Essays on Family Firms

Zhou, Haoyong

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Haoyong Zhou

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"The Doctoral School of Economics and Management is an active national and international research environment at CBS for research degree students who deal with economics and management at business, industry and country level in a theoretical and empirical manner".

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Summary

The dissertation examines corporate performance and capital structure of family firms, contributing to the limited empirical research on family firms. Family firms are prevalent in national economies all over the world. It is the prevalence that makes family firms receive increasing attentions from academia. The dissertation consists of an introduction and three chapters. Each chapter is an independent paper. The first chapter is a joint work with Professor Morten Bennedsen and Dr. Markus Ampenberger. The version of in the dissertation will be published as Chapter 6 in the forthcoming *Oxford Handbook of Entrepreneurial Finance* by Oxford University Press. The second paper and third paper are single-authored papers.

In the first chapter, we discuss the capital structure of family firms, with a focus on the debt-equity mix. Two parts comprise the chapter. In the first part, we provide a literature review on existing theoretical and empirical research in the capital structure of family firms. The literature review shows that the most important theories to explain capital structure in family firms seem to be risk aversion, agency theory, and control considerations. We argue that risk aversion and control considerations have opposing impacts on the optimal choice of debt leverage of family firms. On one hand, controlling families of family firms are typically non-diversified investors with most of their wealth and human capital tied to the company and consequently family firms use less debt. On the other hand, controlling families want to maintain the control over their companies. This control consideration restricts the willingness to raise new equity outside the family and therefore often lead to a stronger dependence on banks and other debt instruments. The literature review also shows that evidence on capital structure choices of family firms is inconclusive. Large-scale evidence on private family firms is almost missing.

In the second part of the chapter, we provide an empirical analysis of the leverage of family firms in Denmark, using an informative dataset covering around 200,000 private and public Danish firms. We find that family firms are less leveraged than non-family firms, regardless of which type of family firms. Over the past ten years, there has been a significant decline in the leverage of all firms, both family and non-family firms in Denmark. While small firms have the lowest leverage, entrepreneurial firms have the highest. We conclude that the unique characteristics of family firms, such as risk aversion and control considerations, rather than differences in other firm-specific characteristics are responsible for the lower levels of leverage on average in family firms.

Building on the findings of the first chapter, the second chapter examines whether family firms, with lower leverage, are better performers during the current global financial crisis. I construct a dataset covering firms from S&P 500 (US), FTSE100 (UK), DAX 30 (Germany), CAC 40 (France), and FTSE MIB 40 (Italy) during the period of 2006-2010. I find that broadly defined family firms do not outperform non-family firms during the crisis. However, family firms with founder presence (as CEO, a board member or a significant owner) outperform non-family firms in Operating Return on Assets (OROA). Tobin's Q and risk-adjusted Alpha of founder firms, by contrast, do not exhibit any difference. I ascribe the attenuation of the market value premium of founder firms to high volatility of stock prices and investors' overreaction during the crisis. Further research shows that during the global financial crisis, founder firms invest significantly less and have better access to the credit market than non-family firms. My analysis suggests that the superior performance of founder firms is largely caused by less incentive to invest in risky projects with a high likelihood of failure in order to boost earnings during the crisis. Furthermore, my results reveal that founder firms bear the least agency costs,

and that Tobin's Q and Alpha may not be the most appropriate measures of corporate performance during the financial crisis.

The third chapter investigates the relationship between firm performance (overwhelming majority of the sample is family firms) and a common family event--divorce. The chapter shows that divorce has a significant effect on economic outcome of an organization, in addition to its widely-documented impact on individuals. Using the same dataset in the first chapter, which covers almost all Danish private firms and CEO personal and family information (like CEO's marriage history), I evaluate the economic consequence of CEO divorce on the firm he helms. The results show that firms subsequently underperform after CEO divorces, both relative to previous performance and relative to non-divorce firms. The negative effect of divorce is consistent whether I adopt all non-divorce firms or matched non-divorce firms as control. I use nearest neighbor propensity score matching to construct the control group of matched non-divorce firms. My empirical results further suggest that marital conflict between the divorcing couple serves as one channel through which divorce strikes firm performance.

Dansk resume

Afhandlingen undersøger familieejede virksomheders finansielle struktur og generelle præstation. Familieejede virksomheder udgør i dag en væsentlig del af de respektive nationale økonomier verden over. Dette har resulteret i en stigende akademisk interesse og denne afhandling søger dermed at bidrage til den begrænsede empiriske research indenfor området 'Familieejede virksomheder'.

Afhandlingen består af en introduktion efterfulgt af tre kapitler, som hver kan læses selvstændigt. Det første kapitel er udført i samarbejde med Professor Morten Bennedsen og Dr. Markus Ampenberger. Kapitlet i denne dissertation vil blive udgivet som Kapitel 6 i den kommende "Oxford Handbook of Entrepreneurial Finance" ved Oxford University Press. Andet og tredie kapitel er selvstændig arbejde af undertegnede.

I det første kapitel diskuteres familieejede virksomheders finansielle struktur, med særligt focus på forholdet mellem gæld og egenkapital. Kapitlet består af to dele: i den første del gennemgås den eksisterende forskningslitteratur som omhandler teoretiske og empiriske undersøgelser af finansiel struktur i familieejede virksomheder. Litteraturstudiet viser at de væsentligste elements i familieejede virksomheders finansielle struktur udgøres af modvillighed til at løbe risici, Agency Theory og overvejelser omkring kontrol af virksomheden. Vi argumenterer for at risikoaversion og kontrolstrategier har modsatrettet indflydelse på det optimale niveau af gæld. På den ene side er den kontrollerende familie bag en familieejet virksomhed typisk en investor hvis resourcer hovedsageligt er bundet til firmaet, hvilket medfører at familieejede virksomheder generelt har mindre gæld. På den anden side ønsker disse familier at bevare kontrollen over firmaet, hvilket leder til en villighed til at rejse nye midler udenfor aktiemarkedet og dermed netop medfører en større grad af afhængighed af banker og

andre finansielle kilder. Litteraturstudiet afslører endvidere at man endnu ikke har dannet et homogent billede af familieejede virksomheders finansielle struktur, og at større undersøgelser af unoterede familieejede virksomheder er så godt som ikke-eksisterende.

I kapitlets anden del foretager vi en empirisk analyse af danske virksomheders gældsniveau, på baggrund af data fra ca. 200.000 unoterede og noterede danske virksomheder. Igennem de sidste ti år har der været et generelt, signifikant fald i alle virksomheders gældsniveau, både blandt familieejede og ikke-familieejede. Medens små virksomheder har det laveste gældsniveau, har nystartede virksomheder det højeste. Vi konkluderer at det er et af de familieejede virksomheders særpræg at risikoaversion og kontrolstrategier, snarere end andre virksomhedsspecifikke problemstillinger, ligger til grund for familieejede virksomheders generelt lavere niveau af gæld.

I andet kapitel undersøges, med udgangspunkt i undersøgelserne fra Kapitel et, hvorvidt familieejede virksomheder med deres lavere gældsniveau har klaret sig bedre i den nuværende, globale, økonomiske krise. Jeg har konstrueret en database, som dækker virksomheder fra S&P 500 (USA), FTSE100 (England), DAX 30 (Tyskland), CAC 40 (Frankrig) og FTSE MIB 40 (Italien) gennem perioden 2006-2010, og påviser at familieejede virksomheder generelt ikke har klaret sig bedre end andre virksomheder under krisen. Dog viser tallene at familieejede virksomheder med en aktivt deltagene grundlægger, som administrerende direktør, bestyrelsesmedlem eller væsentlig medejer, har klaret sig bedre end andre typer virksomheder i forhold til afkast fra aktiver (OROA). Tobin's Q og risikotilpasset Alpha af grundlæggerkontrollerede virksomheder viser derimod ingen forskel. Jeg tilskriver dette at grundlæggerkontrollerede virksomheders højere værdi på aktiemarkedet gradvist forsvinder med aktieprisers højere volatilitet, samt til investorers over-reaktioner under krisen. Undersøgelserne

viser at grundlæggerkontrollerede virksomheder har investeret betydeligt mindre, og har bedre adgang til kreditmarkedet, end andre former for virksomheder. Min analyse åbner for muligheden for at grundlæggerkontrollerede virksomheders bedre resultater hovedsageligt skyldes en mindre tilskyndelse til investeringer i risikable men potentielt meget profitable projekter i forsøget på at skaffe kapital under en økonomisk krise. Analysen viser endvidere at grundlæggerkontrollerede virksomheder har færre udgifter til Agency Costs, og at Tobin's Q og Alpha ikke er optimale redskaber til at måle virksomheders præstationer under en økonomisk krise.

I tredie kapitel undersøges forholdet mellem virksomhedspræstation, ud af en gruppe hvoraf hovedparten består af familieejede virksomheder, og en stadigt hyppigere forekommende familiebegivenhed: Skilsmisse. Analysen påviser at skilsmisser har en betydelig effekt på organisationens økonomiske resultater, udover den specifikke påvirkning af de involverede enkeltpersoner. Udfra det samme sæt data som blev benyttet i Kapitel et, hvilket dækker næsten alle danske privatejede virksomheder, og inkluderer personlig og familierelateret information om administrerende direktører såsom ægteskabshistorie, foretages en vurdering af de økonomiske konsekvenser af en administrerende direktørs skilsmisse for den virksomhed han eller hun bestyrer. Undersøgelserne viser at virksomhederne opnår dårligere resultater efter en administrerende direktørs skilsmisse, både i forhold til egne tidligere resultater, og i forhold til andre typer virksomheder under samme omstændigheder. Skilsmissens negative effekt er konsekvent, uanset om jeg bruger alle ikke-skilsmisseramte virksomheder eller udvalgte ikke-skilsmisseramte virksomheder som kontrolgruppe (jeg benytter Nearest Neighbor Propensity Score Matching under konstruktionen af en kontrolgruppe af udvalgte ikke-skilsmisseramte

virksomheder). Resultaterne af mine empiriske undersøgelser viser endvidere, at konflikt mellem skilsmisseparterne udgør en type gennem hvilken skilsmissen rammer virksomhedens præstation.

Introduction

Family firms occupy a large proportion of national economies around the world (LaPorta et al., 1999; Anderson and Reeb, 2003; Klein, 2000; Morck and Yeung, 2003). In Asia and Western Europe, family firms play a predominant role in listed firms (Claessens et al., 2000; Faccio and Lang, 2002; Bennedsen and Nielsen, 2010). Despite increasing attentions to family firms by researchers, empirical studies on family firms are still limited and challenging. There are mainly two reasons. First, restricted data availability, especially in private family firms, makes large scale analysis difficult. Second, no definition of family firms is widely-accepted (Bennedsen et al, 2010). Empirical results are sensitive to heterogeneous definitions of family firms.

The dissertation addresses these two problems by using informative Danish and international datasets and incorporating various definitions of family firms into analyses. The dissertation contributes to the limited empirical literature of family firms and deepening our understandings of the characteristics and behaviors of family firms.

The first chapter of the dissertation discusses the capital structure of family firms. The chapter begins with a literature review on existing theoretical and empirical research in the capital structure of family firms. We point out that risk aversion, agency theory, and control considerations are the most important theories to explain capital structure in family firms. We argue that risk aversion and control considerations have opposing impacts on the optimal choice of debt leverage of family firms. On one hand, controlling families of family firms are typically non-diversified investors. Most of their wealth and human capital are bounded to their companies. Therefore, less debt is adopted to avoid financial distress. On the other hand, controlling families have strong incentive to maintain family control over their companies. The control considerations prevent family firms from issuing new equity to outsiders and therefore often

result in stronger dependence on debt financing. The literature review also shows that evidence on capital structure choices of family firms is mixed and inconclusive. Large-scale evidence on private family firms is almost missing.

Next, we present an empirical analysis of the leverage of family firms in Denmark, using an informative dataset covering around 200,000 private and public Danish firms. We find that family firms are less leveraged than non-family firms, independent of which type of family firms we define: (1) family owned firms, where one or multi members from the same family together hold more than 10 percent of outstanding shares; (2) CEO/owner family firms, where the CEO is simultaneously a significant shareholder (at least 5 percent); and (3) CEO family succession firms, where there has been at least one CEO family succession in the firm. Over the past decade, there has been a significant decline in the leverage of all firms, both family and non-family firms in Denmark. This development is attributable to the tax policy of the Danish government to reduce the tax shield associated with debt financing. We further find that small firms have the lowest leverage and entrepreneurial firms have the highest. Our results indicate that unique features of family firms like risk aversion and control considerations, rather than differences in other firm-specific characteristics account for the lower levels of leverage in family firms

Since the inception of family firm research, one central question is whether family firms are an effective organizational form. The second chapter provides new evidence examining whether family firms are superior performers during the global financial crisis heralded by the bankruptcy of Lehman Brother in 2008. I construct a dataset covering firms from S&P 500 (US), FTSE100 (UK), DAX 30 (Germany), CAC 40 (France), and FTSE MIB 40 (Italy) during the period of 2006-2010, In my study, I define four types of family firms: (1) founder firms, where the founder/founders of the firms holds/hold a position/positions as a board member, CEO, or a

blockholder (at least a 5 percent shareholding). (2) heir firms, where the heir/heirs (by blood or by marriage) of the founding family holds/hold a position/positions either as a board member, CEO, or a blockholder; (3) family-owned firms, where one or several members from the same family hold more than 10 percent of the outstanding shares; and (4) leader/owner firms, where the CEO or a board member is simultaneously a blockholder.

