseline, I investigate this beneficial effect of young directors on the firm value by analyzing the effect of both, the death and the appointment of a young director. The main differences with the paper by Jenter, Matveyev, and Roth (2017), are that I do not only consider the death of CEOs, but the death of any board member, and I conduct the analysis across 28 countries considering a larger number of observations.

Hypothesis IV suggests that the period between the announcement of a director's death and the announcement of the successor influences the capital market's reaction. Rivolta (2017) already pointed out that the delay in the replacement has a positive effect on capital markets. By following the same line of research, I extend the study to a larger data set across different countries and, I consider not only the death of CEOs, but the death of any board member. However, I focus my analysis to death cases and do not include departures due to illness, resignation and forced dismissals.

Hypothesis V suggests that the reaction on stock markets varies depending on whether the appointed successor is internal or external[3]. When a director dies, the board of directors can decide whether to elect either an internal director or an

[3] In this thesis, I assume that the successor is *internal* when he was already part of the company at the appointment date and *external* otherwise.

external director. At first sight, it seems that both options could bring benefits to the company, e.g. the former has a better knowledge of the firm and the turnover would be easier while, the latter could bring new ideas to the company that lead to an increase in the firm's performance. During the analysis, I will compare the effects on capital markets in both cases to check whether they differ from each other or not.

Hypothesis VI suggests that the appointment of a successor that has family ties with the departing director influences the capital market's reaction differently to the appointment of other directors. It is well known that in some cases the departing director is replaced by a family relative, which could be seen as both an advantage or as a disadvantage. On the one hand, a family relative could represent a sign of continuity and stability, which could be very appreciated by the investors. On the other hand, some investors may prefer to elect another director that enters the board by their own professional merits and not because of family ties. In this thesis, I calculate the capital market reaction in both cases and I then compare them, thereby verifying whether the appointment of a successor with family ties influences the reaction on capital markets around the announcement of the director's death or not.

Hypothesis VII suggests that the educational background of the successor has an effect on the shareholder value. The large data set prepared for this thesis involves a large number of directors with different kinds of education. On this basis, I will compare the reaction on stock markets depending on which university degree the successor holds, thereby identifying, for instance, whether an MBA is more valued by shareholders over other university degrees.

Hypothesis VIII suggests that capital markets react differently depending on whether the departing director is replaced or not. Following the departure of a director due to death, the majority of firms tend to search for a new director that can assume the functions of the deceased director. However, in some cases, the board decides not to replace the position of the departing director, thus, for example, reducing the board size. In Section 5, I check whether this decision of replacing or not the deceased director influences the capital market's reaction around the death's announcement.

Hypothesis IX suggests that the number of directors on the board has an effect on the stock market's reaction following the death of a director. The board size differs widely from one firm to another. Therefore, it may occur that, for firms with fewer directors, the death of a director leads to a stronger stock price reaction compared to those firms with a large number of directors. In this thesis, I split the sample according to the board size and I then compare the effect of a director's death on the shareholder value in each case.

Hypothesis X suggests that there is a different effect on capital markets depending on whether information about the succession is provided or not. As explained in Section 1, I start the data collection from a large data set with many death observations and, I then search for the successor in press release and company filings. However, in about half of the cases there is no information available regarding the succession of the deceased director. On this basis, I also test whether this lack of information has an effect on the shareholder value.

For the purpose of evaluating the stock market reaction, I will use returns around the announcement of the director's death to test all the hypotheses listed above.

4. Data

For the analysis of the stock price reaction to exogenous departures of directors due to death, a lot of data needs to be collected. In this section, I first explain in depth how I proceed to collect the data for both the successors and the financial performance. I then present the descriptive statistics of the sample obtained.

4.1. Data collection procedure

The data collection is the largest part of this project due to the high importance of the data for the analysis and the large amount of sources and information needed.

I start the data collection procedure from a data set provided by the chair with many death observations in different countries. This data set contains information about both the firms that experienced an exogenous departure of a director, and the departing director. From this baseline, I search for the successors and I then collect the financial data needed for the analysis.

4.1.1. Successors

The process of searching for the successors involves several steps that can be clustered in two main categories. The first one consists in researching whether the departing director is replaced or not and, if so, finding out the name of the successor. Whenever a successor is found, I proceed with the second category that consists in collecting more information about him, e.g. age, gender, education, or previous firm.

To obtain information about the succession, I start with a thorough search of news around the date of the director's death. In the first instance, I check on the databases Nexis and Factiva to see whether there are any press releases that announce the successor for the departing director. If no information is found this way, I additionally search for the company filings on either the companies' websites or the database Company Filings via Thomson One Banker. For the USA, I also use the search tool Electronic Data Gathering, Analysis, and Retrieval system (EDGAR) from the U.S. Securities and Exchange Commission (SEC). Finally, in the cases where I find the successor, I add not only his name to the sample, but also the announcement date, making sure to take the first, exact date the successor is made known.

The next step consists in collecting information about the successors found. I first search on the database BoardEx (BX) for personal details and both educational and professional background. After that, I complete the missing information using the database Officers and Directors through Thomson One Banker.

The results of the search are summarized in Table 1. It reports the number of observations for each country, the share of successors found, the share of departing directors that are not replaced, and the share of no information found. I present these values for the full sample and for each country considered.

More than half of the observations considered in this sample are from the USA. In such cases, the departing directors are replaced in 40.8% of the observations, whereas in 44.4% of the cases, no information about the succession plan has been found. For the non-USA countries, the share of no information found is higher (59.6% of the observations) due to the very little information about the succession found for countries such as Canada, Hong Kong, and

Australia, in which the share of no information found is higher than 65%. It is also noteworthy, that in countries such as Germany, Switzerland, Netherlands, and Ireland, a successor is found in more than half of the cases. However, the number of observations for these countries is much smaller than for the previously mentioned countries and, therefore, their effect on the total share of no information found is lower.

Table 1
Statistics for the countries

This table reports statistics for the different countries considered in the sample. Successor represents the share of successors found. No successor represents the share of deceased directors that are not replaced. No information found represents the share observations, in which no information about succession is provided. Sources: database provided by the chair, company filings, and press releases.

Countries	N	Successor	No successor	No information found
United States of America	818	40.8%	14.8%	44.4%
Non-USA Countries	742	34.9%	5.5%	59.6%
United Kingdom	182	35.7%	8.8%	55.5%
Canada	127	18.9%	0.8%	80.3%
Hong Kong	86	23.3%	0.0%	76.7%
Australia	79	26.6%	6.3%	67.1%
Italy	29	44.8%	6.9%	48.3%
Germany	27	55.6%	7.4%	37.0%
Japan	27	33.3%	7.4%	59.3%
Switzerland	21	66.7%	4.8%	28.6%
France	21	33.3%	19.0%	47.6%
Netherlands	20	60.0%	10.0%	30.0%
Sweden	16	43.8%	6.3%	50.0%
Spain	11	45.5%	0.0%	54.5%
Portugal	10	50.0%	0.0%	50.0%
Ireland	10	70.0%	0.0%	30.0%
Finland	9	44.4%	11.1%	44.4%
Turkey	9	33.3%	0.0%	66.7%
Austria	8	62.5%	12.5%	25.0%
Russia	8	62.5%	0.0%	37.5%
Israel	8	37.5%	12.5%	50.0%
Cyprus	7	14.3%	0.0%	85.7%
Denmark	7	85.7%	0.0%	14.3%
Norway	6	33.3%	16.7%	50.0%
Belgium	5	40.0%	20.0%	40.0%
Poland	4	0.0%	0.0%	100.0%
Luxembourg	3	66.7%	0.0%	33.3%
Greece	1	100.0%	0.0%	0.0%
Hungary	1	100.0%	0.0%	0.0%
TOTAL (28 countries)	**1,560**	**38.01%**	**10.38%**	**51.60%**

To sum up, at the end of this process, a total of 1,560 exogenous retirements of directors due to death have been researched. Thereby finding that, 593 of the departing directors had successor, while 162 did not. The share of information found for the full sample is 48.40%, i.e., in almost half of the cases, there is no information available about the succession.

4.1.2. Financial performance

Once the information about the successors is collected, I search for the financial data on both the Worldscope (WS) and the DataStream (DS) database from Thomson Reuters.

In the first place, I download the Standard Industrial Classification (SIC) code from the Worldscope database. This static variable is collected for each firm so that I can afterwards classify the companies according to the Fama/French five industry classification.

Secondly, I collect the main financial variables from the Worldscope database. For instance, I download total assets, market capitalization, earnings before interest and taxes, and net sales or revenue. All these variables are downloaded on an annual basis for each firm and are used to describe the companies considered in the present thesis.

Table 2
Thomson Reuters WorldScope and DataStream codes

This table summarizes the codes used in TR. Sources: WS and DS.

Code	Description
Worldscope	
WC07021	SIC Code 1
WC07230	Total Assets (U.S.$)
WC07210	Market Capitalization (U.S.$)
WC18191	Earnings Before Interest and Taxes (EBIT)
WC01001	Net Sales or Revenues
WC03255	Total Debt
WC07011	Employees
DataStream	
RI	Total Return Index
pch#(X(RI)~U$,-1d)	FTSE All World (AWWRLD)
pch#(X(RI)~U$,-1d)	Daily % of the Return Index

Thirdly and lastly, I search on the DataStream database for both the stock returns for each firm and the Financial Times and Stock Exchange (FTSE) All

World index return. In this case, the variables are downloaded on a daily basis from 1995 to 2018 to cover all the observations included in the sample. Table 2 reports the Worldscope and DataStream codes for all the variables used in this study.

4.2. General sample statistics

After collecting all the data, I conduct a descriptive analysis to gain better knowledge of the study population of this thesis.

The sample used for the analysis includes a total of 1,560 exogenous departures of directors due to death. The causes of death for the mentioned directors are reported in Table 3. As shown in this table, the most common causes of death are illness, cancer, and heart attack, although in most of the cases, the death causes are undisclosed.

Table 3
Cause of death

This table summarizes the causes of death for the directors. Source: database provided by the chair.

Cause of death	Number of events
Undisclosed	577
Illness	234
Cancer	153
Heart attack	61
Natural causes	33
Accident	31
Stroke	6
Suicide	5
Complications from surgery	5
Murder / Hostage	4
Consequences of a specified disease	3
Renal failure	3
Cardiac problems	3
Aneurysm	2
Consequences of an injury	1
Infection	1
Pneumonia	1
Cerebral issues	1
Total	**1,124**
Sudden Death	**56.4%**
No Sudden Death	**43.6%**

The previous table additionally reports the share of sudden and non-sudden deaths. The sample used comprises 56.4% sudden death observations, which means that there were no indications of health problems for the departing directors before the death date. Figure 1 shows the most common causes of sudden deaths. Among all these cases, more than half of the causes are undisclosed but, besides that, heart attack and accidents are the most common examples of sudden death. In Figure 1, the group Others includes causes of sudden deaths such as strokes, suicides, and murders.

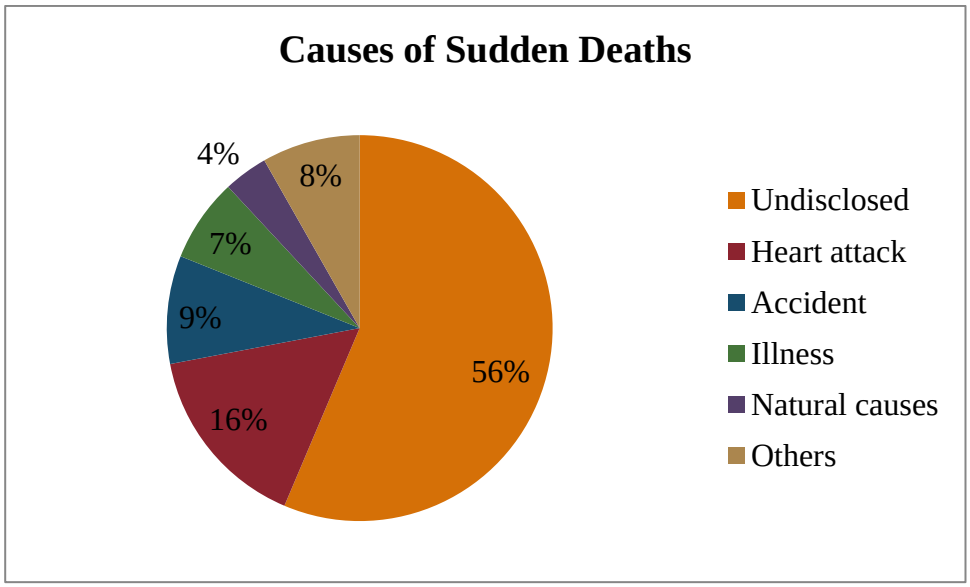

Figure 1: Causes of sudden deaths

This figure reports the main causes of sudden deaths. Source: database provided by the chair.