I find that broadly defined family firms do not outperform non-family firms during the crisis. However, founder firms outperform non-family firms by 18 percent in Operating Return on Assets (OROA). Tobin's Q and risk-adjusted Alpha of founder firms, by contrast, do not exhibit any difference. I interpret the attenuation of the market value premium of founder firms as the result of high volatility of stock prices and investors' overreaction during the crisis (Veronesi, 1999; Glode *et al.*, 2010). Further research shows that during the global financial crisis, founder firms invest less and enjoy better access to the credit market. I explain the outperformance of founder firms in OROA as follows: The CEOs of non-family firms are myopic and have more incentive to over-invest in risky projects to boost current earnings under the pressure of managerial dismissal when stock prices slump in harsh economic conditions. Unlike non-family firms, founder firms aim to keep a sustainable growth for their young firms. They are more long-term oriented and take a more conservative investment strategy during the crisis. Risky projects, especially those financed by short-term debt, are most likely to fail with financial constraints. Therefore, over-investment with insufficient financing resources leads to project failure and further underperformance of non-family firms relative to founder firms because of a dry-out of bank loans during the crisis. Heir firms are very similar to non-family firms. After several generations, the firms with strong family characteristics in their early stage gradually develop into professionally-managed firms. It is likely that the CEO in an heir firm is not from the

founding family. Like professionally-run non-family firms, heir firms are likely to suffer from the same myopic investment strategy to boost current earnings. Family-owned and leader/owner firms are mature corporations. They may not focus on the growth opportunities as much as founder firms do in the early stage of the founder firms. During the crisis, the controlling family or individual has more incentive than the founder to over-invest to boost short-term earnings, as the family or individual needs to rapidly recover loss in the capital market. As a result, the family-owned firms and leader/owner firms underperform the founder firms because of their over-investment.

My results reveal that founder firms bear the least agency costs, and that Tobin's Q and Alpha may not be the most appropriate measures of corporate performance during the financial crisis.

Family firms feature intertwinement of business and family (Lansberg, 1988; Shama, 2004). The characteristics, events and interactions of multi-stakeholders in the controlling family might have an impact on the decision-making and other outcomes of family firms by means of ownership structure, management and governance (Astrachan et al., 2002). However, empirical research is limited. The third chapter of the dissertation aims to contribute to the literature of family firms by estimating the economic consequence of a family event -- CEO divorce on the firm he helms. This chapter uses the same Danish dataset as the first chapter. The dataset covers almost all the Danish firms' CEO personal and family information (like CEO's marriage history). Family firms overwhelmingly dominate the sample.

A leading challenge of treatment (CEO divorce is the treatment) effect estimation is the endogeneity of treatment. CEO divorces are not randomly assigned to the sample. Divorce CEOs and firms might be unobservably different from non-divorce ones. If I directly compare

performance change before and after divorce years of divorce firms with that of all non-divorce firms, the estimation suffers from selection bias. I adopt several empirical methods to tackle this issue. The main identification strategy is to construct a reliable counterfactual using nearest neighbor Propensity Score (PS) matching estimator similar to the approach by Rosenbaum and Rubin (1983), Abadie and Imbens (2007) and Malmendier and Tate (2009). I first run a probit regression to predict divorce based on matching variables, which represent CEO, CEO family and firm characteristics in the pre-treatment year (one year prior to the divorce calendar year). Next, I obtain a sample of matched non-divorce firms by matching each divorce firm to a non-divorce firm, which has the closest predicted likelihood of divorce (propensity score) to the actual divorce firm.

The results show that CEO divorce has a significant negative impact on economic outcome of the firm he heads. A large body of literature documents the impact of divorce on individuals. My paper gives the first evidence showing the impact is extended to an organizational level. Firms subsequently underperform after the CEO divorce, both relative to previous performance and relative to non-divorce firms. The negative effect of divorce is consistent whether I adopt all non-divorce firms or matched non-divorce firms as control.

Next, I explore the mechanism through which CEO divorce hits firm performance. I assume that marital conflict prevails in each divorcing couple around divorce year and examine whether marital conflict strikes firm performance. I approach the task by examining the impact of joint-management (both of the divorcing couple are top managers/board members) on firm performance during the divorce period (5 consecutive year window centered by the divorce year). The fixed effect estimator proves the cost of marital conflict. An alternative interpretation

of this finding is asset expropriation or rent seeking from a self-interested spouse board member (top manager) in a shortly-cracked marriage.

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The Capital Structure of Family Firms

Markus Ampenberger, Morten Bennedsen and Haoyong Zhou

1. Introduction

Research on capital structure deals with the question of how firms finance their real investment. In this chapter we examine capital structures in closely held family firms, with a focus on the debt-equity mix. This topic is important for at least two reasons. First, family firms are the predominant organizational structure around the world. Within the past decade, several studies have shown that, outside the United States and United Kingdom, concentrated ownership structures and family capitalism are common even among listed firms (LaPorta et al. 1999; Claessens at al. 2000; Faccio and Lang 2002; Bennedsen and Nielsen 2010). Although large-scale empirical evidence is so far missing, the conventional view is that family firms are even more prevalent among closely held private firms. Second, there is currently a controversial debate within the popular press on whether family firms can better survive the financial crisis.[1] Although this is a complex issue, the firm's capital structure and its dependency on debt financing should be important determinants in answering this question. Hence it is interesting to see whether family firms in comparison to non-family firms are more or less conservative in terms of debt financing.

The chapter has two parts. In the first part we provide a brief literature review on existing theoretical and empirical research in the capital structure of family firms. We

[1] For example, see *Economist*, January 22, 2009.

argue that there are several important aspects of being a closely held family firm that have opposing impacts on the optimal choice of debt leverage. One important feature is that families are typically nondiversified investors that not only have most of their wealth tied to the company but also often their human capital. Another salient feature is that families want to have control over their company. This control objective restricts the willingness to raise new capital outside the family and therefore often results in a stronger dependence on banks and various forms of debt instruments.

In the second part we provide an empirical analysis of the leverage structure of family firms in Denmark. Using a unique data set we can track the family behind each of the 200,000 Danish firms and categorize the firms into family or non-family firms. We use three definitions of family firms in the analysis: (1) multiple family members owning the firm; (2) a family owner is also CEO; and (3) there has been at least one family succession in the firm.

Our empirical analysis derives a number of interesting results about capital structures of family firms. Family firms tend to be less leveraged than non-family firms, independent of which type of family firms. Over the past ten years, there has been a significant decline in the leverage of all firms, both family and non-family. Leverage of family firms is increasing in size but is decreasing in age. Altogether our results indicate that the unique features of families do significantly affect the choice of leverage in the firms that these families control and own.

2. Family firms and capital structure – a review of the literature

We begin this section with an overview of the main capital structure theories that are relevant in the context of family firms. Following the theoretical survey, we summarize the limited existing empirical evidence on capital structure decisions in family firms.[2]

Even after five decades of capital structure research, there is no universal theory to explain why some firms heavily use debt to finance real investment while others rely more on equity.[3] No doubt the starting point of research on capital structure is the seminal work by Modigliani and Miller (1958), who argue that in a world without capital-market frictions, financing—and thus the debt-equity-mix—is irrelevant for investment. In such a setting, the firm is a simple production function that conducts NPV-positive projects and omits NPV-negative projects.[4] However, the assumption of perfect and complete capital markets is not realistic. Instead transaction costs, taxes, information asymmetries, and agency problems between management and the suppliers of financing, among others, create frictions that are not negligible.[5]

Subsequently two major paradigms developed. The trade-off theory argues that firms balance the tax advantage of an additional unit of debt against the costs of potential financial distress (Modigliani and Miller 1963).[6] The implication of the trade-off theory is

[2] It is beyond the scope of this chapter to provide a comprehensive review of the large literature on capital structure research in general. See Harris and Raviv (1991) and Myers (2001) for two excellent surveys of this literature.
[3] Cf. Myers (2001, 2004). Sometimes this question is referred to as the "capital structure puzzle."
[4] NPV refers to net present value.
[5] The implication of this principal-agent conflict is, as Shleifer and Vishny (1997) point out, that capital providers have to ensure—by introducing a corporate governance structure—that they can realize a return on their investment.
[6] In most developed economies, interest payments are tax deductible, while dividends are not. From that Perspective, debt is more favorable than equity as long as the firm is profitable. However, a larger debt ratio increases the likelihood of bankruptcy.

that firms follow a target capital structure that is related to their preference for tax savings versus bankruptcy risk.

The other major paradigm is the pecking order theory (Greenwald et al. 1984; Myers 1984; Myers and Majluf 1984). According to this theory, firms prefer to use retained earnings, safe debt, risky debt, mezzanine-finance, and equity, in this order, to finance real investment. Since equity is both at the beginning and the end of this pecking order there is no optimal capital structure that firms follow. The implication is simply that the capital structure is the result of a number of subsequent financing events driven mainly by the firm's profitability and the need to use external financing sources for real investment.[7] While the trade-off theory recognizes market imperfections, such as taxes and costs of financial distress, the pecking order theory takes into account information asymmetries between market participants.

Family firms differ from non-family firms in some important aspects. First, the family invests a significant part of its private wealth into the family business. Hence firms become family-owned. However, as argued above, many family firms are not only family-owned but also under family management. In such a case, family members invest—in addition to their financial wealth—their entire human capital into the family firm. Both aspects can lead to risk aversion.[8] Negative firm performance, financial distress, or, in extreme cases, bankruptcy can hence be considered a total loss from the families' perspective.

Second, families have often invested in the firm for many years, if not for more than one generation, and thus family firms tend to be governed for the long term. This is

[7] A number of empirical studies have tested these two theories. See, for example, Fama and French (2002).
[8] See Berk et al. (2010) for the theoretical argument that even salaried managers become risk averse because of their large human capital investment in the firm.

related to the desire of the founder or descendents to bequeath the family business to future generations (Chami 2001; James 1999). With regard to the trade-off theory we would expect that the risk aversion and the long-term orientation lead to more conservative financing choices in family firms. Concerning the trade-off between equity and debt, risk aversion might increase the families' marginal preference for equity in comparison to debt. From this perspective, if we compare the two types of firms, we expect family firms to have lower leverage ratios than non-family firms.

Families do prefer to control their businesses.[9] If retained earnings are not sufficient to finance growth and real investment, family firms have the option of issuing equity (private equity; the larger, capital-market-oriented family businesses may also issue public equity) or using debt (from banks, credit mortgage institutes, or other creditors or by issuing corporate bonds). Hence they can choose between a dilution of their ownership stake (and hence their control) or allowing for creditor monitoring by banks. As the review of the empirical literature will show, there is contradictory evidence about which choice is dominant. While Mishra and McConaughy (1999) argue that listed family firms in the United States prefer less debt with regard to control considerations, Ellul (2008) points in the opposite direction. Based on a cross-country study of listed firms, he concludes that the presence of family blockholders is positively correlated with leverage since family owners prefer debt over equity in order to avoid a dilution of their ownership stake. Hence, from the perspective of control considerations, it remains an empirical question whether family firms have less or more leverage than non-family firms.

[9] See Villalonga and Amit (2009a) with regard to listed family firms in the United States and Bennedsen and Nielsen (2010) with respect to listed firms in Western Europe.

The third theory discussed in this context is the principal-agent theory. In his seminal paper, Jensen (1986) argues that debt is a useful mechanism to discipline management. Fixed payment of interest and principal takes away the "free cash flow" that management can use to spend on inefficient projects.[10] However, the main reason for the existence of agency costs is the separation of ownership and control. In the case of an owner-manager in the sense of Jensen and Meckling's (1976) model, agency costs are zero. The manager (who simultaneously owns 100 percent of the firm) chooses a level of effort that maximizes his utility (derived from firm value and private consumption). Given that the separation of ownership and control is less pronounced in private family firms (since the family is a large owner and often involved in firm management), there might be less need for the disciplining monitoring role of debt. From this perspective we expect leverage to be lower in family firms than in non-family firms.

Empirical Evidence

As a starter, we want to emphasize that empirical research on family firms has a comparatively short history. This is so for a number of reasons. First, with regard to publicly listed firms the idea that salaried managers rather than controlling owners are responsible for running large firms has dominated the literature since the seminal work of Berle and Means (1932). But this picture changed during the past decade. La Porta et al. (1999, 511) study ownership structures around the world and conclude, "As we look outside the United States, particularly at countries with poor shareholder protection, even

[10] See Jensen (1986) and Stulz (1990). The free cash flow hypothesis to discipline management is the main argument behind the well-known phenomenon that private equity investors change the financial structure after leveraged buyout transaction. See Kaplan and Stromberg (2009) for a review of this literature.

the largest firms tend to have controlling shareholders. Sometimes that shareholder is the State, but more often it is a family, usually the founder of the firm or his descendants." In a similar vein, Claessens et al. (2000), Faccio and Lang (2002), and Bennedsen and Nielsen (2010) show that family firms play a predominant role even among listed firms in Asia and Western Europe.

Second, with regard to private firms systematic large-scale research is difficult due to limited data availability. Consequently the majority of research in corporate finance has focused on publicly listed firms, although it is widely accepted that family firms are much more common among private firms than among listed firms.[11] From this perspective it is essential, albeit a challenge, for future research on family firms to analyze both private and listed firms.

A third obstacle to systematic research on family firms is the lack of a generally accepted definition of what constitutes a family business (Bennedsen et al.2010). Several studies show that the actual definition of a family firm does have a strong implication for the results of empirical family business analysis (see Miller et al. 2007; Villalonga and Amit 2006). Moreover a comparison of the results across different empirical studies is complicated with respect to heterogeneous definitions.

Before we summarize the limited empirical evidence on capital structure choices in family firms, we want to stress the importance of the institutional environment. Starting with the study of Rajan and Zingales (1995), a growing body of empirical literature has recently focused on cross-country determinants of capital structure choices. The early studies conclude that in general the same firm-specific characteristics that are correlated with leverage in the United States also affect capital structures in other

[11] Three notable exceptions are the studies by Bennedsen et al. (2006, 2007) and Franks et al. (2011).

developed countries (Rajan and Zingales 1995) and developing economies (Booth et al. 2001). Most recent studies argue that country-specific factors are also major determinants of firms' capital structure. They show that the development of a country's legal system and institutions (Demirgüc-Kunt and Maksimovic 2002; Fan et al. 2008) as well as the financial system of an economy (Antoniou et al. 2008) affect leverage ratios *directly* and *indirectly*; that is, the importance of certain firm-specific characteristics to explain leverage ratios varies with the institutional environment (De Jong et al. 2008).

Other authors argue that the institutional environment is not only important for listed but also for unlisted firms (Giannetti 2003; Hall et al. 2004). Unlisted firms operating in countries with less developed stock markets are more indebted (Giannetti 2003). Against this background it is interesting to note that Denmark is a civil law country (with Scandinavian origin) with a bank-based financial system and concentrated ownership structures. Denmark provides an ideal research environment in the sense that family firms are of major importance for the Danish economy. For a detailed description of the institutional environment, see our discussion below.