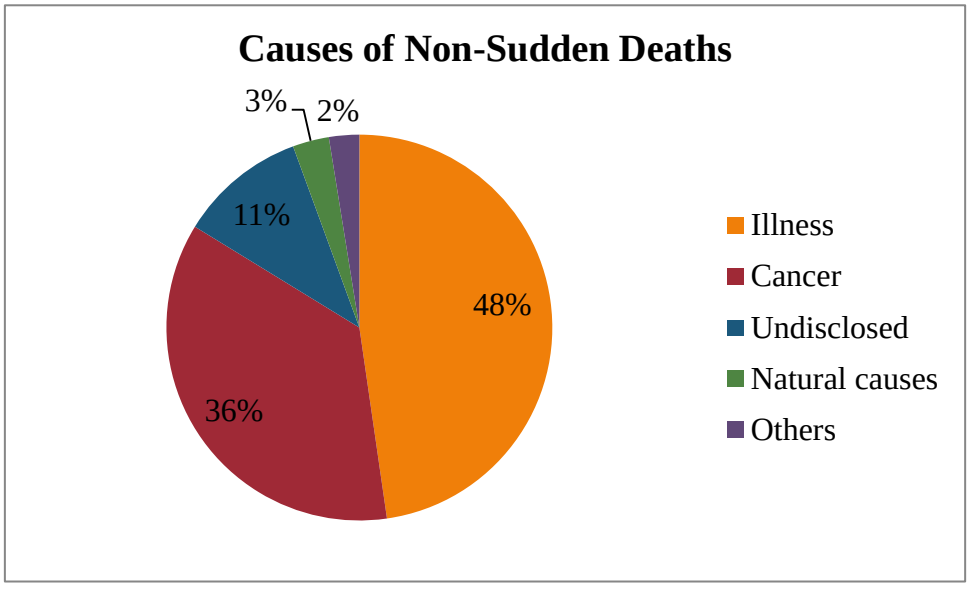

Figure 2: Causes of non-sudden deaths

This figure reports the main causes of non-sudden deaths. Source: database provided by the chair.

In contrast, Figure 2 shows the most common causes of non-sudden deaths. Illness and cancer are by far the most common causes of non-sudden deaths. In Figure 2, the group Others includes renal failure and consequences of a specified disease.

As described in Section 4.1.1, out of the 1,560 death cases considered, I find the successor for 593 departing directors. Tables 4a and 4b summarize the main statistics for the sample used in this thesis. As shown in Table 4a, the vast majority of the successors are men, and only 11.8% of them are women. Concerning the educational level, 71.0% of the successors hold a bachelor degree but only 21.1% possess an MBA. I also find that half of the successors are internal, i.e., they were already working at the company at the time of their appointment. In addition, the table shows that 10.6% of the departing directors are replaced by a family relative, being the father-son connection the most common family tie in this sample.

Table 4a
Descriptive Statistics: Successors

This table summarizes the main statistics for the successors in the sample used in this thesis. Gender represents the share of men in the board. Education reports the percentages of successors that hold a certain university degree. Successor internal represents the share of the successors that were already part of the firm at the appointment date. Successor relative reports the share of the successors that have a family tie with the deceased director. Sources: company filings, press releases, and BX.

	All		Chairman		Independent Chairman		Independent director		CEO	
Variable	N	%	N	%	N	%	N	%	N	%
Successor characteristics										
Gender (1=male)	593	88.2%	175	92.0%	56	98.2%	268	85.8%	69	94.2%
Education										
Bachelor degree	593	71.0%	175	60.6%	56	76.8%	268	82.8%	69	69.6%
Postgraduate degree	593	25.6%	175	22.3%	56	28.6%	268	30.2%	69	20.3%
MBA	593	21.1%	175	14.9%	56	33.9%	268	26.1%	69	18.8%
PhD	593	16.2%	175	12.0%	56	25.0%	268	19.0%	69	8.7%
Successor internal	563	50.1%	167	89.2%	56	91.1%	263	21.7%	68	95.6%
Successor relative	593	10.6%	175	22.3%	56	5.4%	268	1.5%	69	43.5%

Table 4b reports the main characteristics for the directors, the firm and the board. The average age of the departing directors is 68.8 years. As expected, the departing directors are older than their successors and this difference is on average around ten years. The mean of total assets and the mean of market capitalization

for the firms considered are 8,862.88 and 4,748.51 million $, respectively. All these firms have on average about nine directors on their boards.

Table 4b
Descriptive Statistics: Directors, firm, and board

This table summarizes the main statistics for directors, firms and boards included in the sample used in this paper. Age deceased director and age successor represent the age of the respective director at the event date, i.e., death announcement and successor's announcement. Age deceased directors only considers the observations in which the deceased director is replaced. Total assets, market capitalization, earnings before interest and taxes (EBIT), sales, and total debt are in $ millions. Market capitalization represents the total market value of the company. Sales represents net sales or revenue. Total debt is all interest bearing and capitalized lease obligations. Return on assets (ROA) is the quotient between EBIT and total assets. Book leverage is the quotient between total debt and total assets. Employees is the number of both full and part time employees at the event year. Financial variables are winsorized annually at the 1% and 99% level. Board size refers to the number of directors on the board the year before and the year after the death. Delay in replacements represents the number of days between the announcement of the death and the announcement of the successor. Sources: company filings, press releases, BX, and WS.

Variable	N	Mean	25^{th} percentile	50^{th} percentile	75^{th} percentile	Standard deviation
Director characteristics						
Age deceased director	521	68.8	62.0	69.0	75.0	10.4
Age successor						
All	506	57.8	52.0	58.0	64.0	8.7
Chairman	146	57.8	52.0	58.0	64.0	8.4
Independent Chairman	52	64.0	58.0	62.5	71.0	7.8
Independent director	245	58.1	54.0	58.0	64.0	8.1
CEO	59	55.0	49.0	54.0	61.0	8.0
Firm characteristics						
Total assets	1,385	8,862.88	77.86	503.44	2,848.18	31,715.62
Market capitalization	1,371	4,748.51	61.00	373.12	2,216.93	14,328.05
EBIT	1,347	2,693.35	-0.25	32.08	261.80	16,853.51
Sales	1,387	20,684.17	41.16	426.84	2,474.90	133,124.70
Total debt	1,156	15,756.34	15.95	207.00	1,287.70	104,444.86
ROA	1,346	0.12	-0.004	0.057	0.128	1.10
Book leverage	1,382	0.83	0.026	0.183	0.379	3.48
Employees	1,273	12,138.77	209.0	1,453.0	7,450.0	31,095.32
Board characteristics						
Board size before death	751	9.1	7.0	8.0	11.0	3.9
Board size after death	770	8.5	6.0	8.0	10.0	3.8
Delay in replacement						
All	335	71.5	5.0	42.0	111.0	82.3
Chairman	105	43.7	1.0	14.0	55.0	69.2
Independent Chairman	35	26.8	0.0	8.0	27.0	47.6
Independent director	152	104.7	30.5	84.5	163.0	86.7
CEO	40	41.1	1.5	14.5	51.5	62.7

The delay in the replacement is on average 71.5 days, but it varies a lot between the groups. As it is shown in this table, 25% of the chairmen and independent chairmen are appointed on the same day or, at most, the day after the

announcement of death. This is not the case for independent directors[4]. On average, independent directors are appointed 104.7 days after the announcement of the death and only 25% of them are appointed during the first month after the departure.

5. Empirical analysis

In this section, I analyze the effect of the death of a director and their successors on the shareholder value in order to check the hypotheses described in Section 3. Section 5.1 shows the results of a univariate analysis of the capital market reaction around the announcement of the exogenous departure of a board director due to death. Section 5.2 reports the main findings of several OLS regression analyses for those factors that most influences the stock market's reaction after a board member's death.

5.1. Univariate analysis

As explained before, one of the objectives of this thesis is to study whether there is an effect on capital markets following the exogenous departure of a director due to death (see *Hypothesis I*). After that, I search for explanations to these stock price reactions based on the characteristics related to both the departing director and the successor, thereby investigating the remaining hypotheses.

With this in mind, I first study the stock price reaction around the announcement of a director's death in Section 5.1.1. Secondly, in Section 5.1.2, I repeat the same analyses through several sub-samples to find how the characteristics of both the departing director and the successor influence this reaction of the capital markets.

5.1.1. Cumulative abnormal returns: Full sample

In this section, I present abnormal returns and cumulative abnormal returns for the days around the announcement of a director's death to check whether there is an effect on the capital market when a director dies. The announcement date is defined as the first date the death is made known through either a press release or a company filing.

[4] It is interesting to note, that a t-test for the difference in means between the delay in replacement for chairman and for independent directors yields significance at p-value$<10^{-8}$.

Table 5 summarizes abnormal returns for five days before and after the announcement of a director's death. I refer to this time period as the event window.

Table 5
Abnormal returns around director's deaths[5]

This table shows abnormal returns for the days around the announcement of a director's death (t=0), i.e., the first date the death is made known through either a press release or a company filing. Panel A summarizes market-model adjusted abnormal returns, obtained by subtracting predicted returns from stock returns. I estimate the predicted returns using a market model based on the window [-230, -30] before the announcement of the director's death. Firms with less than 100 return observations in this window have not been considered. The FTSE All World index return has been used as market benchmark. Panel B summarizes market-adjusted excess returns, obtained by subtracting FTSE All World index return from stock returns. Abnormal returns are winsorized daily at the 1% and 99% level. The *p*-values for means are calculated using robust standard errors. The *p*-values for medians are based on quantile regressions. The markers ***, **, * indicate significance at the 1%, 5% and 10% level, respectively. Sources: company filings, press releases, and DS.

Panel A: Market-model adjusted abnormal returns

Event time (trading days)	Mean	*p*-value	Median	*p*-value	25th percentile	75th percentile	Standard deviation	% events positive returns
-5	-0.05%	0.608	-0.11% *	0.066	-1.29%	0.97%	3.44%	46.98%
-4	-0.15%	0.105	-0.11% **	0.047	-1.17%	0.95%	3.23%	46.74%
-3	0.06%	0.504	-0.03%	0.514	-1.22%	1.07%	3.25%	48.75%
-2	0.07%	0.476	-0.08%	0.183	-1.24%	1.14%	3.45%	48.17%
-1	-0.07%	0.464	-0.08%	0.109	-1.25%	0.95%	3.18%	47.40%
0	-0.05%	0.598	-0.06%	0.249	-1.32%	0.97%	3.27%	48.23%
1	-0.20% *	0.060	-0.13% **	0.039	-1.33%	1.08%	3.56%	47.36%
2	-0.03%	0.728	-0.03%	0.579	-1.17%	1.04%	3.36%	49.62%
3	0.02%	0.836	-0.02%	0.685	-1.16%	1.03%	3.13%	48.61%
4	-0.13%	0.197	-0.11% **	0.026	-1.23%	0.97%	3.44%	47.03%
5	-0.07%	0.475	-0.13% ***	0.008	-1.22%	0.99%	3.39%	46.48%

Panel B: Market-adjusted excess returns

Event time (trading days)	Mean	*p*-value	Median	*p*-value	25th percentile	75th percentile	Standard deviation	% events positive returns
-5	0.01%	0.954	-0.06%	0.293	-1.22%	1.08%	3.29%	48.20%
-4	-0.08%	0.398	-0.07%	0.215	-1.22%	1.06%	3.12%	46.48%
-3	0.10%	0.284	-0.09%	0.113	-1.21%	1.22%	3.15%	48.05%
-2	0.12%	0.211	-0.03%	0.633	-1.18%	1.26%	3.35%	48.64%
-1	0.02%	0.781	-0.05%	0.332	-1.20%	1.05%	3.04%	48.76%
0	0.03%	0.746	-0.04%	0.489	-1.34%	1.06%	3.17%	48.48%
1	-0.07%	0.479	-0.10% *	0.080	-1.29%	1.18%	3.39%	47.26%
2	0.07%	0.433	0.01%	0.848	-1.09%	1.13%	3.22%	50.08%
3	0.08%	0.372	0.05%	0.396	-1.19%	1.13%	3.10%	51.18%
4	-0.09%	0.347	-0.10% *	0.058	-1.25%	1.08%	3.34%	47.26%
5	-0.02%	0.814	-0.10% *	0.090	-1.22%	1.09%	3.29%	46.80%

Panel A of Table 5 reports daily market-model adjusted abnormal returns, calculated as the difference between stock returns and predicted returns, that is:

[5] This table is inspired by Table 3 in the paper by Jenter, Matveyev, and Roth (2017), p. 29.

$$AR_{i,t} = R_{i,t} - PR_{i,t} \quad (1)$$

where $AR_{i,t}$ represents the daily market-model adjusted abnormal returns, $R_{i,t}$ is the stock return, $PR_{i,t}$ is the predicted return, the index $i \in \{1, \dots, N\}$ represents the observation, and the index t is a day from the event window.