Empirical evidence on capital structure choices in family firms is limited. Agrawal and Nagajaran (1990) provide the starting point by arguing that listed firms in the United States with zero debt have higher managerial ownership with strong family ties in top management. They argue that managers choose zero-debt capital structures as a risk-reducing strategy: they aim to reduce the risk stemming from their undiversified investment and human capital. In a similar vein, Mishra and McConaughy (1999) show that family firms have lower debt ratios. They analyze a small sample of 105 family firms, in which the CEO is either the founder or a relative of the founder. The sample is

drawn from the population of the Business Week CEO 1000 and hence covers large listed firms in the United States. The authors use two matching samples based on industry classification and firm size: (1) an "ownership match" with a sample of firms that are characterized by similar levels of insider ownership, and (2) a "diffuse match" of widely held firms. Mishra and McConaughy find that family firms have a significantly lower leverage than non-family firms and argue that this is related to risk aversion and control considerations.

Anderson and Reeb (2003) use a panel of S&P 500 firms between 1993 and 1999 to analyze differences between family and non-family firms in terms of diversification and leverage. In contrast to Mishra and McConaughy (1999), they do not detect any differences in terms of capital structure choices between the two groups. Anderson et al. (2003) add to this literature by analyzing the costs of debt financing and the bondholder-shareholder conflict. They use information about corporate bonds of large family firms in the S&P 500 and find that family firms have lower costs of debt financing, especially if family ownership is moderate. Anderson et al. argue that the interests of founding families and bondholders are better aligned in family firms than in firms with outside shareholders or dispersed ownership because of the long-term orientation and reputation concerns of founding families.

Ellul (2008) analyzes an international data set from thirty-six countries and concludes that the presence of family blockholders leads to higher leverage ratios. Detailed evidence outside market-based economies is still limited; an exception is the study of Ampenberger et al. (2009) on Germany, a typical bank-based economy. They study a panel data set of 660 listed firms in Germany between 1995 and 2006. In

accordance with Mishra and McConaughy (1999), they find that family firms have lower leverage ratios than non-family firms. They further argue that family management is the main driver of this result. Furthermore leverage is particularly low if the founding family is a large shareholder and active in firm management at the same time. (see Table 2.1 for an overview of the empirical literature).

[Insert Table 2.1 here]

Overall our review of the empirical literature allows us to draw four main conclusions. First, country-specific aspects are important in the analysis of capital structure decisions. Second, so far there is no clear picture in the literature of whether family firms are more or less indebted than non-family firms. Third, the explanations employed by several studies are clearly related to the theories described in the previous section. In particular risk aversion, control consideration, and agency theory are the main explanations for observed differences between family firms and non-family firms in terms of capital structure choices. Fourth, large-scale evidence on private family firms is missing. This might be related to the lack of data on ownership and board structures of private family firms. Our data set on Danish firms allows us to overcome this obstacle and identify three types of family firms among both listed and unlisted firms in Denmark. Hence the aim of this chapter is to fill the research gap on capital structure choices in private family firms.

3. An Empirical Investigation of Capital Structure of Danish Family Firms

In this section we discuss the picture of capital structure of Danish family firms. We start with a brief description of the Danish corporate governance system, since previous empirical work suggests that the institutional environment is important for capital structure choices (e.g., Antoniuo et al. 2008; Giannetti 2003; Hall et al. 2004). Then we give a detailed description of our data set. Finally, we show our univariate empirical results of capital structure choices in Danish family firms.

Analyzing capital structure in Danish family firms is attractive for at least two reasons. First, similar to other larger European economies such as Germany, Denmark has a long tradition of family firms. In fact Danish family firms dominate the landscape of the national economy, and the capital structure of Danish firms is comparable to those of larger European countries (in our data set the average book leverage of Danish firms is 0.56, the same as that of German listed firms, reported by Ampenberger et al., 2009).

Second, the availability and quality of Danish data with respect to closely held firms are unique. In contrast to many other studies, this allows us to analyze capital structure decisions not only in listed but also unlisted family firms. Furthermore we are able to consider the heterogeneity of family firms and identify three different groups of family firms: family-owned firms, CEO/owner family firms, and CEO family succession firms.

In much the way the two countries are geographically close to each other, the Danish and German corporate governance systems are similar to a large extent. Belonging to a civil law institutional setting, Denmark resembles Germany in its legal

protection of investors (e.g., LaPorta et al. 1999). Unlike Anglo-Saxon economies, both countries have inactive takeover markets for corporate control. Ownership structures are highly concentrated and often family-based (Bennedsen and Nielsen 2010). In both countries, loans by banks and mortgage institutions are traditionally important financing sources for closely held firms. The bank-based character of the financial system is also reflected by the fact that only a small fraction of Danish firms is listed at the stock exchange (Lausten 2000).

Danish firms are subject to a semi-two-tier board system, with a management board and a supervisory board, regulated by Danish corporate law. While the supervisory board is responsible for disciplining top management and making significant corporate decisions, such as nominating a new CEO, the management board manages the daily operations of firms. In contrast to countries with a pure two-tier board structure (such as Germany), the members of the management board are allowed to occupy up to half of the seats in the supervisory board.

Sources of Data and Sampling Definitions

In the following we use a database covering all private and public firms in Denmark (see Bennedsen et al. 2007) in a ten-year period, from 1998 to 2007. The main body of the data set is assembled by building on three data sources:

1. Købmandsstandens Oplysningsbureau (KOB): This data set covers accounting and ownership information of all registered limited liability firms in Denmark. The data set is based on annual reports that all Danish

companies with limited liability are required to file with the Ministry of Economics and Business Affairs. The data include accounting data, information on the composition of the management board, and basic ownership structures.

2. Erhvervs- og Selskabsstyrelsen (E&S): This data set is administrated by Erhvervs- og Selskabsstyrelsen (the Danish Commerce and Companies Agency) at the Ministry of Economics and Business Affairs. It provides information on any change in the top management (CEO and board positions) of limited liability firms.
3. The official Danish Civil Registration System: The third database, administrated by the Ministry of Interior, supplies us with detailed information about kinship and family ties within the Danish population. Based on these records, we can identify the kinships of departing and succeeding CEOs and individual shareholders, which is the cornerstone to identifying three distinct groups of family firms.

An important challenge for any analysis of corporate governance mechanisms in family firms is the lack of a clear definition of what a family firm is (Bennedsen et al. 2010). Previous work has shown that the choice of the family firm definition can significantly affect the results of empirical studies (Villalonga and Amit 2006; Miller et al. 2007). One particular strength of our approach in this paper is that we are able to work with the following three overlapping definitions of family firms:

1. Family-owned firms, defined as firms in which one or several members from the same family together hold more than 10 percent of outstanding shares.

2. CEO/owner family firms, defined as firms in which the CEO is simultaneously a significant shareholder with an outstanding ownership stake of at least 5 percent.
3. CEO family succession firms, which have experienced at least one CEO succession within the family between 1993 and 2005.

Figure 3.1 shows the number of firms per year in our sample. Altogether we have around 73,000 firms in the beginning of our study and around 130,000 firms in 2006.[12] The share of family firms first increases, then falls over time, but is significant in any year in our sample.

[Insert Figure 3.1 here]

Table 3.1 provides descriptive statistics for the whole population of almost 200,000 firms in our sample.[13] Non-family firms are on average larger than family firms, with mean total assets of 358 million DKK, compared to 11 million DKK for family firms. However, the median size of family firms is similar to that of non-family firms. These results indicate a highly skewed distribution with regard to firm size, and in particular the existence of some extraordinarily large non-family firms. There is no significant difference in terms of firm age for the two groups. With respect to legal form composition, family firms are more often incorporated as ApS firms (Anpartsselskaber, limited liability companies) than non-family firms, while non-family firms use many

[12] From 2004 through 2006 Denmark experienced an extraordinary economic boom with annual GDP growth rates (nominal growth rates) of 2.3 percentage points (2004), 2.5 percentage points (2005), and 3.1 percentage points (2006; World Bank 2009). During this period the number of established businesses increased substantially with respect to new start-up firms. However, most of them are categorized into our non-family firm group. In 2007 the economic growth slowed down to a rate of 1.8 percentage points.
[13] Altogether our sample consists of an unbalanced panel of almost 200,000 Danish firms with at least one firm-year observation during the 1998–2007 period. For example, the sample size is around 73,000 in 1998 and 130,000 in 2006.

more other legal forms. Finally, both types of firms have a similar fraction of A/S (Aktieselskaber, joint stock companies) firms.

[Insert Table 3.1 here]

Empirical Results on Capital Structure Choices

We start our analysis with a cross-country comparison, using evidence on capital structures in German and Japanese family firms and non-family firms (see Figure 3.2). The data from Germany are from Ampenberger et al. (2009), while the data about Japan are from Bennedsen et al. (2011). All three countries have in common that bank financing and family capitalism are important features of the economy. Hence in terms of the institutional environment the three countries are comparable. Two aspects are important. First, by and large the level of leverage (measured as total liabilities scaled by total assets) is in the same range in the three countries. Hence although Germany and Japan are among the strongest economies worldwide and much larger than the Danish economy in terms of GDP, the financing mix of debt and equity seems to be similar in the three countries. Second, the differences between family firms and non-family firms are the largest in Germany, followed by Denmark. In both countries family firms are less indebted than non-family firms. However, in Japan family firms and non-family firms seem to have relatively similar leverage. Overall this cross-country comparison suggests that despite being a small country, Denmark provides a good and representative economic setting for the analysis of capital structure decisions in family firms, at least for countries

with a bank-based financial system. However, the comparison suffers from definition inconsistency regarding family firms.

[Insert Figure 3.2 here]

Figure 3.3 shows the evolution of capital structure of Danish family firms and non-family firms in greater detail. The graph shows two interesting results. First, leverage is declining over time for both groups. The decrease is related to the Danish corporate tax policies over the years. Corporate tax rate has been reduced by 20 percent since 1989 (Skat 2003), and interest deduction caps were introduced twice, in 1998 and 2007. The tax policy of the Danish government has reduced the value of the tax shield over time, and as a result it is less attractive for Danish firms to be highly leveraged.

For our analysis the most striking insight from Figure 3.3 is that family firms are clearly less leveraged than non-family firms. This result holds for all years in our sample, and the difference varies from almost 0.3 percentage points (in 1998) to almost 7 percentage points (in 2007).

The result is consistent with the view that families are more exposed to financial risk with respect to their undiversified ownership stakes. As a consequence, in comparison to other types of controlling owners, families may optimally choose a lower degree of risk that is reflected in lower leverage ratios of the firms they control and own.

[Insert Figure 3.3 here]

The result is also consistent with families' strong desire to be in complete control. High levels of leverage typically would imply stronger monitoring and more negotiations with banks, mortgage credit institutes, and other debt providers. With regard to their control considerations, families want to avoid strong creditor monitoring and may therefore end up choosing a lower leverage level.

An interesting observation is that the leverage of family firms decreases more over time than the leverage of non-family firms. We do not see any clear explanation of this trend. However, although all firms reduce their target leverage with respect to the decreasing attractiveness of the tax shield, non-family firms were overall more aggressive in using debt to finance new activities in this period of strong economic growth.

In a second step, we distinguish between the three groups of family firms. Figure 3.4 shows all Danish firms (family and non-family firms) in comparison to the three subgroups of family firms (family-owned firms, CEO/owner firms, and CEO family succession firms). As we can observe, all the three groups follow similar capital structure patterns; that is, their leverage decreases over time. In this sense, it seems that all three groups of family firms are similar. In 2007, which is the last year of the observation period, family-owned firms and CEO family succession firms have a debt ratio of 0.443 and 0.475, respectively, while CEO/owner family firms have a ratio of 0.460.

[Insert Figure 3.4 here]

The main point is that the differences between the three groups are small and there is no clear-cut evidence that any of the subgroups has a particularly low or high leverage. However, the more detailed depiction supports the view that by and large

family firms have less leverage in comparison to non-family firms and that leverage decreases over time. Regarding the subgroup of family succession firms, we have also analyzed the effect of succession and found that the leverage ratio decreases around the succession event (unreported results). However, without any further analysis we doubt that this is a causal effect, as the overall leverage in Danish firms is declining in a similar manner during our observation period. Hence our analysis seems to reflect the time trend of decreasing leverage rather than a causal effect of within-family succession.

So far we have argued that the different governance structure and unique characteristics of family firms are important determinants of capital structure choices in Danish firms. However, such decisions might also be driven by other firm-specific characteristics. For that reason we test the robustness of our results by analyzing the impact of the legal form, firm size (measured by total assets), firm age, and industry affiliation.

In Figure 3.5 we divide the three different subsamples of family firms into two groups according to their legal form: A/S firms and ApS firms. A/S firms can be listed firms, but ApS firms cannot. The figure shows us that in general A/S firms have higher leverage ratios than ApS firms. In Denmark the legal requirements to establish A/S firms are stricter with respect to minimum capital requirements and the implementation of corporate governance mechanisms. One explanation for the difference in leverage may be that A/S firms are on average larger than ApS firms and in general have to offer more fixed assets as collateral.

[Insert Figure 3.5 here]

Firm size might be a major determinant of capital structure decisions. To investigate this issue in more detail we used firm size to divide the population of family firms and non-family firms in three groups of equal size. (We used the 33.3rd percentile and 66.7th percentile in firm size to build three groups: small firms, medium-size firms, and large firms.) Figures 3.6 and 3.7 show the results for family and non-family firms. Among the non-family firms (Figure 3.7), the smallest have the lowest leverage ratio, followed by medium and large firms. If larger firms have a higher creditworthiness, more tangible assets as collateral, and better access to debt markets, this result is exactly expected. The comparatively low leverage of small non-family firms might be an indication that especially the smaller firms in Denmark face financial constraints and have a limited access to debt markets.