I estimate predicted returns using a market model based on the window [-230, -30] trading days before the announcement of a director's death. I exclude firms with less than 100 return observations in this window. For this estimation, the FTSE All World index return has been used as a market benchmark. Therefore, the predicted returns are built as follows:

$$PR_{i,t} = \hat{\alpha}_i + \hat{\beta}_i \cdot R_{m,t} \quad (2)$$

where $PR_{i,t}$ is predicted return, $R_{m,t}$ is the FTSE All World index return, $\hat{\alpha}_i$ and $\hat{\beta}_i$ are the market model parameters estimated with data for the window [-230, -30] before the death's announcement, and the indices i and t are defined as before.

Panel B of Table 5 presents market-adjusted excess returns around the announcement of a director's death. In this case, abnormal returns are calculated as the difference between stock returns and FTSE All World index returns, that is:

$$MAR_{i,t} = R_{i,t} - R_{m,t} \quad (3)$$

where $MAR_{i,t}$ represents the daily market-adjusted excess returns, $R_{i,t}$ is the stock return, $R_{m,t}$ is the FTSE All World index return, the index $i \in \{1, \dots, N\}$ represents the observation, and the index t is a day from the event window.

In Table 5, both the market-model adjusted abnormal returns and the market-adjusted excess returns around the announcement of a director's death are very close to zero, with some positive and some negative values. The level of statistical significance[6] of these results is generally very weak. However, I obtain a significant negative abnormal return the day after the announcement date. On that day, the mean of the market-model adjusted abnormal return is -0.20% and the median is -0.13%, which are significant at the 10% and 5% level, respectively.

[6] For simplicity, I say that a result is statistically significant, when it is statistically significantly different from zero, if not stated otherwise.

The median of the market-adjusted excess returns the day after the announcement is also negative and equals -0.10%, significant at the 10% level. These results suggest that following an exogenous departure of a director due to death, capital markets tend to react negatively and stock prices on average drop.

In order to compare these effects with the effects around the announcement of the successor, I summarize in Appendix 1 abnormal returns for the days around the announcement of a successor's appointment. Panel A of Appendix 1 reports daily market-model adjusted abnormal returns, calculated as the difference between stock returns and predicted returns. In this case, predicted returns are also estimated using a market model based on the window [-230, -30] trading days before the announcement of a director's death. The difference with the results in Table 5 is that stock returns are from the days around the announcement of the successor and not around the death announcement. Panel B of Appendix 1 shows market-adjusted excess returns around the announcement of the successor. The results in Appendix 1 are also close to zero and lack generally statistical significance.

The results based on daily abnormal returns from Table 5 are too weak to draw a strong conclusion. Therefore, I next look at results based on event windows around the announcement date. I calculate cumulative abnormal returns (CAR), which are built as the sum of single day returns over an event window beginning one or two days before the event and ending some days later.

Panel A of Table 6 reports the results for cumulative market-model adjusted abnormal returns, for different event windows. Although the results are not statistically significant for every event window included in Table 6, the general pattern becomes very clear. For all event windows I get negative means, some of them at statistically significant levels. The effects are more pronounced, the more days after the event date are included in the window. Similarly, the medians of the sample are negative for all event windows. The results here show often an even higher level of statistical significance. For instance, the average cumulative abnormal return for the event window [-1,+5] is -0.52%, with a median of -0.29%. Both are statistically different from zero at a significance level of 5%.

However, it is noteworthy, that almost half of the observations have positive returns following the announcement of a director's death. In later sections, I

conduct several analyses to identify the factors that may lead to a positive reaction on the capital markets when a director dies.

Table 6
Cumulative abnormal returns around director's death[7]

This table shows cumulative abnormal returns around the announcement of a director's death (t=0), i.e., the first date the death is made known through either a press release or a company filing. Panel A summarizes cumulative market-model adjusted abnormal returns obtained as the sum of market-model adjusted abnormal returns. Panel B summarizes cumulative market-adjusted excess returns obtained as the sum of market-adjusted excess returns. Abnormal returns are winsorized daily at the 1% and 99% level. The *p*-values for means are calculated using robust standard errors. The *p*-values for medians are based on quantile regressions. The markers ***, **, * indicate significance at the 1%, 5% and 10% level, respectively. Sources: company filings, press releases, and DS.

Panel A: Cumulative market-model adjusted abnormal returns

Event time (trading days)	Mean	*p*-value	Median	*p*-value	25th percentile	75th percentile	Standard deviation	% events positive returns
[-2, +1]	-0.16%	0.384	-0.18%	0.118	-2.51%	2.11%	6.16%	47.53%
[-2, +2]	-0.15%	0.462	-0.17%	0.177	-2.81%	2.27%	6.89%	47.70%
[-2, +3]	-0.15%	0.485	-0.19%	0.140	-2.88%	2.66%	7.43%	48.18%
[-2, +4]	-0.33%	0.152	-0.32% **	0.016	-3.40%	2.78%	7.98%	46.83%
[-2, +5]	-0.43% *	0.087	-0.21%	0.141	-3.56%	3.02%	8.57%	48.18%
[-1, +1]	-0.25%	0.109	-0.25% ***	0.009	-2.40%	1.70%	5.44%	46.34%
[-1, +2]	-0.24%	0.177	-0.25% **	0.025	-2.44%	2.07%	6.25%	46.42%
[-1, +3]	-0.25%	0.207	-0.24% *	0.051	-2.73%	2.23%	6.78%	47.62%
[-1, +4]	-0.43% **	0.047	-0.28% **	0.016	-3.09%	2.28%	7.45%	46.22%
[-1, +5]	-0.52% **	0.025	-0.29% **	0.034	-3.49%	2.63%	8.04%	47.06%

Panel B: Cumulative market-adjusted excess returns

Event time (trading days)	Mean	*p*-value	Median	*p*-value	25th percentile	75th percentile	Standard deviation	% events positive returns
[-2, +1]	0.18%	0.267	-0.04%	0.747	-2.13%	2.17%	5.65%	49.53%
[-2, +2]	0.30% *	0.099	0.06%	0.611	-2.51%	2.53%	6.20%	50.17%
[-2, +3]	0.35% *	0.070	0.18%	0.170	-2.60%	3.00%	6.65%	51.98%
[-2, +4]	0.20%	0.335	0.11%	0.427	-2.91%	3.27%	7.07%	51.16%
[-2, +5]	0.14%	0.508	0.09%	0.457	-3.14%	3.34%	7.44%	50.73%
[-1, +1]	0.03%	0.830	-0.12%	0.218	-2.15%	1.82%	4.99%	47.82%
[-1, +2]	0.15%	0.370	-0.02%	0.929	-2.31%	2.09%	5.63%	49.71%
[-1, +3]	0.20%	0.260	0.06%	0.568	-2.43%	2.58%	6.07%	50.96%
[-1, +4]	0.05%	0.807	0.01%	0.878	-2.72%	2.70%	6.61%	50.30%
[-1, +5]	-0.01%	0.969	-0.03%	0.889	-3.02%	3.10%	7.03%	50.18%

Panel B of Table 6 presents cumulative market-adjusted excess returns, obtained as the sum of market-adjusted excess returns. In this case, I get on average positive cumulative excess returns for almost every event window, which seems rather surprising when comparing with the results in Panel A. This change from negative to positive in means could be explained by the observation that

[7] This table is inspired by Table 4 in the paper by Jenter, Matveyev, and Roth (2017), p. 30.

cumulative market-adjusted excess returns are on average higher than cumulative market-model adjusted abnormal returns and, as said before, the abnormal returns in this sample are close to zero. Furthermore, the results in Panel B of Table 6 are very weak and most of them lack statistical significance.

In addition, I also calculate cumulative abnormal returns for different event windows around the announcement of a successor's appointment. The results shown in Appendix 2 suggest that capital markets tend to react positively following the appointment of the successor. However, no strong conclusion can be drawn due to the lack of statistical significance. Panel A of Appendix 2 presents positive cumulative market-model adjusted abnormal returns, but none of the results show statistical significance. Panel B of Appendix 2 reports cumulative market-adjusted excess returns. In this case, the results are even more positive and with a stronger level of statistical significance compared to the results in Panel A, but they still do not reach the 10% level of statistical significance.

Lastly, I split the sample into USA and non-USA countries and I calculate cumulative market-model adjusted abnormal returns for both groups. Consistent with the results in Table 6, cumulative market-model adjusted abnormal returns around the announcement of a director's death are on average negative for both groups.

As shown in Table 7, cumulative abnormal returns are negative for both groups, but in this case, the results for the USA lack statistical significance. In contrast, for the non-USA countries I find significant negative median cumulative abnormal returns for the majority of the time windows considered. To cite an instance, the average cumulative abnormal return for non-USA countries over the time windows [-1,+4] and [-1,+5] are -0.69% and -0.79%, respectively. Both are significant at the 5% level. The medians cumulative abnormal returns for non-USA countries over all the event windows starting one trading day before the announcement date are between -0.34% and -0.48%, all of them significant at the 5% or even at the 1% level.

When comparing the results for the USA with the results for the non-USA countries for the corresponding windows, a questionable statistical significance appears. The results suggest that the values for the USA are higher and, therefore, more positive than for non-USA countries. For the event window [-1,+4], it is

almost significant that the average cumulative abnormal return for the USA is higher than for non-USA countries (the *p*-value groups equals 0.106). However, none of the results break the 10% significance level.

Table 7
Cumulative abnormal returns: USA vs. non-USA Countries

This table shows cumulative market-model adjusted abnormal returns around the announcement of a director's death, obtained as the sum of market-model adjusted abnormal returns. The announcement date (t=0) is the first date the death is made known through either a press release or a company filing. Panel A summarizes cumulative market-model adjusted abnormal returns for the USA. *p*-values groups are based on one-sided difference-in-means test between USA and non-USA countries for the corresponding event window. Panel B summarizes cumulative market-model adjusted abnormal returns for non-USA countries. Abnormal returns are winsorized daily at the 1% and 99% level. The *p*-values for means are calculated using robust standard errors. The *p*-values for medians are based on quantile regressions. The markers ***, **, * indicate significance at the 1%, 5% and 10% level, respectively. Sources: company filings, press releases, and DS.

Panel A: Cumulative market-model adjusted abnormal returns for USA

Event time (trading days)	Mean	*p*-value	Median	*p*-value	Standard deviation	N	*p*-value groups
[-2, +1]	-0.02%	0.933	-0.07%	0.684	6.56%	570	0.238
[-2, +2]	-0.08%	0.801	-0.10%	0.576	7.19%	570	0.366
[-2, +3]	-0.04%	0.913	0.04%	0.856	7.76%	570	0.304
[-2, +4]	-0.03%	0.943	-0.05%	0.912	8.37%	570	0.102
[-2, +5]	-0.11%	0.774	0.18%	0.511	8.97%	570	0.110
[-1, +1]	-0.15%	0.529	-0.12%	0.326	5.56%	570	0.259
[-1, +2]	-0.20%	0.448	-0.15%	0.373	6.28%	570	0.406
[-1, +3]	-0.16%	0.577	-0.17%	0.275	6.82%	570	0.332
[-1, +4]	-0.15%	0.636	-0.15%	0.438	7.51%	570	0.106
[-1, +5]	-0.23%	0.495	-0.06%	0.722	8.10%	570	0.115

Panel B: Cumulative market-model adjusted abnormal returns for Non-USA Countries

Event time (trading days)	Mean	*p*-value	Median	*p*-value	Standard deviation	N
[-2, +1]	-0.28%	0.232	-0.31% **	0.044	5.76%	618
[-2, +2]	-0.21%	0.423	-0.22%	0.192	6.60%	618
[-2, +3]	-0.26%	0.370	-0.32%	0.107	7.13%	618
[-2, +4]	-0.61% **	0.045	-0.48% ***	0.009	7.61%	618
[-2, +5]	-0.72% **	0.029	-0.59% ***	0.002	8.18%	618
[-1, +1]	-0.35%	0.102	-0.34% **	0.017	5.33%	618
[-1, +2]	-0.29%	0.254	-0.35% **	0.016	6.23%	618
[-1, +3]	-0.33%	0.224	-0.37% **	0.042	6.75%	618
[-1, +4]	-0.69% **	0.021	-0.47% ***	0.006	7.39%	618
[-1, +5]	-0.79% **	0.014	-0.48% ***	0.008	7.99%	618

To sum up, regarding the first hypothesis presented in Section 3, I conclude that there is on average a significant negative response of capital markets to exogenous departures of director due to death, as intuitively expected due to the loss of experience and the uncertainty. Moreover, the evidence suggests that this effect is more negative and more significant for non-USA countries.

5.1.2. Cumulative abnormal returns: Sub-samples

As seen in the previous section, capital markets react to exogenous departures of directors due to death. In this section, I calculate cumulative abnormal returns for several sub-samples to identify the characteristics of both the departing director and the successor that influence the stock price's reaction when a director dies. For all the tables in this section, I use cumulative market-model adjusted abnormal returns over the event window [-1,+1] around the announcement of a director's death.

So as to verify the second and the third hypotheses presented in Section 3, I split the sample firstly, according to the independence of the director, and secondly, according to the age terciles of the directors. The cumulative abnormal returns for each sub-sample are presented in Table 8.