With regard to family firms, the picture is somewhat different: while the group with the smallest firms still has the lowest leverage, the differences between the three groups in terms of debt-equity ratio are much smaller. Moreover the medium-size firms and not the largest firms are most indebted. This somewhat surprising result might be related to the fact that family firms are on average smaller than non-family firms. Furthermore the variance in firm size in this group is much lower than the variance in firm size among non-family firms. For example, non-family firms have a mean firm size (measured by total assets) of 358 million DKK, while the median firm size is 3 million DKK. In comparison, family firms have mean total assets of 11 million DKK and median total assets of 3 million DKK. This shows that the skewness of the distribution in firm size is much higher among non-family firms than among family firms. Hence if firm size is a major determinant of capital structure it is more likely to produce stronger differences

in terms of capital structure choices between the three subgroups of non-family firms (according to firm size) than among the family firms.

[Insert Figures 3.6 and 3.7 here]

As for the effect of firm age on leverage (Figures 3.8 and 3.9), we find that entrepreneurial firms (established after 1990) have the highest leverage, followed by young firms (established after 1980). This is true for both family and non-family firms. Middle-aged and old firms (established before 1980 and 1945, respectively) do not show much difference in terms of leverage. The result might be surprising at first glance, but we have used very broad ranges to define the four groups of firms according to their age. For example, the entrepreneurial firms were established after 1990 and hence cover a heterogeneous group of firms themselves. They do not only consist of start-up firms that usually lack tangible assets, a cash-flow history, and borrowing capacity. In this sense the age might be a proxy for the maturity of the sample firms. Hence entrepreneurial and younger firms might grow stronger than the other two groups and have greater need for external capital. This might be reflected in higher leverage ratios if compared to the other two groups of older firms. Moreover the differences in terms of leverage among the four groups are not very large, indicating that firm age—at least measured in these broad ranges—does not have a strong impact on capital structure decisions.

[Insert Figures 3.8 and 3.9 here]

Leverage ratios show a significant variation across industries. For example, Frank and Goyal (2009) analyze capital structures of listed firms in the United States and conclude that firms operating in industries in which the median firm has a high leverage tend to also prefer high debt levels. This might be related to common competitive forces within the industry. Figure 3.10 shows the leverage ratios of family and non-family firms in Denmark across different industries in the year 2007. We used a broad industry classification with eight industries. The figure confirms that there are strong differences in terms of leverage ratios across industries. For example, while construction has particular high leverage ratios, firms in the finance and business activities sectors have a comparatively low leverage. Overall there is no consistent pattern over all industries: within some industries, such as finance and business activities, family firms have on average lower leverage ratios than non-family firms, while in other industries, such as electricity, gas, and water supply, family firms have on average higher leverage than non-family firms. Recently Villalonga and Amit (2009b) have argued that family firms are not randomly assigned across industries, but are more likely to control certain industries. With regard to their finding, one concern with our analysis is that family firms are overrepresented in low-leverage industries and underrepresented in high-leverage industries. However, we find that the industry distribution of family and non-family firms is similar. Although industry affiliation is certainly a major determinant of capital structure, our results—that family firms on average have lower leverage ratios than non-family firms—are not driven by an over- or underrepresentation of family firms in certain industries.

[Insert Figure 3.10 here]

Our descriptive robustness tests suggest that family characteristics (and not the legal form, firm size, firm age, or industry affiliation) are driving the lower leverage in family firms. To gain better insight in terms of the relationship between capital structure and bankruptcy, it would be interesting to know how the number of bankruptcies is distributed among family and non-family firms. However, we do not have clear-cut information on bankruptcy filings in our database. As a proxy, we have analyzed the number of firm exits in our panel data set. We find that indeed the relative number of exits is on average higher in non-family firms than in family firms. Over the 1998–2006 period (before the financial crisis), the average exit rate among non-family firms is 6.53 percent p.a. By contrast, the relative number of family firms that leaves the sample is on average only 4.44 percent p.a. between 1998 and 2006. This provides preliminary evidence that the more conservative financing policies in family firms are correlated with a lower number of bankruptcies. Some caveats remain to this simple comparison. First, we do not know whether an exit is indeed related to a bankruptcy case or instead has other reasons (e.g., mergers and acquisitions). Second, only a multivariate analysis can show whether the potential differences really exist among family and non-family firms in the relationship between leverage and bankruptcies. Third, the causality between capital structure and bankruptcies is unclear. Does higher leverage among non-family firms lead to more bankruptcies relative to family firms? Or do non-family firms have higher leverage ratios because of a larger number of bankruptcies? It goes beyond the scope of this chapter to analyze these questions in detail. However, this is certainly an interesting area for future research.

As a final robustness check we identify sixty-two family firms from the subgroup of CEO/owner family firms that experienced a transition from a family firm to a non-family firm. Instead of passing the firm to their heirs, the family transfers 100 percent of their ownership stake to outside investors. Figure 3.11 shows the development of the leverage ratio five years before and after the transition. The figure shows that the leverage ratio is increasing by about 5 percentage points (from 61 to 66 percent) within the five years before and after the transition. This is another indication that common characteristics of family firms, such as lower agency costs, risk aversion, and control considerations, have a strong impact on the capital structure choices of closely held family firms.

[Insert Figure 3.11 here]

4. Concluding remarks

Our discussion of capital structure choices in family firms is based on a review of relevant capital structure theories and the limited existing empirical evidence. We provided empirical evidence on capital structure decisions in both listed and unlisted family firms in Denmark, an economy where family firms traditionally are a predominant organizational form.

The literature review shows that among the multitude of capital structure theories, the most important ones to explain leverage ratios in family firms seem to be risk aversion, agency theory, and control considerations. However, the literature review also shows that even after a decade of research there is still inconclusive evidence on capital structure choices in family firms. Large-scale evidence on private family firms is missing

almost entirely. Moreover the literature to date neglects the fact that empirical results depend largely on how a family business is defined and that family businesses themselves constitute a heterogeneous group of firms.

In part, we can overcome this obstacle and provide an empirical analysis based on a large data set of 200,000 Danish firms. While our data set also covers listed firms, the majority of the firms are unlisted, closely held firms in Denmark. In particular, we consider the heterogeneity of family firms by identifying three different groups of family businesses: family-owned businesses (where one or several members from the same family together hold more than 10 percent of outstanding shares), CEO-owner firms (where the CEO is at the same time a significant shareholder), and CEO family succession firms (based on the succession of family members). We find that closely held family firms have significantly lower leverage compared with non-family firms. This result is consistent for all three groups of family firms with different definitions, and can be explained by trade-off theory, risk aversion, and control considerations.

Moreover we can show that leverage ratios among Danish firms are declining over time. This development, which is true for both family and non-family firms, is related to the tax policy of the Danish government. In comparison to debt, equity became more attractive during the past decade because the Danish authorities systematically reduced the tax shield associated with debt financing. Consequently Danish firms strengthened their equity ratio significantly.

Firm legal forms, sizes, and ages do affect the choice of capital structure in family firms. We show that whereas small firms have the lowest leverage, entrepreneurial firms have the highest. Danish joint stock companies (A/S) are more leveraged than limited

liability companies (ApS). In addition, leverage ratios exhibit a large variance across industries. However, in terms of industry distribution, we do not find significant differences between family and non-family firms in our sample. Our robustness tests lead us to conclude that the unique characteristics of family firms, such as risk aversion and control considerations, rather than differences in other firm-specific characteristics are responsible for the lower levels of leverage on average in closely held family firms.

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Morten Bennedsen is the André and Rosalie Hoffmann Chair of Family Business Management and Professor in Economics at INSEAD. Morten Bennedsen's main research area is the governance of family firms and other closely held corporations. He has done research on family firms, closely held corporations, capital structure, venture capital, investor protection, ownership structures and privatization. His work has been published in many top finance and economics journals such as, the *Journal of Political Economy*, the *Quarterly Journal of Economics* and the *Journal of Financial Economics*, among others. He has a Ph.D. in economics from Harvard University, a Master Degree with Distinction from the London School of Economics and a Bachelor of Arts from the University of Copenhagen.

Haoyong Zhou is a PhD fellow in the Department of Economics at Copenhagen Business School. His research area focuses on corporate finance, corporate governance and family business. During his PhD studies, he has been a visiting researcher at INSEAD. He holds a Master degree of Economics from University of Copenhagen and a Bachelor degree of Chemical Engineering from China.

Markus Ampenberger is a research fellow at the Center for Entrepreneurial and Financial Studies (CEFS) at Technische Universität München. His main areas of research are corporate governance, family firms and venture capital. During his doctoral studies he has been a Visiting Fellow at Harvard University and he holds a Master Degree in Business Administration from Colorado-State-University and a diploma in business economics from Ludwig-Maximilians-Universität in Munich. In 2009, he earned a doctoral degree from Technische Universität München.

Table 2.1 Summary of Empirical Studies on Capital Structures in Family Firms

Author	Sample	Data Sources	Method of Analysis	Summary of Findings
Agrawal and Nagajaran (1990)	71 listed U.S. firms without any debt (all-equity firms) matched with 71 indebted firms with similar industry affiliation and firm size	Firms' proxy statement (ownership and board structures), Compustat (accounting information)	Descriptive analysis	Firms without debt have on average higher managerial ownership than comparable indebted firms. The results are statistically significant if there are kinships between members of top management or between top management and important shareholders, but insignificant for high managerial ownership without such kinships.
Mishra and McConaughy (1999)	105 U.S. family firms and two matched samples with 105 widely held firms and 105 firms with similar levels of insider ownership	The CEO Business Week 1000 (identification of family firms), accounting data from 1986 and 1987 (average values)	Multivariate cross-sectional analysis (OLS-regression)	Family firms have lower leverage than non-family firms. The comparison with the two matched samples shows that this is a real family firm effect rather than an insider ownership effect.
Anderson and Reeb (2003)	319 industrial firms from the S&P 500 in the 1993– 1999 period (2,108 firm-year observations)	Firms' proxy statement (ownership and board structures), Gale Business Resources, Hoovers, press research (company founders), Compustat (accounting information)	Descriptive analysis, multivariate panel regression analysis (pooled OLS, logit-models)	There is no difference between family and non-family firms in terms of leverage.
Anderson et al. (2003)	252 industrial firms from the S&P 500 from 1993 to 1998 (1,052 firm-year observations)	Lehman Brothers bond database (information about bonds), firms' proxy statement	Descriptive analysis, multivariate analysis	Founding family ownership reduces the cost of debt. In particular, family firms enjoy a 32 basis points lower cost of debt financing relative to non-family

		(ownership and board structures), Gale Business Resources, Hoovers, press research (company founders), Compustat (accounting information)		firms. Moderate family ownership up to 12% provides the strongest value gains, while costs of debt increase if family ownership is larger than 12% (but costs of debt are still lower than in non-family firms). Founding families are a unique shareholder category, with long-term commitment, undiversified portfolios, and reputation concerns. These aspects appear to reduce agency costs between shareholder and bondholder, resulting in lower costs of debt financing.
Author	Sample	Data Sources	Method of analysis	Summary of findings
Ellul (2008)	3,608 listed firms from 36 countries in the 1996–2004 period	Faccio and Lang (2002) data set, U.S. Fortune 500 firms (as in 1994), non-European DRs (in 1994), 20-F forms and proxy statement, Amadeus database (ownership and board structure), Compustat and Worldscope (accounting data)	Multivariate panel regression analysis (OLS-, firm-fixed effects-models)	Family blockholders have a positive impact on leverage. The influence of family blockholders is stronger in countries with weak investor protection. Family blockholders prefer debt over equity to receive external finance in order to avoid a dilution of voting rights. Families are found to use leverage in a strategic way. They use it less when (a) they possess control-enhancing mechanisms, and (b) when their stake is high enough to allow them to have control anyway.
Ampenberger et al. (2009)	660 listed firms from Germany in the 1995–2006 period (5,135 firm-year observations)	Hoppenstedt Aktienführer (ownership and board structures), Hoovers Company Profile, press research (founder information),	Descriptive analysis, multivariate panel regression analysis (pooled OLS, between-estimates, firm-fixed-effects models), propensity	Family firms have lower leverage ratios driven by family management rather than family ownership. A transition from a family firm to a non-family firm leads to a significant increase in leverage. These results seem to be related to agency and control

		Worldscope and Datastream (accounting data)	score-based matching	theory. In particular, in a bank-based economy, founding families may balance the dilution of their voting rights from external equity against strong creditor monitoring by banks rather then just prefer debt over equity.

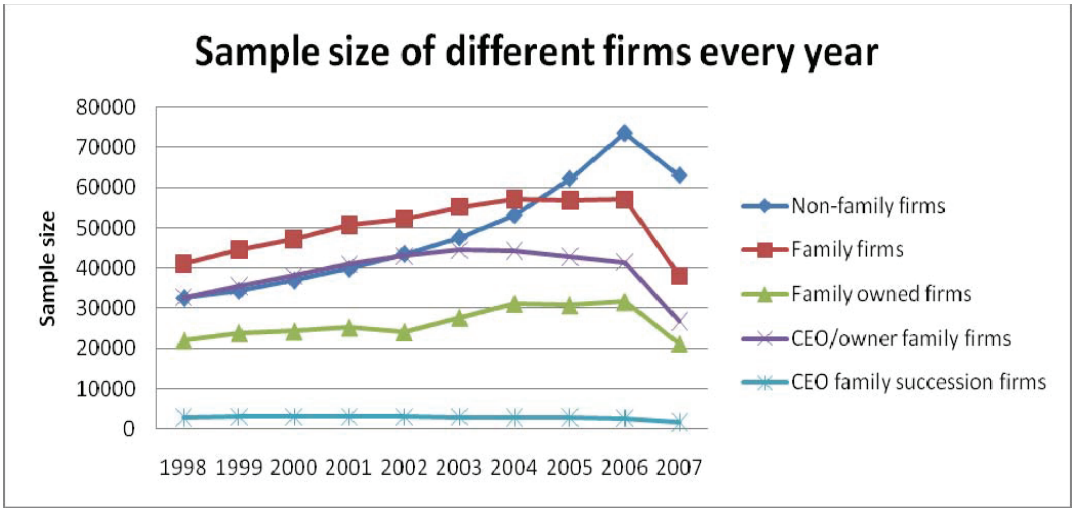

Figure 3.1 Sample size of different firms every year

Notes: 1. Family firms are the sum of all the three subgroups: family-owned firms, CEO/owner family firms, and CEO family succession firms. Every family firm is only considered once, even if it fulfills the criteria of more than one subgroup of family firms; that is, we erased overlapping family firms. 2. Non-family firms are all remaining registered Danish firms that do not fulfill our criteria of family firms. 3. Family-owned firms are defined as firms in which one or several members from the same family together hold more than 10 percent of outstanding shares. 4. CEO/owner family firms are defined as firms in which the CEO is simultaneously a significant shareholder with an outstanding ownership stake of at least 5 percent. 5. CEO family succession firms are defined as firms that have experienced at least one CEO succession within the family during 1993–2005.

Table 3.1 Descriptive Statistics

	Non-family firms	Family firms	Family owned firms	CEO/owner family firms	CEO family succession firms
No. of firms	122365	73107	29984[14]	58044	3628
No. of firms (with info. of legal form)	121761	72696	29866	57672	3603
No. of firms (with info. of firm age)	24706[15]	28553	8253	24643	2379
A/S proportion (%)	38.38	27.38	21.7	28.54	32.8
ApS proportion (%)	50.12	71.9	77.07	71.34	66.89
Other legal forms proportion (%)	11.5	0.72	1.23	0.12	0.31
Average age	25.23	21.95	21.56	22.03	23.45
Median age	18	18	18	18	20
Average size (mil. DKK)	357.92	10.72	9.74	10.49	9.71
Median size (mil. DKK)	3.45	2.73	2.47	2.84	3.12
Average leverage (over the years)	0.54	0.51	0.51	0.51	0.52
Median leverage (over the years)	0.6	0.54	0.53	0.54	0.55

[14] There is overlapping across the three different types of family firms.

[15] We have used the year of incorporation in order to calculate the firm age for each year in our panel dataset. Unfortunately, we do not have information on the year of incorporation for all sample firms. This is the reason for the large decrease in the number of firms with available information about firm age as reported in our descriptive statistics.

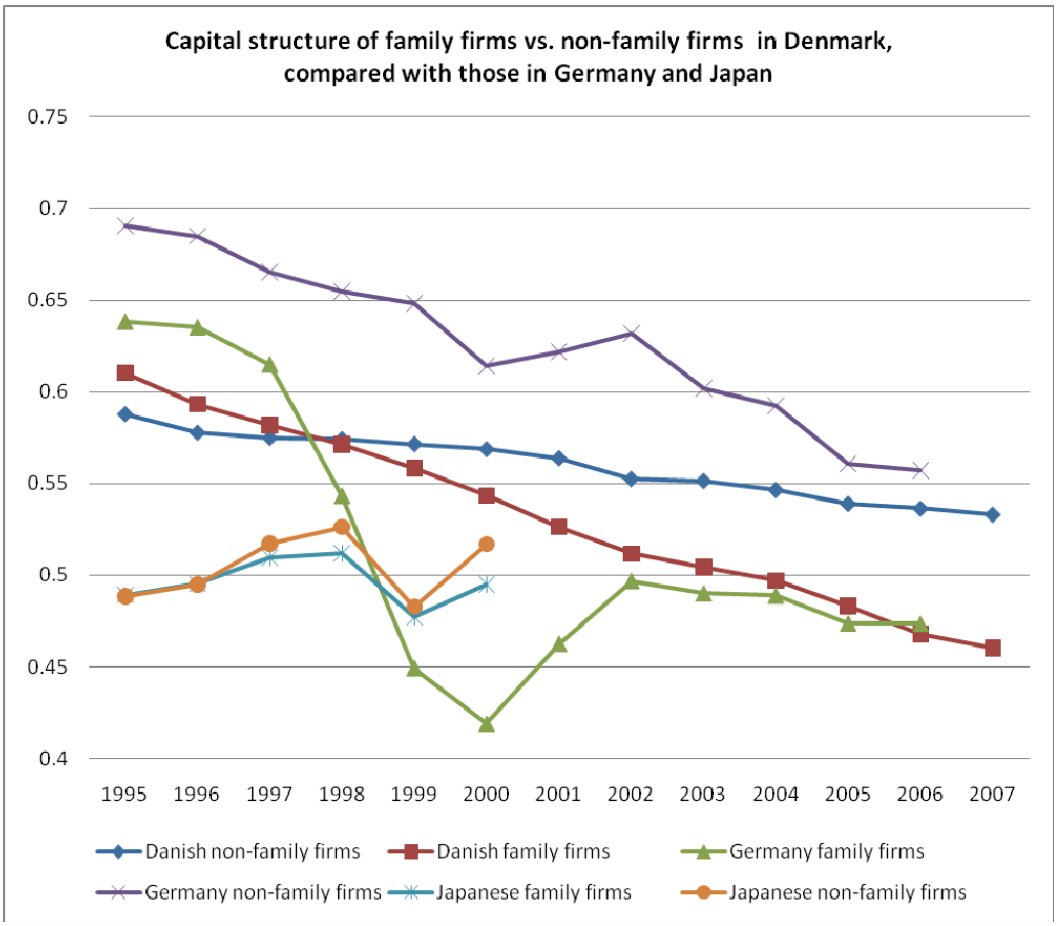

Figure 3.2 The capital structure of family firms vs. non-family firms in Denmark, compared with those in Germany and Japan

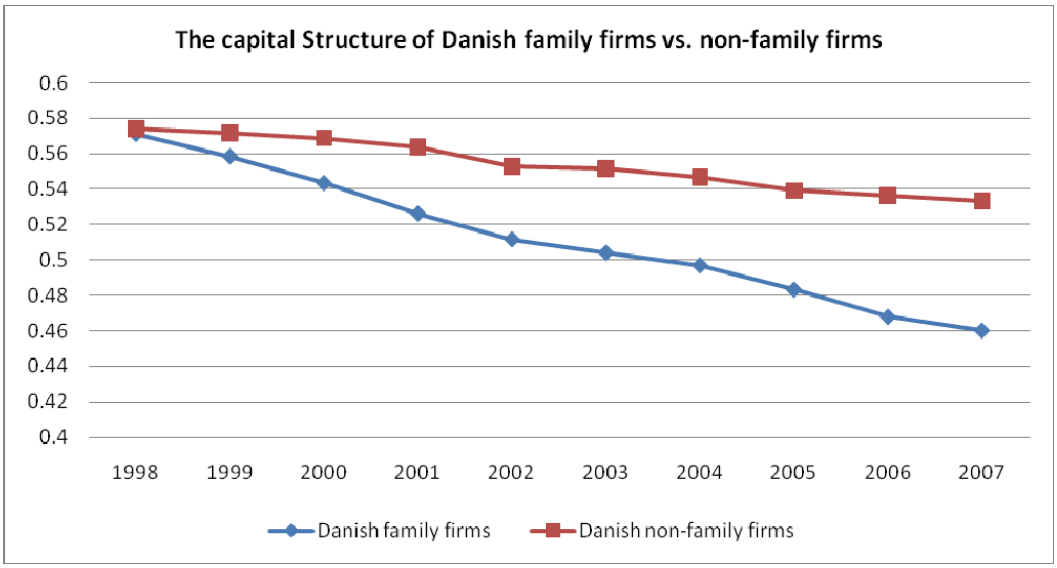

Figure 3.3 The capital structure of Danish family firms vs. non-family firms

Notes: 1. The vertical axis is average book leverage, calculated by book debt/total asset. 2. Family firms are the sum of all the three subgroups: family-owned firms, CEO/owner family firms, and CEO family succession firms, erasing overlapping firms. 3. Non-family firms are all remaining registered Danish firms that do not fulfill our criteria of family firms. 4. Sample size of family firms is 73,107, and the universe of firms has around 200,000 firms.

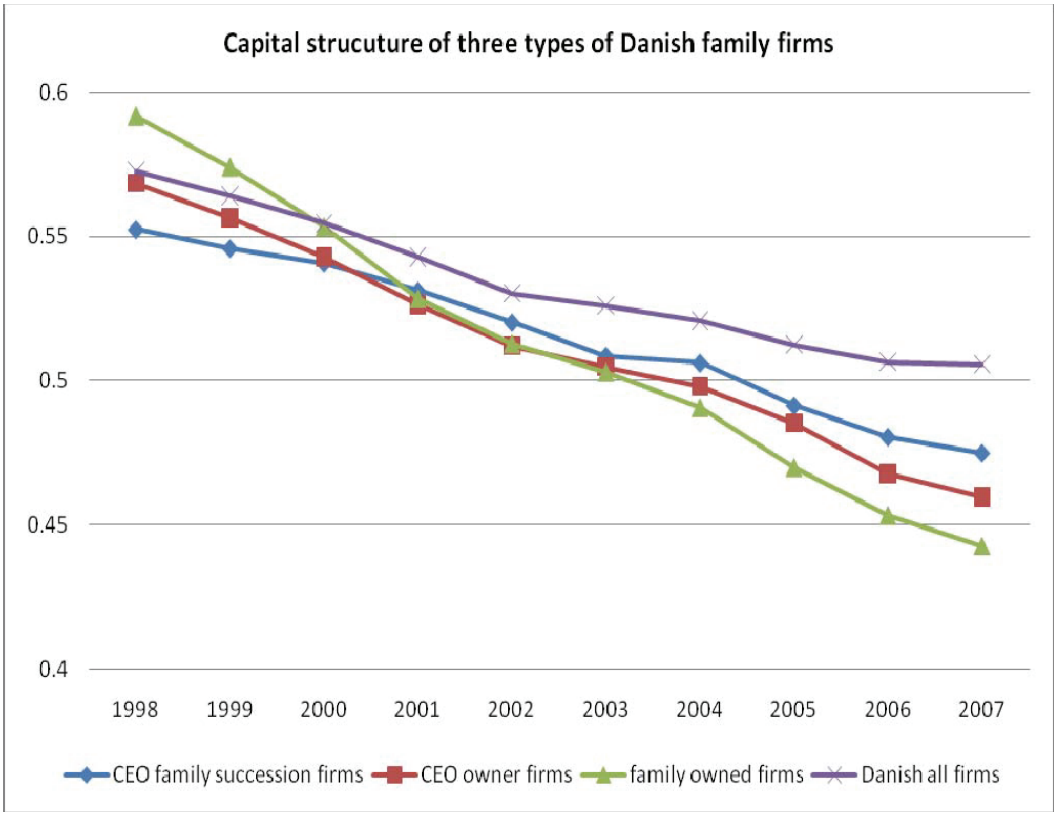

Figure 3.4 The capital structure of three type of Danish family firms

Notes: 1. The vertical axis is average book leverage, calculated by book debt/total assets. 2 Family-owned firms are defined as firms in which one or several members from the same family together hold more than 10 percent of outstanding shares (the sample size of family owned firms is 29,984). 3. CEO/owner family firms are defined as firms in which the CEO is simultaneously a significant shareholder with an outstanding ownership stake of at least 5 percent (the sample size of CEO/owner firms is 58,044). 4. CEO family succession firms are defined as firms that have experienced at least one CEO succession within the family during 1993–2005 (the sample size of CEO family succession firms is 3,628).

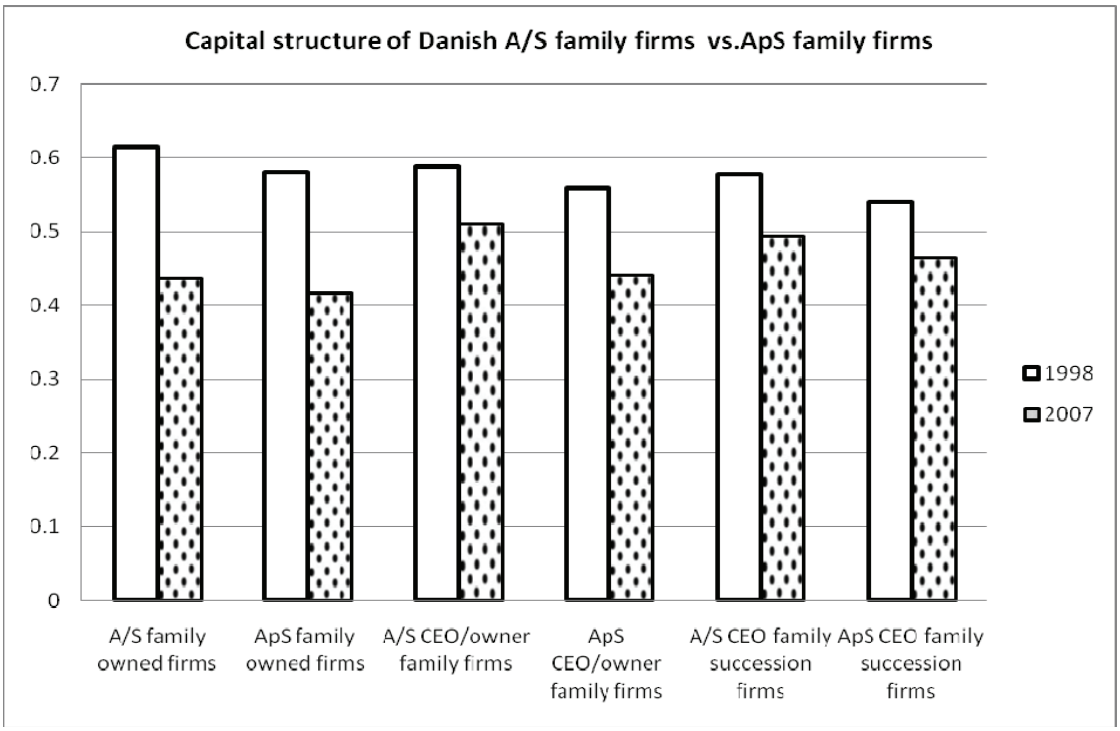

Figure 3.5 The capital structure of Danish A/S family firms vs. ApS family firms

Notes: 1. The vertical axis is average book leverage, calculated by book debt/total assets. 2. A/S (ApS) family-owned firms are defined as those Danish A/S (ApS) firms in which one or several members from the same family together hold more than 10 percent of outstanding shares (sample size 29,866). 3. A/S (ApS) CEO/owner family firms are defined as those Danish A/S (ApS) firms in which the CEO is simultaneously a significant shareholder with an outstanding ownership stake of at least 5 percent (sample size 57,672). 4. A/S (ApS) CEO family succession firms are defined as firms that have experienced at least one CEO succession within the family during 1993–2005 (sample size 3,603).