Panel A of Table 8 summarizes the results obtained when considering the independence and the age of the departing directors. Due to the lack of statistical significance, no conclusion is drawn when an independent director dies. However, I find a significant negative median cumulative abnormal return when a non-independent director dies. In this case, the median equals -0.25% and it is significant at the 5% level, which coincides with the results obtained for the full sample. Furthermore, the *p*-value obtained for difference in means between independent and non-independent directors is very high (the *p*-value groups equals 0.881) i.e., no statistically significant difference in means between the groups is found.

I then split the sample into the age terciles for the deceased directors. The cumulative abnormal returns are on average negative for all the age terciles, but only the results for the second tercile are statistically significant. When the deceased director is between 64 and 73 years old, the average cumulative abnormal return is -0.45%, which is significant at the 5% level and more negative than the return obtained for the full sample (-0.25%).

Next, I repeat the same calculations, but this time taking into account the independence and the age of the successors. Panel B of Table 8 presents the cumulative abnormal returns around the announcement of a director's death for the observations in which a successor is found.

Table 8
Cumulative abnormal return: Independence and age terciles[8]

This table shows cumulative abnormal returns for the event window [-1, +1], where t=0 is the announcement date of a director's death, i.e., the first date the death is made known through either a press release or a company filing. Cumulative abnormal returns are obtained as the sum of market-model adjusted abnormal returns. Abnormal returns are winsorized at the 1% and 99% level. The *p*-values for means are calculated using robust standard errors. The *p*-values for medians are based on quantile regressions. The *p*-value groups is obtained by testing difference in means between independent and non-independent directors, and between the first and the third age tercile. The markers ***, **, * indicate significance at the 1%, 5% and 10% level, respectively. Sources: company filings, press releases, BX, and DS.

Panel A: Cumulative Abnormal Returns Around Director's Death: Independence and Age Terciles for Deceased Directors

Category	Mean	*p*-value	Median	*p*-value	N	*p*-value groups
Full simple	-0.25%	0.109	-0.25% ***	0.009	1188	
Independent Director	-0.21%	0.477	-0.26%	0.192	301	0.881
Non-Inpendent Director	-0.26%	0.159	-0.25% **	0.033	885	
Deceased director age tercile						
First tercile: Age < 64 Years						
Full sample	-0.37%	0.257	-0.28%	0.186	285	0.404
Second tercile: Age between 64 and 73 years						
Full sample	-0.45% **	0.050	-0.27%	0.104	421	
Third tercile: Age > 73 Years						
Full sample	-0.01%	0.975	-0.14%	0.381	482	

Panel B: Cumulative Abnormal Returns Around Director's Death: Independence and Age Terciles for Successors

Category	Mean	*p*-value	Median	*p*-value	N	*p*-value groups
Full simple	0.06%	0.794	-0.18%	0.237	485	
Independent Director	-0.06%	0.817	-0.10%	0.836	272	0.547
Non-Inpendent Director	0.22%	0.582	-0.30%	0.301	213	
Successor age tercile						
First tercile: Age < 55 Years						
Full sample	0.48%	0.305	0.14%	0.740	141	0.074
Second tercile: Age between 55 and 62 years						
Full sample	0.08%	0.834	-0.09%	0.762	153	
Third tercile: Age > 62 Years						
Full sample	-0.26%	0.496	-0.53% **	0.013	191	

[8] This table is inspired by Table 5 in the paper by Jenter, Matveyev, and Roth (2017), p. 31.

I first split the sample into independent and non-independent successors but, this way, the cumulative abnormal returns obtained lack statistical significance. Nevertheless, a general pattern becomes clear when I split the sample into the age terciles for successors: the younger the successor, the more positive the reaction on capital markets to exogenous departures of directors. Due to the lack of statistical significance, it cannot be concluded that stock prices react positively when a young successor is appointed. However, there is a clear difference in average cumulative abnormal returns between the first and the third age tercile, which is significant at the 10% level (the *p*-value groups equals 0.074). In fact, the cumulative abnormal return for the third age tercile has a large and negative median (-0.53%), which is significant at the 5% level.

In short, the evidence suggests that, regarding *hypothesis II*, there is no difference in the stock price reaction whether an independent or a non-independent director dies. For the successors, no statistically significant effect on capital markets is found when considering the independence of these directors. With respect to *hypothesis III*, there seems to be no clear pattern for the age terciles of departing directors, but it is noteworthy that the cumulative abnormal returns for middle-aged departing directors are more negative than for the full sample. However, in regard to age of the successors, the results suggest that younger successors lead to a more positive effect on stock prices than older successors, thus providing some evidence in terms of *hypothesis III*.

Jenter, Matveyev, and Roth (2017) already pointed out that younger CEOs are more appreciated by shareholders and, therefore, capital markets tend to react more negatively following the death of a young CEO. In this case, I do not get a clear pattern over the age terciles for deceased directors due to the lack of statistical significance. However, I observe a pattern over the age terciles for successors, i.e., the younger the successor, the more positive the effect on capital markets, which is consistent with the assumption of Jenter, Matveyev, and Roth (2017). In Section 5.2, I conduct several regression analyses to investigate further the relation between the age of both the departing director and the successor, and cumulative abnormal returns following the exogenous departure of a director due to death, thereby providing further evidence to these assumptions.

Turning to another issue, *hypothesis IX* suggests that the board size at the time of death could also have an influence on the stock price reaction. To this end,

I now calculate cumulative abnormal returns around a director's death over the different board size terciles. After that, I cluster the observations into different sub-samples depending on whether the board size decreases, increases or remains the same. The results are summarized in Table 9.

Panel A of Table 9 presents cumulative abnormal returns for the board size terciles. I obtain large and negative cumulative abnormal returns for boards with less than 7 directors and for boards with more than 9 directors. The average cumulative abnormal returns are -0.55% and -0.43%, respectively. However, none of the results achieve the 10% level of statistical significance.

Table 9
Cumulative abnormal return: Board Size

This table shows cumulative abnormal returns for the event window [-1, +1], where t=0 is the announcement date of a director's death, i.e., the first date the death is made known through either a press release or a company filing. Cumulative abnormal returns are obtained as the sum of market-model adjusted abnormal returns. Abnormal returns are winsorized at the 1% and 99% level. The *p*-values for means are calculated using robust standard errors. The *p*-values for medians are based on quantile regressions. The *p*-values groups is obtained by testing difference in means between the first and the third board size tercile, and between a reduction and an increase in the board size. The markers ***, **, * indicate significance at the 1%, 5% and 10% level, respectively. Sources: company filings, press releases, BX, and DS.

Panel A: Cumulative Abnormal Returns Around Director's Death. Board Size Before Death.

Category	Mean	*p*-value	Median	*p*-value	N	*p*-value groups
First tercile: Board size < 7 Directors						
Full sample	-0.55%	0.239	-0.09%	0.813	142	0.635
Second tercile: Board size between 7 and 9 directors						
Full sample	0.01%	0.976	-0.11%	0.586	306	
Third tercile: Board size > 9 directors						
Full sample	-0.43%	0.149	-0.26%	0.326	163	

Panel B: Cumulative Abnormal Returns Around Director's Death. Change in the Board Size.

Category	Mean	*p*-value	Median	*p*-value	N	*p*-value groups
Reduction in the board size						
Full sample	-0.31%	0.281	-0.26%	0.207	317	0.564
No change in the boad size						
Full sample	-0.04%	0.869	-0.04%	0.813	220	
Increase in the board size						
Full sample	-0.68%	0.242	-0.50%	0.271	73	

As shown in Panel B of Table 9, in about half of the cases, firms reduce the board size after the exogenous departure of a director due to death (N=317). It should be noted here that, in this case, N represents the number of death

observations for which the board size experiences a reduction and, in addition, there is stock data available for both the estimation and the event window. It seems that, on average, cumulative abnormal returns tend to be large and negative for a reduction and an increase in the board size. Nevertheless, these means do not break the 10% significance level. To put it briefly, it is not possible to assert the ninth hypotheses due to the lack of statistical significance in the results obtained.

As the last step in this section, I divide the sample in several sub-samples to test the remaining hypotheses, that is, hypotheses IV, V, VI, VII, VIII, and X. The cumulative abnormal returns for these sub-samples are summarized in Table 10.

The forth hypothesis is inspired by Rivolta (2017), who suggests that the delay in the replacement is beneficial for capital markets. At the bottom of Table 10, I summarize cumulative abnormal returns for different delays. The average cumulative abnormal return for delays between 15 and 90 days is 1.09%, significantly positive at the 10% level. This effect is even more positive and significant for internal successors. In this case, the mean is 1.99%, significant at the 5% level. For delays in the replacement shorter than two weeks or larger than three months, none of the results are statistically significant. However, it is quite apparent that the cumulative abnormal returns for medium delays are, on average, different from the cumulative abnormal returns for short and long delays. For instance, the difference in mean cumulative abnormal returns between the sub-samples with medium and with long delays, is significant at the 5% level and, it becomes even more significant for internal successors (the *p*-value groups equals 0.006).

Concisely, and in accordance with the paper by Rivolta (2017), the evidence suggests it may be beneficial for the firm value to take some time to appoint a successor following a director's death rather than pushing to appoint a director that may not be the best match for the firm. Nevertheless, it seems that when the delay in the replacement exceeds three months, the stock market reaction becomes on average more negative.

As different effects are found depending on the origin of the successor, I next calculate the cumulative abnormal returns for both internal and external successors. However, no statistical significance is found in the results, which prevents me from asserting *hypothesis V*.

Table 10
Cumulative abnormal return: Multiple sample splits

This table shows cumulative abnormal returns for the event window [-1, +1], where t=0 is the announcement date of a director's death, i.e., the first date the death is made known through either a press release or a company filing. Cumulative abnormal returns are obtained as the sum of market-model adjusted abnormal returns. Abnormal returns are winsorized at the 1% and 99% level. The *p*-values for means are calculated using robust standard errors. The *p*-values for medians are based on quantile regressions. In the first part of the table, the *p*-value groups is obtained by testing difference in means within the different sub-samples (e.g. successor internal vs. successor external). In the second part of the table, the *p*-value groups is obtained by testing difference in means between the short and medium delay, and between medium and long delay. The markers ***, **, * indicate significance at the 1%, 5% and 10% level, respectively. Sources: company filings, press releases, BX, and DS.

Category	Mean	*p*-value	Median	*p*-value	N	*p*-value groups
Full sample (with a successor)	0.06%	0.794	-0.18%	0.237	485	
Successor characteristics						
Successor internal	-0.03%	0.931	-0.22%	0.315	234	0.959
Successor external	-0.05%	0.880	-0.10%	0.709	225	
Family-related successor	2.04% **	0.027	0.85%	0.223	49	0.004
No family-related successor	-0.16%	0.490	-0.27%	0.101	436	
Successor holds MBA	0.82% *	0.074	0.37%	0.408	99	0.098
Successor does not hold MBA	-0.13%	0.616	-0.31% *	0.067	386	
General characteristics						
Successor appointed	0.06%	0.794	-0.18%	0.237	485	0.585
No successor	-0.22%	0.662	-0.37%	0.369	132	
Information found	0.00%	0.999	-0.21% *	0.094	617	0.095
No information found	-0.53% **	0.026	-0.28% *	0.063	571	
Delay in Replacement						
Short Delay: Delay < 15 Days						
Full sample	-0.06%	0.902	-0.29%	0.331	104	0.125
Successor internal	-0.43%	0.347	-0.27%	0.430	80	0.011
Successor external	-0.22%	0.874	-0.30%	0.809	17	0.824
Medium Delay: Delay between 15 and 90 days						
Full sample	1.09% *	0.061	0.00%	0.994	87	
Successor internal	1.99% **	0.047	0.49%	0.511	39	
Successor external	0.08%	0.899	-0.06%	0.928	45	
Long Delay: Delay > 90 Days						
Full sample	-0.19%	0.517	-0.21%	0.321	279	0.036
Successor internal	-0.53%	0.210	-0.51%	0.177	105	0.006
Successor external	0.00%	0.992	-0.10%	0.758	159	0.925

I proceed now with the sixth hypothesis. This one proposes that there is a different effect on stock markets depending on whether a successor family-related

to the departing director or a successor with no family ties[9] is appointed. For those observations in which the successor and the deceased director have family ties, the average cumulative abnormal return is very positive and equals 2.04%, significantly positive at the 5% level. On the other hand, when the successor and the departing director are not family relatives, stock markets react negatively. In this case, the median cumulative abnormal return is -0.27%, which almost achieves the 10% significance level. Furthermore, the *p*-value for the groups equals 0.004, which means that the difference in means between both sub-samples is highly significant. In short, it becomes quite evident that shareholders react positively to the appointment of a successor that is a family relative to the departing director, suggesting that they place value on the continuity and stability in the course of the company expected from this kind of replacement.