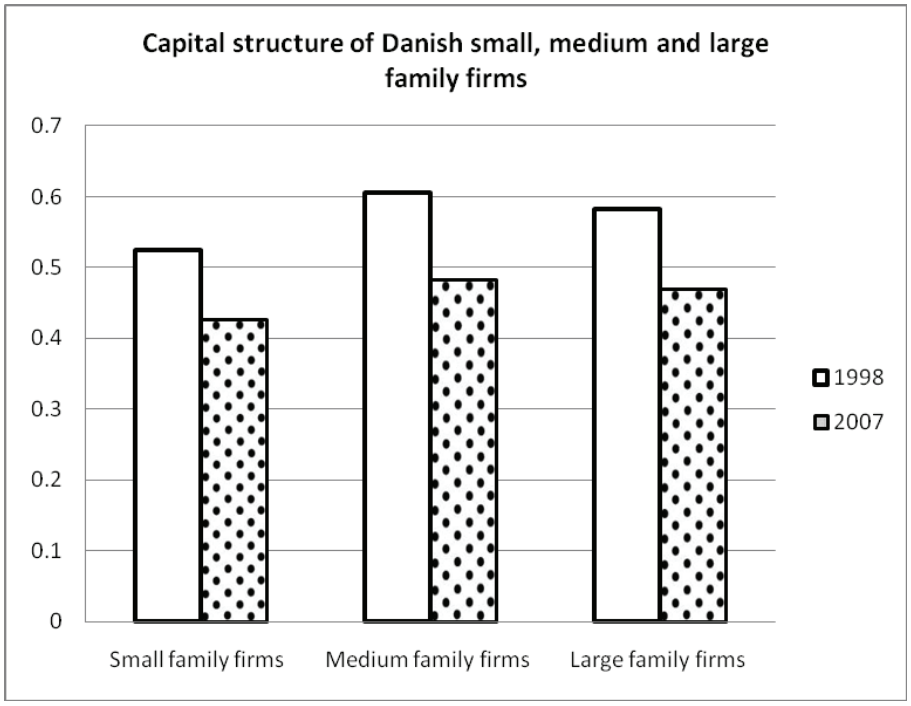

Figure 3.6 The capital structure of small, medium and large family firms

Notes: 1. The vertical axis is average book leverage, calculated by book debt/total assets. 2. Family firms are the sum of all the three subgroups: family-owned firms, CEO/owner family firms, and CEO family succession firms, erasing overlapping firms. 3. Small family firms are those firms whose size is smaller than or equal to the 33.3rd percentile of the size distribution of all the Danish family firms. 4. Medium family firms are those firms whose size is greater than the 33.3rd percentile and smaller than or equal to the 66.7th percentile of the size distribution of all the Danish family firms. 5. Large family firms are those firms whose size is greater than the 66.7th percentile of the size distribution of all the Danish family firms.

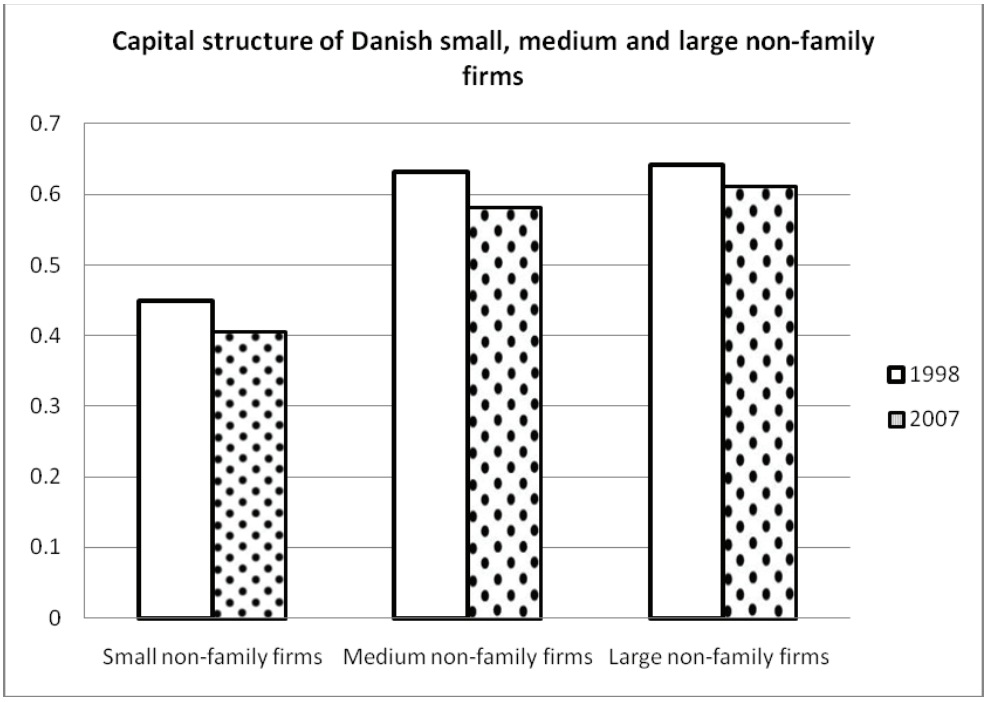

Figure 3.7 The capital structure of small, medium and large non-family firms

Notes: 1. The vertical axis is average book leverage, calculated by book debt/total assets. 2. Non-family firms are all remaining registered Danish firms that do not fulfill our criteria of family firms. 3. Small family firms are smaller than or equal to the 33.3rd percentile of the size distribution of all the Danish non-family firms; 4. Medium family firms are greater than the 33.3rd percentile and smaller than or equal to the 66.7th percentile of the size distribution of all the Danish non-family firms. 5. Large family firms are greater than the 66.7th percentile of the size distribution of all the Danish non-family firms.

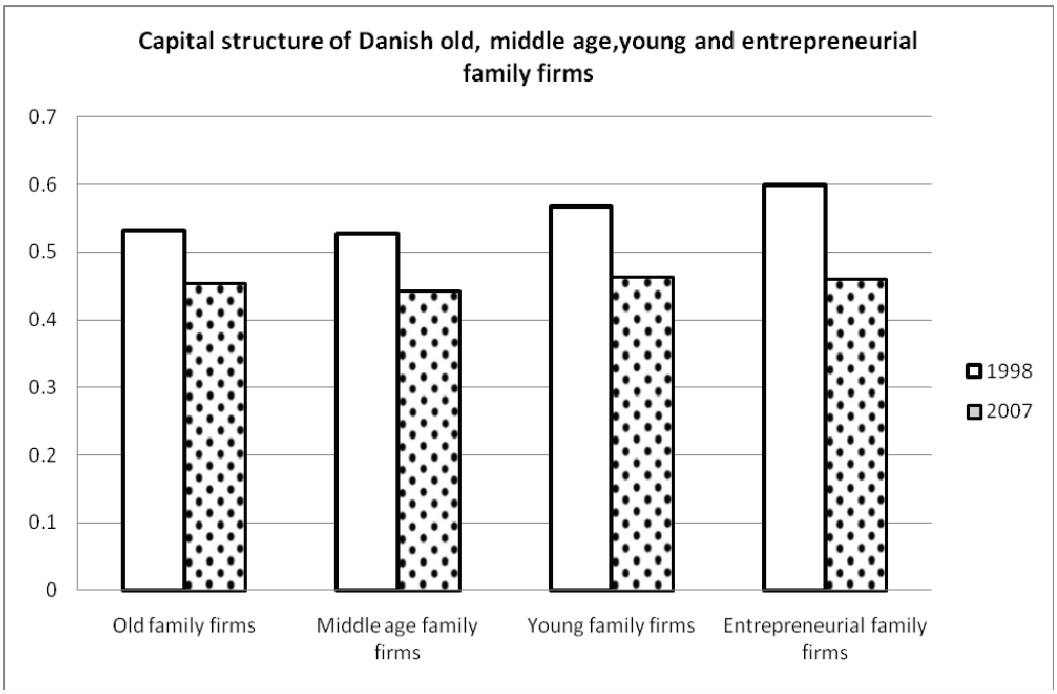

Figure 3.8 The capital structure of old, middle-age, young, and entrepreneurial family firms

Notes: 1. The vertical axis is average book leverage, calculated by book debt/total assets. 2. Family firms are the sum of all the three subgroups: family-owned firms, CEO/owner family firms, and CEO family succession firms, erasing overlapping firms. 3. Old family firms are those established before 1945. 4. Middle-aged family firms are those established between 1945 and 1980. 5. Young family firms are those established after 1980. 6. Entrepreneurial family firms are those established after 1990.

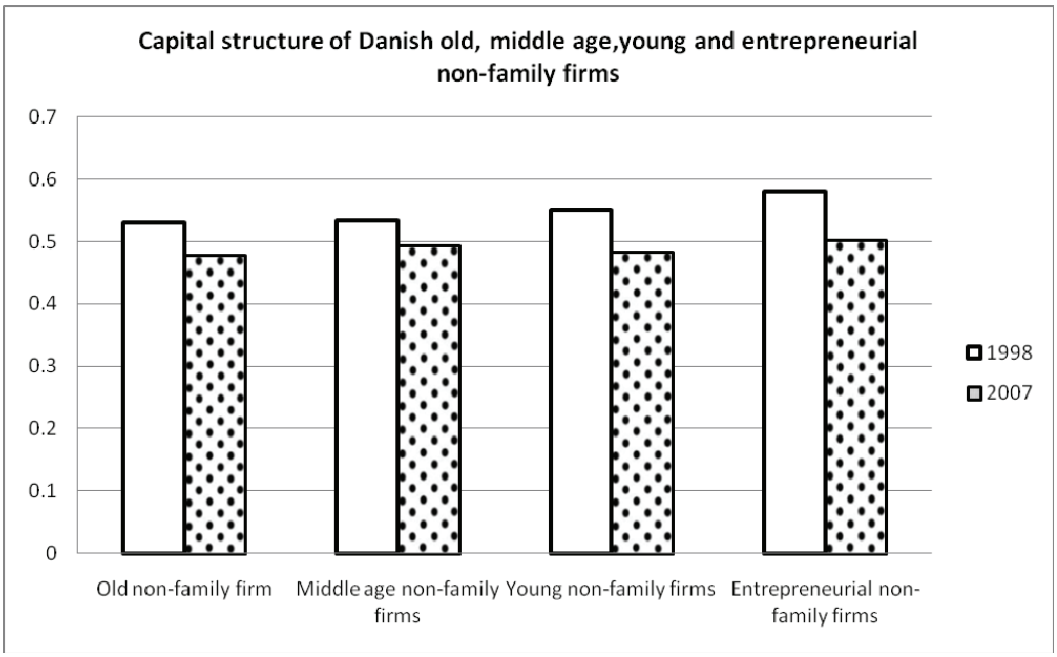

Figure 3.9 The capital structure of old, middle-age, young, and entrepreneurial non-family firms

Notes: 1. The vertical axis is average book leverage, calculated by book debt/total assets. 2. Non-family firms are all remaining registered Danish firms that do not fulfill our criteria of family firms. 3. Old non-family firms are those established before 1945. 4. Middle-aged non-family firms are those established between 1945 and 1980. 5. Young non-family firms are those established after 1980. 6. Entrepreneurial non-family firms are those established after 1990.

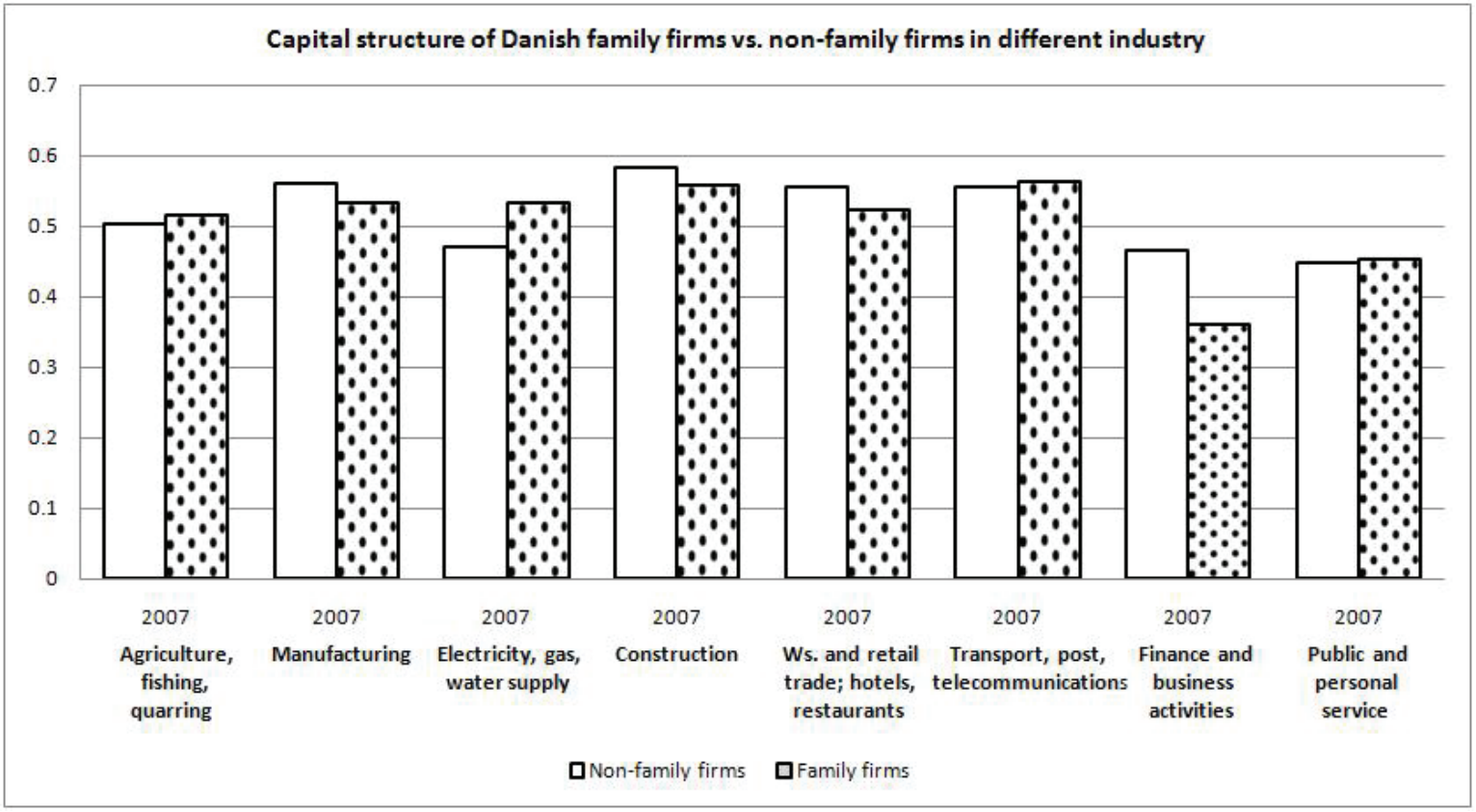

Figure 3.10 The capital structure of Danish family firms vs. non-family firms in different industries.