Next, I split the observations in the sample depending on whether the successor holds an MBA or not. I find that the appointment of a successor with an MBA leads to a strongly positive reaction on the capital markets. In this case, the average cumulative abnormal return equals 0.82%, significant at the 10% level. When comparing this with the cases in which the successor does not hold an MBA, I obtain a *p*-value groups of 0.098, i.e., both groups are significantly different from each other. In fact, when the successor does not hold MBA, the median cumulative abnormal return is negative and equals -0.31%, significant at the 10% level. I thereby assert *hypothesis VII*, which suggests that the educational background of the successor influences the reaction on the shareholder value. More precisely, I verify that stock markets react positively when the successor possesses an MBA.

In order to check *hypothesis VIII*, I now divide the observations into two groups. The first group includes the observations in which a successor is appointed, whereas the second group includes those observations in which the deceased director is not replaced. I then calculate the cumulative abnormal returns for both groups and I compare them with each other but, unfortunately, the results lack statistical significance and I cannot draw any conclusion regarding the eighth hypothesis.

[9] In this paper, I consider that the departing director and the successor are family-related when they are first-degree relatives.

Finally, I check whether there is a different effect depending on whether information about the succession is provided or not (see *hypothesis X*). The evidence suggests that stock markets do react differently depending on the availability of the information about the successors. The means for groups are different from each other at a significance level of 10%. Moreover, I find that capital markets react negatively when no information is provided. In this case, the mean is -0.53%, with a median of -0.28%, which are significant at the 5% and 10% levels, respectively. These results suggest that the uncertainty associated with the lack of information about the succession plan leads to firm value losses.

To sum up, many conclusions can be drawn from Table 10. First, stock markets react positively when the successor is appointed between 15 and 90 days after the announcement of a director's death. This reaction is much more positive when the successor is internal, i.e., he comes from the same company that experiences the exogenous departure of the director. Secondly, due to the lack of statistical significance, no conclusion for the effect of internal and external successors on capital markets is drawn. Thirdly, the appointment of both a successor family relative to the deceased director and a successor with an MBA, lead to a strongly positive reaction on the stock markets. Fourthly, as the results lack statistical significance, it is not possible to check if capital markets react differently depending on whether the departing director is replaced or not. Finally, the evidence suggests that there is a different effect on stock markets depending on whether the company provides information about the succession or not. In addition, the lack of information about the successor leads on average to negative stock price reactions.

5.2. Regression analysis

Based on the main and most significant results obtained in Section 5.1, I conduct further regression analyses to evaluate the strength of the relation between the stock price's reaction and the factors analyzed.

For all the tables in this section, I use OLS regressions with fixed effects for industry, country and year. To control for the industry, I classify the companies according to the SIC code into the Fama/French five industry classification. As shown in Table 11, only 8% of the companies in this sample belong to the healthcare, medical equipment, and drugs sector, whereas 33.9% belong to the

group Other. The rest is more or less equally distributed among the other sectors. The country fixed effects consider the 28 countries included in the sample, i.e., United States of America, United Kingdom, Canada, Hong Kong, Australia, Italy, Germany, Japan, Switzerland, France, Netherlands, Sweden, Spain, Portugal, Ireland, Finland, Turkey, Austria, Russia, Israel, Cyprus, Denmark, Norway, Belgium, Poland, Luxembourg, Greece, and Hungary. Lastly, the year fixed effects controls for the 21 years covered in this sample. In this case, the year corresponds to the year of the announcement of a director's death.

Table 11
Fama/French five industry classification

This table reports the share firms for each industry type. Sources: WS.

Industry	%
Business Equipment, Telephone and Television Transmission	15.8%
Consumer Durables, NonDurables, Wholesale, Retail, and Some Services (Laundries, Repair Shops)	19.1%
Healthcare, Medical Equipment, and Drugs	8.0%
Manufacturing, Energy, and Utilities	23.2%
Other - Mines, Constr, BldMt, Trans, Hotels, Bus Serv, Entertainment, Finance	33.9%

For each table[10], I conduct four different regressions, in which the dependent variables are the cumulative market-model adjusted abnormal returns (CAR) over the windows [-1,+1] and [-1,+2], and the cumulative market-adjusted excess returns over the windows [-1,+1] and [-1,+2].

The present section is organized as follows. Section 5.2.1 reports the relation between the availability of information and the capital market's reaction. In Section 5.2.2, I study the relation between the age of the deceased director and the capital market's reaction. Finally, in Section 5.2.3 I evaluate the relation between characteristics related to the successors and the capital market's reaction. The characteristics analyzed for the successors are age at the appointment date, family-tie with the deceased director, and possession of an MBA.

5.2.1. Announcement effects: Information

As already discussed in Section 5.1.2, the results included in Table 10 suggest that capital markets react differently depending on whether the company provides information about the succession after the announcement of a director's death or, in contrast, no information is provided. More precisely, I find that there

[10] The tables in this section presenting the regression results are inspired by Table 3 in the paper by Schmid, and Urban (2017), p. 39.

is a negative reaction on stock markets when the firm does not provide any information about the succession. In this section, I first perform the following regression using different returns to provide further evidence to this statement:

$$y_i = \beta \cdot [\text{NO INFORMATION}]_i + \rho_i + \tau_i + \varphi_i + \varepsilon_i \quad (4)$$

where y_i represents the return, NO INFORMATION is a dummy variable which is set to one when there is no information about the succession available and to zero otherwise, β is the coefficient for no information, ρ_i, τ_i, and φ_i are the fixed effects for industry, country, and year, respectively, ε_i is the error, and the index $i \in \{1, \dots, N\}$ represents the observation.

The results for this regression analysis are summarized in Panel A of Table 12. I obtain negative coefficients corresponding to NO INFORMATION for all the regressions considered. However, the results for the window [-1,+2] lack statistical significance. For the event window [-1,+1], I estimate the effect of NO INFORMATION in the case of the CAR-based regression to -0.67%, and to -0.59% when I choose the excess return as the dependent variable. Both of them are significant at the 10% level.

After this, I repeat the same regressions, but this time, adding some controls for the firm characteristics:

$$\begin{aligned} y_i = \beta \cdot [\text{NO INFORMATION}]_i + \alpha \cdot [\text{SIZE}]_i + \gamma \cdot [\text{PROFITABILITY}]_i \\ + \delta \cdot [\text{LEVERAGE}]_i + \rho_i + \tau_i + \varphi_i + \varepsilon_i \end{aligned} \quad (5)$$

where $y_i, \beta, \rho_i, \tau_i, \varphi_i, \varepsilon_i,$ and NO INFORMATION are defined as before, SIZE represents the natural logarithm of total assets in $ millions, PROFITABILITY represents the quotient between EBIT and total assets, LEVERAGE is the quotient between total debt and total assets, and the coefficients α, γ, and δ are the coefficients for size, profitability, and leverage, respectively.

The results are summarized in Panel B of Table 12. For the CAR-based regression, the effect of NO INFORMATION remains more or less the same as in Panel A. The coefficient for NO INFORMATION for the window [-1,+1] is now -0.69%, significant at the 10% level. On the other hand, the effect of NO INFORMATION becomes more negative when considering excess returns as

the dependent variable. It decreases from -0.59% to -0.68%, also significant at the 10% level.

Table 12
Announcement effects: Information

This table reports the results of OLS regressions for different event windows, where t=0 is the announcement date of a director's death, i.e., the first date the death is made known through either a press release or a company filing. The dependent variables are cumulative abnormal returns and excess returns. Cumulative abnormal returns (CAR) are obtained as the sum of market-model adjusted abnormal returns. Excess returns obtained as the sum of market-adjusted excess returns. Abnormal returns are winsorized at the 1% and 99% level. The p-values for means are calculated using robust standard errors and shown in parentheses. No information is a dummy variable that equals one when no information about the succession is provided and zero otherwise. Size represents the natural logarithm of total assets in $ millions. Profitability is obtained as the quotient between EBIT and total assets. Leverage is obtained as the quotient between total debt and total assets. Industry fixed effects consider the Fama/French five industry classification. Country fixed effects consider the 28 countries included in the sample. Year fixed effects considers the 21 event years included in the sample. The markers ***, **, * indicate significance at the 1%, 5% and 10% level, respectively. Sources: company filings, press releases, WS, and DS.

Panel A: Information

Dependent variable	CAR		Excess Returns	
Event window in trading days	[-1, +1]	[-1, +2]	[-1, +1]	[-1, +2]
No information	-0.67% *	-0.62%	-0.59% *	-0.47%
	(0.061)	(0.115)	(0.080)	(0.195)
Observations	1,172	1,172	1,168	1,167
Events with no information	571	571	571	571
R^2	0.061	0.055	0.052	0.052
Industry fixed effects	yes	yes	yes	yes
Country fixed effects	yes	yes	yes	yes
Year fixed effects	yes	yes	yes	yes

Panel B: Firm controls

Dependent variable	CAR		Excess Returns	
Event window in trading days	[-1, +1]	[-1, +2]	[-1, +1]	[-1, +2]
Size	0.09%	0.08%	0.01%	-0.03%
	(0.289)	(0.361)	(0.863)	(0.696)
Profitability	0.15%	0.25% *	0.08%	0.19%
	(0.144)	(0.098)	(0.452)	(0.183)
Leverage	-0.12% **	-0.16% *	0.01%	0.08% **
	(0.039)	(0.093)	(0.506)	(0.027)
No information	-0.69% *	-0.55%	-0.68% *	-0.53%
	(0.068)	(0.182)	(0.058)	(0.177)
Observations	1,080	1,080	1,076	1,075
Events with no information	494	494	494	494
R^2	0.079	0.078	0.064	0.064
Industry fixed effects	yes	yes	yes	yes
Country fixed effects	yes	yes	yes	yes
Year fixed effects	yes	yes	yes	yes

In short, the results obtained suggest that the lack of information about succession leads to negative reactions on stock markets. Therefore, I confirm *hypothesis X*, i.e., the availability of information about the succession plan around

the announcement of a director's death has an effect on the capital market's reaction. Specifically, and consistent with the results in Table 10, capital markets tend to react negatively to the uncertainty associated with the lack of information about the succession, which suggests that investors value being well informed about the new course in the company following the exogenous departure of a director due to death.

5.2.2. Announcement effects: Departing director

This section aims to investigate whether the characteristics of the deceased director influence the stock price reaction at the announcement date of his death. Specifically, and in connection with *hypothesis III*, I now study the relation between the age of the director and both, the cumulative abnormal return and the excess returns for the event windows [-1,+1] and [-1,+2] around the announcement of a director's death.

Previously, in Section 5.1.2, I calculate the cumulative abnormal returns for each age tercile, but no clear pattern could be drawn due to lack of statistical significance. These results were summarized in Panel A of Table 8. Continuing with this idea, I now evaluate the relation between the returns around the announcement date and the age of the deceased director by performing the follwing regression:

$$y_i = \beta \cdot [\text{AGE DECEASED DIRECTOR}]_i + \rho_i + \tau_i + \varphi_i + \varepsilon_i \qquad (6)$$

where y_i represents the return, AGE DECEASED DIRECTOR is the age of the departing director at time of death, β is the coefficient for the age, ρ_i, τ_i, and φ_i are the fixed effects for industry, country, and year, respectively, ε_i is the error, and the index $i \in \{1, \dots, N\}$ represents the observation.

Panel A of Table 13 presents the results of mentioned analysis. I obtain positive coefficients corresponding to AGE DECEASED DIRECTOR for all the regressions considered, although only the coefficient obtained when studying the excess return for the event window [-1,+1] is statistically significant. In this case, the effect of the age is estimated to 0.03%, significant at the 10% level. In other words, the results suggest that for each year of age of the deceased director, the effect on capital markets increases by 0.03%.

Table 13
Announcement effects: Age deceased director

This table reports the results of OLS regressions for different event windows, where t=0 is the announcement date of a director's death, i.e., the first date the death is made known through either a press release or a company filing. The dependent variables are cumulative abnormal returns and excess returns. Cumulative abnormal returns (CAR) are obtained as the sum of market-model adjusted abnormal returns. Excess returns obtained as the sum of market-adjusted excess returns. Abnormal returns are winsorized at the 1% and 99% level. The *p*-values for means are calculated using robust standard errors and shown in parentheses. Age deceased director is an integer variable that represents the age of the departing director at the death time. Size represents the natural logarithm of total assets in $ millions. Profitability is obtained as the quotient between EBIT and total assets. Leverage is obtained as the quotient between total debt and total assets. Industry fixed effects consider the Fama/French five industry classification. Country fixed effects consider the 28 countries included in the sample. Year fixed effects considers the 21 event years included in the sample. The markers ***, **, * indicate significance at the 1%, 5% and 10% level, respectively. Sources: company filings, press releases, BX, WS, and DS.

Panel A: Age deceased director

Dependent variable	CAR		Excess Returns	
Event window in trading days	[-1, +1]	[-1, +2]	[-1, +1]	[-1, +2]
Age deceased director	0.03%	0.02%	0.03% *	0.02%
	(0.138)	(0.336)	(0.074)	(0.180)
Observations	988	988	984	983
R^2	0.081	0.065	0.069	0.069
Industry fixed effects	yes	yes	yes	yes
Country fixed effects	yes	yes	yes	yes
Year fixed effects	yes	yes	yes	yes

Panel B: Firm controls

Dependent variable	CAR		Excess Returns	
Event window in trading days	[-1, +1]	[-1, +2]	[-1, +1]	[-1, +2]
Size	0.09%	0.04%	0.06%	0.01%
	(0.310)	(0.683)	(0.465)	(0.928)
Profitability	0.17%	0.30% *	0.06%	0.16%
	(0.103)	(0.063)	(0.593)	(0.275)
Leverage	-0.01%	0.02%	-0.01%	0.02%
	(0.600)	(0.409)	(0.656)	(0.393)
Age deceased director	0.02%	0.01%	0.03%	0.02%
	(0.187)	(0.514)	(0.118)	(0.311)
Observations	911	911	907	906
R^2	0.092	0.080	0.090	0.082
Industry fixed effects	yes	yes	yes	yes
Country fixed effects	yes	yes	yes	yes
Year fixed effects	yes	yes	yes	yes

I then perform the same regression but with some controls for the firm characteristics:

$$y_i = \beta \cdot [\text{AGE DECEASED DIRECTOR}]_i + \alpha \cdot [\text{SIZE}]_i + \gamma \cdot [\text{PROFITABILITY}]_i + \delta \cdot [\text{LEVERAGE}]_i + \rho_i + \tau_i + \varphi_i + \varepsilon_i \quad (7)$$

where $y_i, \beta, \rho_i, \tau_i, \varphi_i, \varepsilon_i,$ and AGE DECEASED DIRECTOR are defined as before, SIZE represents the natural logarithm of total assets in $ millions,

PROFITABILITY represents the quotient between EBIT and total assets, LEVERAGE is the quotient between total debt and total assets, and the coefficients α, γ, and δ are the coefficients for size, profitability, and leverage, respectively.

As presented in Panel B of Table 13, the effects barely change when I also control for the firm characteristics size, profitability and, leverage. The coefficients corresponding to AGE DECEASED DIRECTOR are nearly the same as in Panel A, but this time, none of them reach the 10% significance level.

To sum up, the results obtained in this section suggest that the effects on capital markets when a director dies tend to be more positive, the older the deceased director is. This evidence leads me to assert the third hypothesis. However, it is to be noted here that the effect of age of the deceased director on capital markets presents a weaker statistical significance compared to the other effects analyzed in Section 5.2.

5.2.3. Announcement effects: Successors

The purpose of this section is to evaluate whether the successors have an influence on the capital market reaction following the exogenous departure of a director due to death. Based on the most significant results obtained from the univariate analysis in Section 5.1.2, the characteristics analyzed for the successors are the age at the appointment date, the family tie with the deceased director, and the possession of an MBA. Following the same line as in the previous sections, I conduct several regressions based on four different dependent variables. These variables are the cumulative abnormal returns and the excess returns for both, the event windows [-1,+1] and the event window [-1,+2].

In the first place, and with regard to the third hypothesis, I analyze the relation between the age of the successor and the stock market returns around the announcement of a director's death. From the univariate analysis conducted in Section 5.1.2, a general pattern becomes clear when analyzing the relation between the stock market return and the age of the successors. That is, capital markets react more positively to exogenous departures of directors, the younger the successor is.

In order to provide further evidence to this assumption, I now conduct some regression analyses to evaluate the strength of the relation between the effect on

the stock market when a director dies, and the age of the successor at the appointment date. The first regression performed is:

$$y_i = \beta \cdot [\text{AGE SUCCESSOR}]_i + \rho_i + \tau_i + \varphi_i + \varepsilon_i \tag{8}$$

where y_i represents the return, AGE SUCCESSOR is the age of the successor at the appointment date, β is the coefficient for the age of the successor, ρ_i, τ_i, and φ_i are the fixed effects for industry, country, and year, respectively, ε_i is the error, and the index $i \in \{1, \dots, N\}$ represents the observation.

Next, I add some controls for the firm and the regression results as follows:

$$\begin{aligned} y_i = \beta \cdot [\text{AGE SUCCESSOR}]_i + \alpha \cdot [\text{SIZE}]_i + \gamma \cdot [\text{PROFITABILITY}]_i + \\ \delta \cdot [\text{LEVERAGE}]_i + \rho_i + \tau_i + \varphi_i + \varepsilon_i \end{aligned} \tag{9}$$

where $y_i, \beta, \rho_i, \tau_i, \varphi_i, \varepsilon_i,$ and AGE SUCCESSOR are defined as before, SIZE represents the natural logarithm of total assets in $ millions, PROFITABILITY represents the quotient between EBIT and total assets, LEVERAGE is the quotient between total debt and total assets, and the coefficients α, γ, and δ are the coefficients for size, profitability, and leverage, respectively.

As reported in Table 14, all the coefficients corresponding to AGE SUCCESSOR are negative, regardless of the dependent variable used for the regression and which time window has been considered. For instance, over the window [-1,+1], all the effects of AGE SUCCESSOR are estimated to -0.04%. That means that, for each year of age of the successor, the effect on capital markets decreases by -0.04%. Nevertheless, the statistical significance of these results is questionable. The *p*-values become lower when I also control for the firm characteristics in the regression and, therefore, the statistical significance increases. However, none of them break the 10% significance level.

In a few words, no highly significant effect is found when studying the relation between stock price's reaction and the age for both, the deceased director and the successor. Nevertheless, it is noteworthy that, whereas the coefficients corresponding to the age of the deceased directors are positive, the ones corresponding to the age of the successors are negative. These findings suggest that in fact, the age has somehow an effect on capital markets when a director dies, i.e., on average, the firm value falls following the death of a young director

and, in contrast, it increases when a young director is appointed to the board. However, only some of these effects break the 10% level of statistical significance and, therefore, one should take these considerations with caution.

Table 14
Announcement effects: Age successor

This table reports the results of OLS regressions for different event windows, where t=0 is the announcement date of a director's death, i.e., the first date the death is made known through either a press release or a company filing. The dependent variables are cumulative abnormal returns and excess returns. Cumulative abnormal returns (CAR) are obtained as the sum of market-model adjusted abnormal returns. Excess returns obtained as the sum of market-adjusted excess returns. Abnormal returns are winsorized at the 1% and 99% level. The *p*-values for means are calculated using robust standard errors and shown in parentheses. Age successor is an integer variable that represents the age of the successor at the appointment date. Size represents the natural logarithm of total assets in $ millions. Profitability is obtained as the quotient between EBIT and total assets. Leverage is obtained as the quotient between total debt and total assets. Industry fixed effects consider the Fama/French five industry classification. Country fixed effects consider the 28 countries included in the sample. Year fixed effects considers the 21 event years included in the sample. The markers ***, **, * indicate significance at the 1%, 5% and 10% level, respectively. Sources: company filings, press releases, BX, WS, and DS.

Panel A: Age successor

Dependent variable	CAR		Excess Returns	
Event window in trading days	[-1, +1]	[-1, +2]	[-1, +1]	[-1, +2]
Age successor	-0.04%	-0.02%	-0.04%	-0.02%
	(0.171)	(0.508)	(0.160)	(0.489)
Observations	416	416	413	413
R^2	0.189	0.172	0.157	0.157
Industry fixed effects	yes	yes	yes	yes
Country fixed effects	yes	yes	yes	yes
Year fixed effects	yes	yes	yes	yes

Panel B: Firm controls

Dependent variable	CAR		Excess Returns	
Event window in trading days	[-1, +1]	[-1, +2]	[-1, +1]	[-1, +2]
Size	0.20%	0.10%	0.24%	0.13%
	(0.120)	(0.528)	(0.049)	(0.379)
Profitability	0.51%	0.72%	0.15%	0.24%
	(0.246)	(0.249)	(0.562)	(0.536)
Leverage	0.03%	0.03%	0.03%	0.03%
	(0.532)	(0.566)	(0.426)	(0.571)
Age successor	-0.04%	-0.03%	-0.04%	-0.03%
	(0.158)	(0.405)	(0.134)	(0.371)
Observations	399	399	396	396
R^2	0.205	0.187	0.193	0.165
Industry fixed effects	yes	yes	yes	yes
Country fixed effects	yes	yes	yes	yes
Year fixed effects	yes	yes	yes	yes

In second place, and in connection with *hypothesis VI*, I study now the effect on capital markets due to exogenous departures of directors when the successor and the deceased director are family relatives. From the results in Table 10, I infer that, following the death of a director, there is a significant positive

reaction on stock prices when a family-related successor is appointed. In this section, I perform some regression analyses using different returns to investigate this effect further. As mentioned before, the returns used are cumulative abnormal returns and excess returns around the announcement of a director's death. The formula for the regression could be written as follows:

$$y_i = \beta \cdot [\text{FAMILY}]_i + \rho_i + \tau_i + \varphi_i + \varepsilon_i \tag{10}$$

where y_i represents the return, FAMILY is a dummy variable that equals one when the deceased director and the successor are family relatives, and zero otherwise, β is the coefficient for family, ρ_i, τ_i, and φ_i are the fixed effects for industry, country, and year, respectively, ε_i is the error, and the index $i \in \{1, \dots, N\}$ represents the observation.

Consistent with the results in Table 10, I find strongly positive coefficients corresponding to FAMILY for all the regressions considered. In Panel A of Table 15 for example, the FAMILY coefficient for the event window [-1,+1] equals 2.21% for the CAR-based regression, and 2.38% when I employ the excess returns as the dependent variable. These effects are significant at the 5% and 1% level, respectively. In contrast, the results lack statistical significance for the event window [-1,+2].

Following the same approach as in the previous section, I then add some controls for the firm to the regression:

$$\begin{aligned} y_i = \beta \cdot [\text{FAMILY}]_i + \alpha \cdot [\text{SIZE}]_i + \gamma \cdot [\text{PROFITABILITY}]_i + \\ \delta \cdot [\text{LEVERAGE}]_i + \rho_i + \tau_i + \varphi_i + \varepsilon_i \end{aligned} \tag{11}$$

where $y_i, \beta, \rho_i, \tau_i, \varphi_i, \varepsilon_i,$ and FAMILY are defined as before, SIZE represents the natural logarithm of total assets in $ millions, PROFITABILITY represents the quotient between EBIT and total assets, LEVERAGE is the quotient between total debt and total assets, and the coefficients α, γ, and δ are the coefficients for size, profitability, and leverage, respectively. The results are presented on Panel B of Table 15.

Now, the FAMILY coefficients are even more positive and with lower *p*-values, which means that they are more significant. For the event window [-1,+1], I estimate the effect of FAMILY in the case of the CAR-based regression

to 2.29%, and to 2.42% when I choose the excess return as the dependent variable. Both of them are significant at the 5% level.

Table 15
Announcement effects: Family

This table reports the results of OLS regressions for different event windows, where t=0 is the announcement date of a director's death, i.e., the first date the death is made known through either a press release or a company filing. The dependent variables are cumulative abnormal returns and excess returns. Cumulative abnormal returns (CAR) are obtained as the sum of market-model adjusted abnormal returns. Excess returns obtained as the sum of market-adjusted excess returns. Abnormal returns are winsorized at the 1% and 99% level. The *p*-values for means are calculated using robust standard errors and shown in parentheses. Family is a dummy variable that equals one when the deceased director and the successor are family relative and zero otherwise. Size represents the natural logarithm of total assets in $ millions. Profitability is obtained as the quotient between EBIT and total assets. Leverage is obtained as the quotient between total debt and total assets. Industry fixed effects consider the Fama/French five industry classification. Country fixed effects consider the 28 countries included in the sample. Year fixed effects considers the 21 event years included in the sample. The markers ***, **, * indicate significance at the 1%, 5% and 10% level, respectively. Sources: company filings, press releases, BX, WS, and DS.

Panel A: Family

Dependent variable	CAR		Excess Returns	
Event window in trading days	[-1, +1]	[-1, +2]	[-1, +1]	[-1, +2]
Family	2.21% **	1.18%	2.38% ***	1.40%
	(0.014)	(0.171)	(0.010)	(0.118)
Observations	482	482	478	478
Events family	49	49	49	49
R^2	0.139	0.120	0.101	0.101
Industry fixed effects	yes	yes	yes	yes
Country fixed effects	yes	yes	yes	yes
Year fixed effects	yes	yes	yes	yes

Panel B: Firm controls

Dependent variable	CAR		Excess Returns	
Event window in trading days	[-1, +1]	[-1, +2]	[-1, +1]	[-1, +2]
Size	0.07%	0.01%	0.07%	0.00%
	(0.605)	(0.948)	(0.549)	(0.997)
Profitability	0.49%	0.67%	0.19%	0.27%
	(0.256)	(0.251)	(0.468)	(0.456)
Leverage	0.02%	0.02%	0.01%	0.00%
	(0.748)	(0.793)	(0.897)	(0.944)
Family	2.29% **	1.30%	2.42% **	1.47%
	(0.011)	(0.139)	(0.010)	(0.111)
Observations	460	460	456	456
Events family	48	48	48	48
R^2	0.142	0.132	0.125	0.105
Industry fixed effects	yes	yes	yes	yes
Country fixed effects	yes	yes	yes	yes
Year fixed effects	yes	yes	yes	yes

To put it briefly, the evidence suggests that the appointment of a successor with family ties to the deceased director has a large effect on stock markets at the announcement date of a director's death, which confirms the *hypothesis VI*

presented in Section 3. Based on the results obtained, I can specifically assert that, on average, a family tie between the successor and the departing director leads to an increase in the stock market returns.