Notes: 1. The vertical axis is average book leverage, calculated by book debt/total asset. 2. Family firms are the sum of all the three subgroups: family-owned firms, CEO/owner family firms, and CEO family succession firms, erasing overlapping firms. 3. Non-family firms are all remaining registered Danish firms that do not fulfill our criteria of family firms. 4. The industries are classified according to Danish Industrial Classification 2003, which is based on *Nomenclature generale des Activitiés économique dans les Communautes Européennes*, prepared by the EU in 1970.

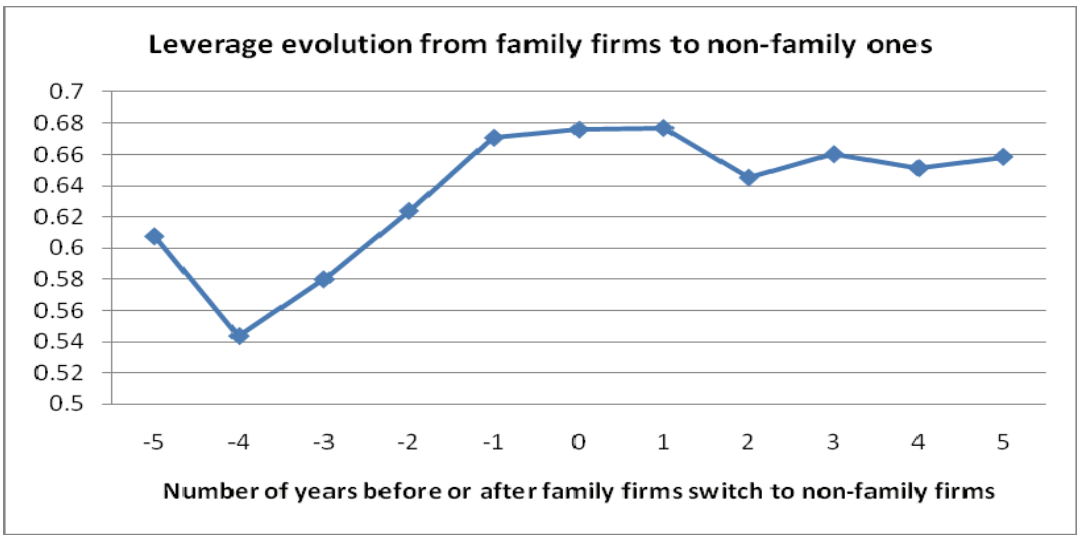

Figure 3.11 Leverage evolution from family firms to non-family firms

Notes: 1. The vertical axis is average book leverage, calculated by book debt/total assets. 2. We located 62 single-owner family firms (subgroup of CEO/owner family firms) that experienced an ownership transition whereby the family owner sold 100% share to one outside investor rather than kept family control, and family succession did not occur thereafter. Thus we believe the new owner firm is no longer a family firm.

Are Family Firms Better Performers During the Financial Crisis?

Haoyong Zhou*

July 18, 2012

Abstract

This paper examines whether family firms are better performers during the global financial crisis. Using a dataset covering firms from S&P 500 (US), FTSE100 (UK), DAX 30 (Germany), CAC 40 (France), and FTSE MIB 40 (Italy) during the period of 2006-2010, I find that broadly defined family firms do not outperform non-family firms during the crisis. However, family firms with founder presence (as CEO, a board member or a significant blockholder) outperform non-family firms by 18 percent in Operating Return on Assets (OROA). Tobin's Q and risk-adjusted Alpha of founder firms, by contrast, do not exhibit any difference. I interpret the attenuation of the market value premium of founder firms as the result of high volatility of stock prices and investors' overreaction during the crisis (Veronesi, 1999; Glode *et al.*, 2010). Further research shows that during the global financial crisis, founder firms invest less and enjoy better access to the credit market than non-family firms. My analysis suggests that the superior performance of founder firms is largely caused by less incentive to invest in risky projects with a high likelihood of failure in order to boost earnings during the crisis. Furthermore, my results reveal that founder firms bear the least agency costs, and that Tobin's Q and Alpha may not be the most appropriate measures of corporate performance during the financial crisis.

***JEL classifications*:** G01; G14; G32

***Key words*:** family firms, performance, founder, corporate governance, financial crisis

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*PhD candidate, Department of Economics, Copenhagen Business School. Address: Porcelænshaven 16 A, 2000 Frederiksberg, Denmark. E-mail: hz.eco@cbs.dk

Introduction

Family firms constitute a large proportion of national economies around the world. This is undeniable (for instance: La Porta, Lopez-de-Silanes and Shleifer for overall outlook, 1999; Anderson and Reeb in the US, 2003; Klein in Germany, 2000; Morck and Yeung in Sweden, 2003; Bennedsen *et al.* in Denmark, 2007; Claessens *et al.* in Eastern Asia, 2000). The prevalence of family firms gives rise to the question of whether or not the family firm is a more efficient organizational form. Earlier empirical studies offer contradictory conclusions. In the US, Holderness and Sheehan (1988) find that family firms have a lower Tobin's Q than non-family firms, while Anderson and Reeb (2003) report opposite findings. Empirical evidence in other countries is mixed and inconclusive (McConaughy et. *al.*, 1998; Morck *et al.*, 2000; Claessens *et al.*, 2002; Cronqvist and Nilsson, 2003).

More recent studies tend to render the conclusion that the outperformance of family firms is sensitive to the definition of family firms (for instance, Maury, 2006; Miller *et al.*, 2007), and that the founders of family firms play a central role in differentiating family firms from their counterparts in corporate performance. Active involvement of founders in top management (CEO) and monitoring as directors of the board is associated with superior corporate performance (Villalonga and Amit, 2006; Miller *et al.*, 2007).

Almost all of the existing literature, however, only focuses on corporate performance comparison between family firms and non-family firms in normal economic times or good market conditions. Studies are rather scant for periods of depression or recession. It is important to re-examine the performance of family firms and non-family firms during recession times because conventional economic rules may not be applicable during recession times. For instance,

Kuppuswamy and Villalonga (2012) report that corporate diversification is valuable to firms during a financial crisis (2007-2009), thus challenging the view of diversification discount since the late 1990s and the early 2000s. Ampenberger et al. (2008) show that family firms are less diversified in unrelated business segments. Therefore, widely-documented outperformance of family firms (especially founder-run firms) during normal times may have been diluted through the channel of less diversification by family firms in the context of a financial crisis. Secondly, in bad times, demand falls from customers and credit constraints increase from financial institutions, especially for those firms which largely rely on debt financing; this may amplify intrinsic organizational fragility which will be reflected in corporate performance. Lins, Volpin and Wagner (2011) argue that the relationship between blockholder control and firm value is more pronounced in the financial crisis because of the adjustment to firm value made by the changing benefits and costs of blockholding[1] during the crisis. Thirdly, Meyer (2011) reports that Private Equity (PE) fund-held firms have incurred less losses relative to non-PE-held firms during the current financial crisis. Similar to PE-held firms, family firms share the characteristics of ownership concentration and intensive board monitoring. It might be interesting to examine whether family firms, like PE-held firms, will experience less performance decline during the crisis.

The global financial crisis was heralded by the Lehman Brother's bankruptcy in 2008. This offers us an ideal setting for studying corporate performance of family firms versus non-family

[1] On one hand, Blockholders are argued to get better access to internal and external financing (e.g. Wruck (1989), Hertzel and Smith (1993), Berglöf and Perotti (1994), Winton (1993), Stein (1997)), help in product markets (Khanna and Palepu (2000)), and offer monitoring (e.g. Shleifer and Vishny (1986), Admati, Pfleiderer and Zechner (1994), Burkart, Gromb and Panunzi (1997), Maug (1998), and Kahn and Winton (1998). These benefits may become more significant during the financial crisis. On the other hand, controlling blockholders also face a tradeoff between using firm funds to extract private benefits and using firm funds to make productive investment. In the financial crisis, controlling blockholders' asset expropriation at the cost of minority shareholders may become more serious (e.g. Zingales (1994), and Shleifer and Vishny (1997)), given that they think private benefits are more attractive.

firms because, as Campello, Graham, and Harvey (2010) state, this crisis, differing from previous ones, originates from the subprime mortgage crisis (customer finance), which spilled over to the corporate domain, and can be viewed as an exogenous shock[2]. Besides this, the large magnitude and global scale of the crisis enable us to conduct an international study rather than a regionally based research, such as the studies conducted on the Asian financial crisis in 1997 (Mitton, 2002; Lemmon and Lins, 2003).

Using a detailed dataset from proxy filings of firms from S&P 500 (US), FTSE100 (UK), DAX 30 (Germany), CAC 40 (France), and FTSE MIB 40 (Italy) during the period of 2006-2010, I aim to contribute to the existing literature by bringing new evidence from the current global financial crisis to bear on the debate whether family firms are an effective organizational form[3].

The second contribution of this paper is to enrich our understanding of the real effects of the financial crisis on firms. A growing body of literature reports some significant decreases in investment during the crisis (for instance, Campello, Giambona, Graham, and Harvey, 2010; Duchin, Ozbas, and Sensoy, 2010; Ivashina and Scharfstein, 2010). However, all of these studies hardly investigate how the impacts of the crisis on corporate performance[4] and investment differ between family and non-family firms. The results of my paper complement these studies and may be of interest to fund managers in portfolio firm screening during recession times.

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[2] Bezemer (2009) argues that the current financial crisis is predictable and that "accounting (or flow-of-fund) macroeconomic models" can help to anticipate the crisis. He lists 12 economists who warn of unsustainable housing debt and the coming of a credit crisis. However, all of these economists only sound the alarm on the mortgage market and housing bubbles. They hardly foresee the spillover of the mortgage crisis into the corporate domain. Therefore, it appears untrue to regard the current crisis as endogenous.

[3] Alchian (1950), Demsetz (1983) and Demsetz and Lehn (1985) launch the question of why family ownership is not dominating if it is indeed a better organizational form.

[4] Lins, Volpin, and Wagner (2011) make an international study (excluding US firms) into the relationship between bolckholder and firm value during the global financial crisis. Although they only focus on firms with family ownership concentration and bypass other family firms like founder-run firms or heir-run firms. My paper complements their research by offering a broader analysis on the different types of family firms. US S&P 500 firms constitute the major body of the sample and I find results that are different from their findings.

In this paper, I pose two research questions. The primary question is: Do family firms outperform non-family firms during the global financial crisis? I find that whether I use the market performance measure (Tobin's Q and Alpha) or the accounting performance measure (Operating Return on Assets (OROA)), broadly defined family firms, comprising 35 percent of the sample, have not significantly outperformed non-family firms during the crisis. However, family firms with active founder involvement (as the CEO, a board member or a significant blockholder) show significantly higher accounting performance by 18 percent relative to non-family firms during the crisis. The Tobin's Q and risk-adjusted return Alpha of founder firms, by contrast, do not exhibit the same significant difference.

Next, I explore the reasons for different findings of founder firms in accounting performance and market performance. On one hand, OROA computes yearly earnings over the book value of the total assets of a firm, which is less likely to be affected by spot stock prices. My results show that during the crisis, compared with non-family firms, founder firms invest significantly less and have better access to the credit market. Croci, Doukas and Gonenc (2011) find that family firms invest less in risky projects and credit markets are more prone to supply family firms with long-term debt). Unlike non-family firms, whose managers are arguably myopic and have more incentive to over-invest in risky projects to boost current earnings (Andersen and Reeb, 2003) under the pressure of managerial dismissal in harsh economic conditions, founder firms are more long-term oriented and take a more conservative investment strategy during the crisis. Risky projects, especially those financed by short-term debt, are most likely to fail with financial constraints. As a result, over-investment with insufficient financing resources lead to project failure and further underperformance because of a dry-out of bank loans during the crisis.

On the other hand, market performance is measured as Tobin's Q and Alpha, which are mainly driven by the market price of stocks. High volatility of stock prices features as one characteristic of recession times (Veronesi, 1999). In addition, investors are apt to be irrational and to overreact to bad market conditions during recession times (Glode *et al.*, 2010). Consequently, high volatility and investors' overreaction may attenuate the value premium of founder firms.

My empirical evidence suggest that founder firms bear the least agency costs compared with other firms during the financial crisis. My results also suggest that during the crisis, when inventors tend to be irrational and stock price volatility is high, Tobin's Q and Alpha may not be the most appropriate measures of corporate performance.

The remainder of my paper is structured as follows: Section 2 presents a review of related literature. In Section 3, I describe data and variables. In Section 4, I show my empirical findings with discussionsand explanations in Section 5. In Section 6, I discuss my findings. Finally, I conclude in Section 7.

2. Family firms, founder value and the financial crisis

Family firms have been receiving more attention from academia, policy makers and practitioners for at least two reasons: First, family firms prevail in national economies around the world. In the US, for example, family firms comprise one-third of the S&P 500 and account for 18 percent of the outstanding shares of the capital market (Anderson and Reeb, 2003). Second, family firms, with ownership concentration in most cases, are a good subject for testing finance theories like agency theory (Berle and Mean, 1932; Jensen and Meckling, 1976). The

key question of family firm research is whether family firms are an effective organizational structure to deliver superior performance relative to non-family firms, and which characteristics of family firms determine that performance. Earlier literature has mixed and inconclusive results regarding this question (Holderness and Sheehan, 1988; McConaughy *et al.*,1998; Morck *et al.*, 2000; Claessens *et al.*, 2002; Cronqvist and Nilsson, 2003; Anderson and Reeb, 2003).