In view of these results, I check whether this positive reaction on capital markets when the successor and the departing director are family relatives, is associated with any agency issues. There are many different ways to measure these conflicts between shareholders and managers, but in this thesis I use free cash flows and dividends to estimate them.

As pointed out in the paper by Jensen (1986), high free cash flows lead to more severe agency problems. Based on this statement, Kargar, and Gholam (2013) investigate how firms with high levels of free cash flows could avoid its associated agency problems. They conduct the analysis across different firms from Iran, using, among other factors, free cash flows to measure agency costs. Following their approach, I use free cash flows to check whether the positive family effect on capital markets is driven by any agency issues. However, as shown in Panel A of Appendix 3, I do not find any significant relation between free cash flows and the fact that the successor and the departing director are family relatives. I then evaluate the relation between free cash flows and the abnormal announcement returns but, again, no significant relation is found. These results are summarized in Panel B of Appendix 3.

Next, and based on the statement in the paper by La Porta et al. (1999) that some agency issues stem from dividend policies, I repeat the same analysis, but this time, using the dividends as a measure for the agency costs. Nevertheless, as shown in Appendix 3, I do not find any significant relation between the dividends and the positive family effect on capital markets, thereby finding no evidence that this positive family effect on the capital market is driven by any agency issues. However, due to the large amount of variables involved in agency costs, it may be interesting to step up research into this topic.

In third place, and based on the results obtained in Table 10, I now investigate whether stock markets react positively when the successor possesses an MBA. With this in mind, I conduct the next regression:

$$y_i = \beta \cdot [\text{MBA}]_i + \rho_i + \tau_i + \varphi_i + \varepsilon_i \qquad (12)$$

where y_i represents the return, MBA is a dummy variable that is set to one when the successor has an MBA and to zero otherwise, β is the coefficient for MBA, ρ_i, τ_i, and φ_i are the fixed effects for industry, country, and year, respectively, ε_i is the error, and the index $i \in \{1, \dots, N\}$ represents the observation. The results are presented in Panel A of Table 16.

Table 16
Announcement effects: Successor holds an MBA

This table reports the results of OLS regressions for different event windows, where t=0 is the announcement date of a director's death, i.e., the first date the death is made known through either a press release or a company filing. The dependent variables are cumulative abnormal returns and excess returns. Cumulative abnormal returns (CAR) are obtained as the sum of market-model adjusted abnormal returns. Excess returns obtained as the sum of market-adjusted excess returns. Abnormal returns are winsorized at the 1% and 99% level. The *p*-values for means are calculated using robust standard errors and shown in parentheses. Successor holds MBA is a dummy variable that equals one when the successor has an MBA and zero otherwise. Size represents the natural logarithm of total assets in $ millions. Profitability is obtained as the quotient between EBIT and total assets. Leverage is obtained as the quotient between total debt and total assets. Industry fixed effects consider the Fama/French five industry classification. Country fixed effects consider the 28 countries included in the sample. Year fixed effects considers the 21 event years included in the sample. The markers ***, **, * indicate significance at the 1%, 5% and 10% level, respectively. Sources: company filings, press releases, BX, WS, and DS.

Panel A: Successor holds MBA

Dependent variable	CAR		Excess Returns	
Event window in trading days	[-1, +1]	[-1, +2]	[-1, +1]	[-1, +2]
Successor holds MBA	0.94%	1.10% *	1.03% *	1.19% *
	(0.101)	(0.086)	(0.071)	(0.067)
Observations	482	482	478	478
Events successor holds MBA	99	99	99	99
R^2	0.130	0.122	0.102	0.102
Industry fixed effects	yes	yes	yes	yes
Country fixed effects	yes	yes	yes	yes
Year fixed effects	yes	yes	yes	yes

Panel B: Firm controls

Dependent variable	CAR		Excess Returns	
Event window in trading days	[-1, +1]	[-1, +2]	[-1, +1]	[-1, +2]
Size	0.05%	0.00%	0.06%	-0.01%
	(0.675)	(1.000)	(0.626)	(0.939)
Profitability	0.49%	0.68%	0.19%	0.28%
	(0.254)	(0.246)	(0.460)	(0.444)
Leverage	0.02%	0.02%	0.01%	0.00%
	(0.752)	(0.782)	(0.905)	(0.952)
Successor holds MBA	0.86%	1.09%	1.00% *	1.24% *
	(0.143)	(0.103)	(0.091)	(0.069)
Observations	460	460	456	456
Events successor holds MBA	92	92	92	92
R^2	0.131	0.133	0.113	0.106
Industry fixed effects	yes	yes	yes	yes
Country fixed effects	yes	yes	yes	yes
Year fixed effects	yes	yes	yes	yes

As expected, I obtain positive coefficients corresponding to MBA for all the regressions considered. In Panel A of Table 16, when I consider the cumulative abnormal returns as the dependent variable, the effects of having an MBA for the event windows [-1,+1] and [-1,+2] are estimated to 0.94% and 1.10%, respectively. For the window [-1,+2], the MBA coefficient is significant at the 10% level, whereas it barely achieves the 10% level of significance when using the time window [-1,+1]. If I now consider excess returns as the dependent variable, the MBA coefficients for both time windows are significant at the 10% level. In this case, the effects of having an MBA for the event windows [-1,+1] and [-1,+2] are now estimated to 1.03% and 1.19%, respectively.

I then repeat the same regressions, but this time, adding some controls for the firm characteristics, i.e., adding the independent variables; size, profitability and leverage to the regression:

$$y_i = \beta \cdot [\text{MBA}]_i + \alpha \cdot [\text{SIZE}]_i + \gamma \cdot [\text{PROFITABILITY}]_i + \delta \cdot [\text{LEVERAGE}]_i + \rho_i + \tau_i + \varphi_i + \varepsilon_i \quad (13)$$

where $y_i, \beta, \rho_i, \tau_i, \varphi_i, \varepsilon_i,$ and MBA are defined as before, SIZE represents the natural logarithm of total assets in $ millions, PROFITABILITY represents the quotient between EBIT and total assets, LEVERAGE is the quotient between total debt and total assets, and the coefficients α, γ, and δ are the coefficients for size, profitability, and leverage, respectively. These results are summarized in Panel B of Table 16.

Now, the statistical significance for coefficients based on the CAR-regression is lost. The corresponding *p*-values for the windows [-1,+1] and [-1,+2] are 0.143 and 0.103, respectively, which do not break the 10% level of significance, although it should be noted that they are not that far off. In contrast, the statistical significance for the MBA coefficients obtained when considering the excess returns as the dependent variable remains more or less the same as in Panel A. In this case, the effects of having and MBA for the event windows [-1,+1] and [-1,+2] are now estimated to 1.00% and 1.24%, respectively.

In short, it becomes quite clear that the educational background of the successors also influences the stock market reaction after a director's death. Therefore, *hypothesis VIII* is also confirmed. More precisely, the evidence

suggests that capital markets react positively when the appointed successor holds an MBA. As mentioned in Section 2, Bertrand, and Schoar (2003), already pointed out that firms tend to follow more aggressive strategies when managers hold an MBA, leading to higher returns on assets, more debt and fewer dividends. Based on these findings, it seems possible to assume that, compared to following a conservative strategy, an aggressive strategy is more appreciated by the shareholders and, consequently, the appointment of a successor that holds an MBA has a beneficial effect on the stock market's reaction. It may be interesting to further research this assumption.

Finally, I evaluate which characteristics of the successors influence more the reaction on capital markets following the exogenous departure of a director due to death. To this end, I perform a last regression analysis with all the characteristics for the successors together:

$$\begin{aligned} y_i = \beta_1 \cdot [\text{AGE SUCCESSOR}]_i + \beta_2 \cdot [\text{FAMILY}]_i + \beta_3 \cdot [\text{MBA}]_i + \\ \alpha \cdot [\text{SIZE}]_i + \gamma \cdot [\text{PROFITABILITY}]_i + \delta \cdot [\text{LEVERAGE}]_i + \\ \rho_i + \tau_i + \varphi_i + \varepsilon_i \end{aligned} \tag{14}$$

where y_i represents the return, AGE SUCCESSOR is the age of the successor at the appointment date, FAMILY is a dummy variable that equals one when the deceased director and the successor are family relative and zero otherwise, MBA is a dummy variable that is set to one when the successor has an MBA and to zero otherwise, β_1 , β_2 , and β_3 are the coefficients for age, family, and MBA, respectively, SIZE represents the natural logarithm of total assets in $ millions, PROFITABILITY represents the quotient between EBIT and total assets, LEVERAGE is the quotient between total debt and total assets, and the coefficients α, γ, and δ are the coefficients for size, profitability, and leverage, respectively, ρ_i, τ_i, and φ_i are the fixed effects for industry, country, and year, respectively, ε_i is the error, and the index $i \in \{1, \dots, N\}$ represents the observation. The results are summarized in Table 17.

It now becomes very clear that the independent variables FAMILY and MBA influence the stock price's reaction much more than the age of the successors do. As shown in Table 17, all the AGE SUCCESSOR coefficients now lack statistical significance. However, both the FAMILY and the MBA coefficients are now even

more significant than in the previous regressions (Tables 15 and 16). In addition, these effects are not only more significant, but they are also stronger.

Table 17
Announcement effects: Summary for successors

This table reports the results of OLS regressions for different event windows, where t=0 is the announcement date of a director's death, i.e., the first date the death is made known through either a press release or a company filing. The dependent variables are cumulative abnormal returns and excess returns. Cumulative abnormal returns (CAR) are obtained as the sum of market-model adjusted abnormal returns. Excess returns obtained as the sum of market-adjusted excess returns. Abnormal returns are winsorized at the 1% and 99% level. The p-values for means are calculated using robust standard errors and shown in parentheses. Family is a dummy variable that equals one when the deceased director and the successor are family relative and zero otherwise. Age successor is an integer variable that represents the age of the successor at the appointment date. Successor holds MBA is a dummy variable that equals one when the successor has an MBA and zero otherwise. Size represents the natural logarithm of total assets in $ millions. Profitability is obtained as the quotient between EBIT and total assets. Leverage is obtained as the quotient between total debt and total assets. Industry fixed effects consider the Fama/French five industry classification. Country fixed effects consider the 28 countries included in the sample. Year fixed effects considers the 21 event years included in the sample. The markers ***, **, * indicate significance at the 1%, 5% and 10% level, respectively. Sources: company filings, press releases, BX, WS, and DS.

Dependent variable	CAR		Excess Returns	
Event window in trading days	[-1, +1]	[-1, +2]	[-1, +1]	[-1, +2]
Size	0.19%	0.09%	0.23% *	0.12%
	(0.127)	(0.554)	(0.052)	(0.401)
Profitability	0.51%	0.72%	0.14%	0.23%
	(0.247)	(0.248)	(0.570)	(0.535)
Leverage	0.03%	0.04%	0.03%	0.03%
	(0.513)	(0.544)	(0.409)	(0.539)
Family	2.61% ***	1.75% *	2.47% ***	1.45%
	(0.002)	(0.064)	(0.004)	(0.118)
Age successor	-0.01%	0.00%	-0.01%	-0.01%
	(0.711)	(0.917)	(0.634)	(0.832)
Successor holds MBA	1.21% **	1.31% **	1.36% **	1.49% **
	(0.034)	(0.048)	(0.023)	(0.030)
Observations	399	399	396	396
R^2	0.234	0.202	0.223	0.182
Industry fixed effects	yes	yes	yes	yes
Country fixed effects	yes	yes	yes	yes
Year fixed effects	yes	yes	yes	yes

For instance, the coefficients corresponding to FAMILY for the event window [-1,+1] are significant at the 1% level. They are now estimated to 2.61% and 2.47%, depending on whether I consider the cumulative abnormal return or the excess return as the dependent variable, respectively. Furthermore, all the MBA coefficients are now significant at the 5% level. I estimate the effect of MBA in the case of the CAR-based regression to 1.21% and to 1.31%, for the event windows [-1,+1] and [-1,+2]. When considering the regression based on the

excess returns, both coefficients become higher and equal 1.36% and 1.49% for the mentioned windows, respectively.

When comparing the family effect with the MBA effect, it is noteworthy that, on the one hand, the effect of family for the time window [-1,+1] is not only about double that of the MBA effect, but also much more significant. On the other hand, when considering the event window [-1,+2], the effect of MBA becomes now more significant than the family effect and, although the MBA coefficients are still lower than the family coefficients, they are much closer than in the other time window.

6. Conclusions

With the present thesis I contribute to an extensive literature about the effects of exogenous departures of board members on shareholder value and firm performance. Following the objectives set in Section 1, I extend the research of death cases to a large and general sample so as to provide further evidence to some capital market effects that have already been described in previous literature, e.g. Jenter, Matveyev, and Roth (2017), Nguyen, and Nielsen (2009), and Rivolta (2017). I then employ statistical methods to identify the factors that drive this effect. Special attention is given to the choice of the successor.

The analysis conducted in this paper about exogenous departures of directors due to death indicates that there is a reaction on the capital markets when a director dies. The results obtained from the analysis show that the response of the capital markets is very heterogeneous. On average, the death of a director is associated with negative stock price reactions. However, the appointment of both a successor familiarly related to the departing director, and a director with an MBA, is associated with large and significant value gains.

As shown in Section 5.2, first-degree family ties between the deceased director and the successor lead to significant positive stock market reactions around the announcement of a director's death. This positive effect suggests that shareholders value the continuity and stability expected following the appointment of a family relative. In this thesis, I also check whether this positive family stock markets reaction can be associated with any agency issues. To this end, I use free cash flows and dividends as an agency costs measure, but no

significant relation is found. Hence, I find no evidence that this positive family effect on capital market is driven by agency issues and leave a way open to further research.

With regard to the seventh hypothesis presented in Section 3, I find that the educational background of the successors influences the stock market's reaction after a board member's death. In particular, the appointment of a director that holds an MBA is associated with significant positive capital market reactions. When considering this conclusion in conjunction with the paper by Bertrand, and Schoar (2003), it seems tempting to conclude that shareholders place more value on aggressive strategies, followed by managers with an MBA, rather than on more conservative strategies, generally followed by older managers. However, further research on this topic is needed to verify this assumption.

Corresponding to *hypothesis III* described in Section 3, I have investigated the relation between the age of the directors and the stock price reaction. On one hand, the evidence suggests that capital markets react more negatively to the departure of young directors than to the departure of old directors. On the other hand, the evidence shows that capital markets react more positively to the appointment of young directors than to the appointment of old directors. Taking both results as a whole, it seems that young directors are beneficial to shareholders, which is consistent with the results presented in the paper by Jenter, Matveyev, and Roth (2017). It is also to be said here, that the results obtained in this thesis show only a weak relation between the age of the directors and the shareholder value and it may be interesting to further investigate this relation.

I additionally investigate whether the period between the announcement of a director's death and the announcement of the successor has an effect on the stock price reaction around the death's announcement. Rivolta (2017) already suggested that higher delays may allow the companies to find a better CEO and therefore, the delay in the replacement leads to a positive effect on the stock markets. Extending the analysis to all board members, I find that, for intermediate delays between two weeks and three months, there is a significant positive reaction on capital markets and this reaction is much more pronounced for internal successors, i.e., directors that were already in the firm before their appointment. Consistent with the evidence in the paper by Rivolta (2017), it seems beneficial for the firm value when the board of directors takes some time to appoint a successor

following the exogenous departure of a director. Nevertheless, my results suggest that these value gains tend to decrease when the delay in replacement exceeds three months.

Finally, regarding *hypothesis X*, I find that the availability of information about the succession around the announcement of a director's death, has an impact on the capital markets. More precisely, the results obtained suggest that there is a significant negative reaction on capital markets when no information about the succession is provided. One possible reason for this reaction is the assumption that shareholders react negatively to the uncertainty surrounding an exogenous departure of a director, meaning that investors always value being informed about the new course in the company.

Appendix

Appendix 1: Abnormal Returns around Successor's Appointment[11]

This table shows abnormal returns for the days around the announcement of a successor (t=0), which means the first date the successor is made known through either a press release or a company filing. Panel A summarizes market-model adjusted abnormal returns, obtained by subtracting predicted returns from stock returns. I estimate the predicted returns using a market model based on the window [-230, -30] before the announcement of the director's death. Firms with less than 100 return observations in this window have not been considered. The FTSE All World index return has been used as market benchmark. Panel B summarizes market-adjusted excess returns, obtained by subtracting FTSE All World index return from stock returns. Abnormal returns are winsorized daily at the 1% and 99% level. The *p*-values for means are calculated using robust standard errors. The *p*-values for medians are based on quantile regressions. The markers ***, **, * indicate significance at the 1%, 5% and 10% level, respectively. Sources: company filings, press releases, and DS.

Panel A: Market-model adjusted abnormal returns

Event time (trading days)	Mean	*p*-value	Median	*p*-value	25th percentile	75th percentile	Standard deviation	% events positive returns
-5	-0.09%	0.604	-0.11%	0.245	-1.23%	0.95%	2.89%	46.98%
-4	-0.15%	0.307	-0.09%	0.421	-1.22%	0.91%	2.61%	46.80%
-3	0.02%	0.906	-0.08%	0.506	-1.28%	0.97%	2.75%	47.54%
-2	0.07%	0.664	0.05%	0.642	-0.98%	1.19%	2.92%	51.16%
-1	-0.11%	0.555	-0.20% *	0.076	-1.33%	1.09%	3.28%	44.56%
0	0.21%	0.240	-0.09%	0.452	-1.07%	1.24%	3.08%	47.18%
1	0.08%	0.688	-0.17%	0.137	-1.65%	1.11%	3.43%	44.59%
2	0.04%	0.793	-0.11%	0.436	-1.22%	1.07%	2.91%	46.90%
3	-0.01%	0.963	-0.06%	0.613	-1.09%	1.06%	2.84%	47.99%
4	-0.22%	0.192	-0.30% ***	0.008	-1.50%	0.80%	2.92%	40.60%
5	0.12%	0.485	-0.12%	0.330	-1.21%	1.28%	2.87%	48.50%

Panel B: Market-adjusted excess returns

Event time (trading days)	Mean	*p*-value	Median	*p*-value	25th percentile	75th percentile	Standard deviation	% events positive returns
-5	-0.05%	0.777	-0.07%	0.484	-0.99%	1.04%	2.97%	48.30%
-4	-0.04%	0.779	-0.06%	0.610	-1.20%	1.02%	2.68%	46.96%
-3	0.11%	0.496	0.01%	0.855	-1.30%	0.96%	2.79%	50.00%
-2	0.14%	0.431	0.14%	0.234	-0.85%	1.30%	3.02%	51.51%
-1	-0.04%	0.823	-0.04%	0.684	-1.32%	1.05%	3.31%	48.64%
0	0.29%	0.102	0.09%	0.407	-0.94%	1.17%	3.11%	51.00%
1	0.13%	0.516	-0.09%	0.499	-1.54%	1.13%	3.41%	47.87%
2	0.08%	0.662	-0.09%	0.435	-1.22%	1.19%	3.00%	47.06%
3	0.02%	0.895	-0.01%	0.929	-1.24%	1.09%	2.82%	49.32%
4	-0.14%	0.409	-0.12%	0.301	-1.48%	0.98%	2.98%	44.90%
5	0.12%	0.496	-0.02%	0.938	-1.24%	1.36%	2.97%	49.33%

[11] This table is inspired by Table 3 in the paper by Jenter, Matveyev, and Roth (2017), p. 29.

Appendix 2: Cumulative Abnormal Returns around Successor's Appointment[12]

This table shows cumulative abnormal returns around the announcement of a successor (t=0), which means the first date the successor is made known through either a press release or a company filing. Panel A summarizes cumulative market-model adjusted abnormal returns obtained as the sum of market-model adjusted abnormal returns. Panel B summarizes cumulative market-adjusted excess returns obtained as the sum of market-adjusted excess returns. Abnormal returns are winsorized daily at the 1% and 99% level. The *p*-values for means are calculated using robust standard errors. The *p*-values for medians are based on quantile regressions. The markers ***, **, * indicate significance at the 1%, 5% and 10% level, respectively. Sources: company filings, press releases, and DS.

Panel A: Cumulative market-model adjusted abnormal returns

Event time (trading days)	Mean	*p*-value	Median	*p*-value	25th percentile	75th percentile	Standard deviation	% events positive returns
[-2, +1]	0.19%	0.591	-0.11%	0.684	-2.44%	2.56%	6.10%	48.54%
[-2, +2]	0.19%	0.600	-0.22%	0.373	-2.48%	2.75%	6.18%	48.29%
[-2, +3]	0.21%	0.593	-0.14%	0.654	-2.54%	3.23%	6.77%	48.80%
[-2, +4]	0.05%	0.901	-0.02%	0.947	-3.07%	3.13%	6.98%	50.02%
[-2, +5]	0.13%	0.750	0.02%	0.966	-3.07%	3.54%	7.29%	51.21%
[-1, +1]	0.19%	0.541	-0.32%	0.128	-2.23%	1.96%	5.49%	46.44%
[-1, +2]	0.19%	0.548	-0.11%	0.583	-2.40%	2.07%	5.52%	47.65%
[-1, +3]	0.21%	0.547	-0.06%	0.823	-2.71%	2.46%	6.14%	48.79%
[-1, +4]	0.05%	0.887	-0.12%	0.715	-3.12%	2.65%	6.60%	49.44%
[-1, +5]	0.14%	0.731	-0.20%	0.517	-3.16%	3.10%	6.98%	49.16%

Panel B: Cumulative market-adjusted excess returns

Event time (trading days)	Mean	*p*-value	Median	*p*-value	25th percentile	75th percentile	Standard deviation	% events positive returns
[-2, +1]	0.45%	0.203	0.13%	0.413	-2.42%	2.83%	6.08%	51.59%
[-2, +2]	0.48%	0.177	0.21%	0.461	-2.41%	2.92%	6.14%	53.26%
[-2, +3]	0.54%	0.157	0.28%	0.295	-2.39%	3.33%	6.64%	52.27%
[-2, +4]	0.47%	0.219	0.28%	0.380	-2.39%	3.36%	6.64%	52.24%
[-2, +5]	0.57%	0.154	0.03%	0.790	-2.95%	4.04%	6.93%	50.61%
[-1, +1]	0.40%	0.215	-0.27%	0.221	-2.15%	2.11%	5.55%	48.39%
[-1, +2]	0.43%	0.181	0.02%	0.788	-2.07%	2.24%	5.56%	50.76%
[-1, +3]	0.49%	0.164	0.11%	0.691	-2.07%	2.89%	6.14%	50.88%
[-1, +4]	0.42%	0.254	-0.01%	0.971	-2.38%	3.13%	6.41%	49.49%
[-1, +5]	0.52%	0.181	-0.12%	0.736	-2.90%	3.49%	6.74%	50.24%

[12] This table is inspired by Table 4 in the paper by Jenter, Matveyev, and Roth (2017), p. 30.

Appendix 3: Agency issues[13]

This table reports the results of OLS regressions for different event windows, where t=0 is the announcement date of a director's death. The announcement date is the first date the death is made known through either a press release or a company filing. The dependent variables in Panel A are the free cash flows and the dividends yield. The dependent variables in Panel B are cumulative abnormal returns and excess returns. Cumulative abnormal returns (CAR) are obtained as the sum of market-model adjusted abnormal returns. Excess returns obtained as the sum of market-adjusted excess returns. Free cash flows, dividends yield, and abnormal returns are winsorized at the 1% and 99% level. The *p*-values for means are calculated using robust standard errors and shown in parentheses. Family is a dummy variable that equals one when the deceased director and the successor are family relative and zero otherwise. Free cash flows represent free cash flows per share (WC05507) built by cash earnings per share, net of capital expenditures and total dividends paid of the company. Dividends yield (DY) is dividend per share as a percentage of the share price. Industry fixed effects consider the Fama/French five industry classification. Country fixed effects consider the 28 countries in the sample. Year fixed effects considers the 21 event years in the sample. The markers ***, **, * indicate significance at the 1%, 5% and 10% level, respectively. Sources: company filings, press releases, BX, WS, and DS.

Panel A: Family

Dependent variable	Free Cash Flows	Dividends Yield
Family	0.160	0.303
	(0.910)	(0.490)
Observations	550	298
R^2	0.543	0.236
Industry fixed effects	yes	yes
Country fixed effects	yes	yes
Year fixed effects	yes	yes

Panel B: Free Cash Flows and Dividends

Dependent variable	CAR		Excess Returns	
Event window in trading days	[-1, +1]	[-1, +2]	[-1, +1]	[-1, +2]
Free Cash Flows	0.000%	-0.007%	0.009%	-0.003%
	(0.998)	(0.669)	(0.565)	(0.858)
Dividends yield	-0.147%	-0.010%	-0.169%	-0.031%
	(0.269)	(0.943)	(0.216)	(0.823)
Observations	249	249	247	247
R^2	0.272	0.306	0.210	0.214
Industry fixed effects	yes	yes	yes	yes
Country fixed effects	yes	yes	yes	yes
Year fixed effects	yes	yes	yes	yes

[13] This table inspired by Table 3 in the paper by Schmid, and Urban (2017), p. 39.

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Declaration of Academic Integrity

Hereby, I declare that I have composed the presented paper independently on my own and without any other resources than the ones indicated. All thoughts taken directly or indirectly from external sources are properly denoted as such.

This paper has neither been previously submitted to another authority nor has it been published yet.

Place, Date

Signature