Current literature in family business turns to more fine-grained classifications of family firms to reconcile the conflicting evidences, and it tends to agree that performance examination is sensitive to different definitions of family firms (Maury, 2006). Family firms with active founder involvement as the CEO or a board member predict outperformance. Villalonga and Amit (2006) show that family ownership can gain value only when the founder acts as the CEO of the family business or as the Chairman of the board. Similarly, Miller *et al.* (2007) make a distinction between lone founder businesses where family members of the founder do not involve themselves in management or ownership, and true family businesses where family members do. The results show that only businesses with a lone founder outperform. By the same token, Adams *et al.* (2009) identify a positive causal effect of founder–CEOs on firm performance, and report that founder–CEOs are more likely to step down from the CEO position after periods of either unusually low or unusually high operating performances. These research studies suggest a positive view of founder value and the necessity of a more fine-grained family firm classification when conducting family business research.

Although a host of literature centers on the performance examination of family firms vis-à-vis non-family firms in normal economic times or good market conditions, studies are almost missing on what their performance will be like during times of depression or recession. The global financial crisis since 2008 gives us an opportunity to address this problem. The extreme

market condition (both financial market and product market) during the crisis is more likely to amplify various factors that drive the performance of family business, making it unclear whether family firms can better handle an exogenous financial crisis on the balance of costs and benefits of family ownership, management and control.

On one hand, asset expropriation of minority shareholders by powerful controlling family shareholders might be more severe during the crisis, implying that family firms might under-perform. Unlike small diversified shareholders, who use market value rules to decide investments that maximize the value of the firms, large family shareholders, may derive greater private benefits from pursuing different investments, excessive compensations, and special dividends given their slumping capital incomes during the crisis (Fama and Jensen, 1985; Andersen and Reeb, 2003). Baek *et al.* (2003) document that chaebol firms with concentrated shareholding by controlling families had a larger drop in their equity values during the Korean financial crisis (1997). Firms with disproportionate ownership structure (voting rights exceed cash flow rights) also experience lower returns. Lins, Volpin and Wagner (2011) use a non-US dataset consisting of more than 8000 firms from 40 countries to find that family control is associated with lower firm valuation globally following a financial shock. In addition, family entrenchment and nepotism during the crisis may also hit firm values. Shleifer and Vishny (1997) suggest that one big cost of concentrated family ownership is from the remaining unqualified family members who may run the firm. Perez-Gonzalez (2006) and Bennedsen *et al.* (2007) evidence the performance drop of family succession, suggesting a high cost of nepotism and unqualified family CEOs. During the crisis, when market conditions are harsh, unqualified management may bring more costs to family firms. Using a sample of 800 firms in eight East Asian countries during the Eastern Asian financial crisis, Lemmon and Lins (2003) show a

significantly lower value of firms with entrenchment managers by 10-20 percent relative to other firms[5].

On the other hand, however, superior performance of family firms might arise from the better alignment of interests between shareholders and managers in family firms (Andersen and Reeb, 2003). Interest conflict between long-term oriented owners and short-term oriented managers is highly costly when a crisis comes. For example, it is well known that managers have the incentive to take excessively risky projects when a firm is close to bankruptcy, because they get the upside gain of the excess risk, but lose nothing from the downside failure. During the crisis, this situation is highly likely to happen. Moreover, myopic managers may over-invest in projects to boost current performance given falling sales during the crisis. Overinvestment is highly risky when financial instruments of the firms are not rich. A dry-out of short-term loans from banks with increasingly stringent lending policy might plague ongoing projects. Family firms with large shareholders as managers do not have such a problem. Villalonga and Amit (2006) document that founder-CEO firms, free from owner-manager conflict of interests, have the highest Tobin's Q among all of the different types of family firms they have categorized. Another source of outperformance during the crisis might relate to the reputational concerns of family owners with a long-term commitment to family firms. Chen *et al.* (2010) find that family firms are less tax aggressive than their non-family counterparts. They interpret the findings as the family owners' willingness to forgo tax benefits to avoid the potential penalty and reputational damage from an Internal Revenue Service audit. They also find that firms in need of external capital would exhibit even lower tax aggressiveness. Andersen and Reeb (2003) argue that banks

[5] Asian firms are known for a bad corporate governance with a weak legal protection of their investors. Although Baek et al. (2003) and Lemmon and Lins (2003) give evidences of family ownership underperformance in Asian countries during the regional financial crisis in 1997, it is doubtable whether these results can apply to firms in Western countries with a better corporate governance and institutional environment.

or other financial institutions are more likely to deal with the same governing entities and practices like those in family firms with reputational concerns than in non-family firms. Croci, Doukas and Gonenc (2011) evidence that credit markets are more prone to supply family firms with long-term debt. During the crisis, when most firms encounter credit constraints, the established relationship with financial institutions could enhance the operating performance of the firms that do not forgo good investments because of financing problem.

To sum up, whether family firms outperform non-family firms in the financial crisis remains an open empirical question. In the following sections, I will provide empirical evidences to investigate this question.

3. Data and variables

3.1 Sample and sources of data

The sample consists of a panel of 3,286 firm-year observations, representing 658 firms from S&P 500 (US), FTSE100 (UK), DAX 30 (Germany), CAC 40 (France) and FTSE MIB 40 (Italy) with accounting data from 2006 to 2010. These firms play a vital role in the Western industrialized economies. The primary industries of the sample firms span 61 different two-digit SIC codes. Noticing the turnover of the index firms each year during the period of 2006-2010, I only include those index firms in the 2011 lists, even though some of them may not stand in the index lists in a particular year[6].

[6] I will discuss the problem of survival bias in Section 4.6.

My data collection process comprises three main phases. In the first phase, I compile a dataset to identify blockholders (big shareholders with at least 5 percent of the outstanding shares), board members and top management for each sample firm. I later use the dataset to define family firms. Bureau van Dijk Orbis was the source of the ownership and board data, which covers as many as 78.4 million private and public firms (in 2011) from all over the world. It provided a historical ownership structure alongside information on the board members and top managers of each of the sample firms.

In the second phase, I manually collect information on the founding history of each firm from the following sources: (1) company official website; (2) Hoover's; and (3) web searches on the firm's history and family running history. I use the collected information to identify the founders, founding families and family member relationships to further define the family firms.

The last phase is to merge the information from the first two phases with accounting data from COMPUSTAT and other firm characteristic data (firm age data was from Bureau van Dijk Orbis, and market value as well as stock return data were from Datastream and CRSP). Table 1 describes the definitions of all of the variables in my research.

[Inset Table 1 here]

3.2 Definitions of the different types of family firms

A key challenge for any analysis regarding family firms is the lack of a widely accepted definition[7] of what a family firm is (Bennedsen *et al.*, 2010). Previous work has shown that the results of empirical studies are highly sensitive to the choice of the family firm definition (Maury, 2006; Miller *et al.*, 2007). Taking this into account, I manage to incorporate a broad definition of

[7] Miller *et al.* (2007) give a comprehensive review of various definitions of family firms.

family firms into my research, and then scrutinize the possible difference across various types of family firms with my findings. Specifically, my approach of definition covers the following 4 types of family firms:

1. Founder firms, defined as firms in which the founder/founders of the firms holds/hold a position/positions as a board member, CEO, or a blockholder (has at least a 5 percent share holding).
2. Heir firms, defined as firms in which the heir/heirs (by blood or by marriage) of the founding family holds/hold a position/positions either as a board member, CEO, or a blockholder (has at least a 5 percent share holding).
3. Family-owned firms, defined as firms in which one individual or several members from the same family hold more than 10 percent of the outstanding shares, either directly or indirectly, through another family firm or fund which the individual or the family controls or owns.
4. Leader/owner firms, defined as firms in which the CEO or a board member is simultaneously a significant shareholder with an outstanding ownership stake of at least 5 percent.

When identifying founder(s) and heir(s) of a firm, following Villalonga and Amit (2006), I search from at least two sources of public information. The founder(s) may have founded either one sample firm or a predecessor firm of a sample firm. I regard founder(s) as the people responsible for the firm's early growth and development. Therefore, large owners taking control of a firm through a spin-off or a leveraged buyout are not founders in my definition.

When identifying large family firm investors in defining family-owned firms, following Villalonga and Amit (2006), I exclude investment management company investors, such as

Fidelity (founded and controlled by Edward Johnson and his daughter, Abigail), or Franklin Resources (founded and controlled by brothers Charles and Rupert Johnson), whose funds act as large institutional investors in the sample firms. I disregard these funds as large family firm investors because the ultimate owners of these funds are a widely dispersed base of diversified investors, not the investment management companies *per se*.

3.3 Measure of firm performance

Following earlier studies, I mean to investigate both market performance and accounting performance of family versus non-family firms during the financial crisis. I use Tobin's Q as the chief market performance measure[8] and interpret it as a measure of firm value. In my setting, Tobin's Q is calculated as the market value of the equity at the end of the fiscal year plus the book value of the total liability (the book value of the total assets – the book value of the equity) divided by the book value of the total assets at the end of the fiscal year. The market value of the equity is from Datastream, and the book values of the total assets and the equity are from COMPUSTAT. I use Operating Return on Assets (OROA) as an accounting performance measure. It is Earnings before Interests and Taxes (EBIT) divided by the book values of the total assets. Both EBIT and the book value of the total assets are from COMPUSTAT. OROA is a natural measure of firm performance because it acts as a comprehensive proxy for a firm's cash flow before interest and taxes relative to its book asset, the earning generator (Bennedsen *et al.*, 2007). Unlike a net income-based measure like Return on Assets (ROA), it is unaffected by the variation of capital structure, which determines a corporate tax base. Unlike return on equity (ROE), it captures the total assets rather than part of it.

[8] As an alternative measure of market performance, I also use Alpha from Fama and the French Three Factor Model to take into account market risks. I discuss this issue in Section 4.5.

3.4 Descriptive statistics

Table 2 shows the two-digit SIC industry distribution of the sample firms. As the main findings of this paper center on family firms and founder firms, I only list family firms (column 4), founder firms (column 5), and non-family firms (column 6) in this table. Although family firms are prevalent in national economy, they are not symmetrically distributed in every industry. Villalonga and Amit (2006) report that family firms are not present in 13 two-digit SIC industries, and that they are over-represented in some industries. In my sample, I find 11 two-digit SIC industries that are free of family firms. My results of industry representation of family firms are comparable to the findings of Villalonga and Amit (2006) as well as Anderson and Reeb (2003). In addition, founder firms are concentrated in industries such as electronic and other electrical equipment (two-digit SIC code: 36), as well as business service (two-digit SIC code: 73). These results imply that controlling for industries matters to an econometric analysis.

[Insert Table 2 here]

Table 3 provides the descriptive statistics of the main variables of the sample firms during the crisis year 2008. All of the ratio variables are winsorized at 1 percentile and 99 percentile. I have concentrated my focus on family firms, founder firms, and non-family firms. Please refer to Appendix 3 for the details of the other subgroups of the family firms.

Family firms constitute 35 percent of the sample, which is highly consistent with the findings of Villalonga and Amit (2006, 37 percent) as well as Andersen and Reeb (2003, 35 percent). On average, family firms and founder firms are significantly smaller and less leveraged at 1 percent level relative to non-family firms. The results are consistent with those of Ampenberger *et al.* (2011) as well as Villalonga and Amit (2006). Less leverage may imply adverse risk characteristics of the family firms. However, family firms and founder firms invest more and

expend more significantly at 1 percent level. More importantly, founder firms exhibit more difference relative to non-family firms in their number of employees, firm age, research expense, as well as depreciation and amortization. These findings suggest that founder firms are younger firms with fewer employees, and that they are concentrated in high tech industries, which require intensive research and development investment. In terms of dependent variables OROA and Tobin's Q, I find that founder firms have significantly higher values compared with non-family firms in Tobin's Q, while they do not in accounting performance OROA. The data thus suggest that at the beginning of the crisis, family firms as a whole do not outperform non-family firms with respect to Tobin's Q and OROA. However, founder firms, a subgroup of family firms, are better performers in market value, but not in operating profitability. Earlier I argue that the financial crisis has had a significant impact on the real economy since 2009. The fiscal year choice (2008) may explain the different performance of the founder firms in OROA and Tobin's Q relative to the non-family firms. Appendix 3 evidences that all of the other non-founder family firms: heir firms, family-owned firms and leader/owner firms do not exhibit performance superiority relative to non-family firms in both OROA and Tobin's Q. These findings are consistent with those of Miller *et al.* (2007), suggesting a founder firms' value premium. In the next section, I will use multiple regressions to analyze the performance difference between family firms and non-family firms in a 5 year panel framework, which spans the period before and during the crisis, controlling for country, industry, and firm specific characteristics.

[Insert Table 3 here]

4. Do family firms outperform non-family firms in the financial crisis?

The principal objective of this paper is to examine whether family firms outperform non-family firms during the global financial crisis, and investigate the reasons for any possible outperformance. In this section, I will use several methods to show the main empirical results and to answer any related questions.

4.1 Univariate difference in difference analysis

I start my analysis with univariate difference in difference test of OROA, and Tobin's Q. Again, I list the 2 performance measures of non-family firms, family firms and founder firms before and during the crisis in Table 4.

[Insert Table 4 here]

My first step focuses on a comparison between all of the family firms and the non-family firms. I find that both the accounting performance and the market performance are not significantly different except for the two-year-mean of Tobin's Q before the crisis (2006-2007). The performance change across the crisis for family firms and non-family firms are similar. These results imply that my broadly defined family firm group does not consist of superior performers during the financial crisis.

Next, I focus on the comparison between the founder firms and the non-family firms. With respect to their accounting performance OROA, the first striking result is that even during the crisis, founder firms' OROA does not drop significantly when compared with their performance before the crisis. To be specific, the three-year-mean of OROA before the crisis is 0.116 versus 0.111 for the two-year-mean during the crisis. By contrast, non-family firms during the crisis have a profitability shrink by 14 percent, while all family firms experience a 12 percent shrink.

Additionally, founder firms significantly outperform non-family firms during the crisis by 16 percent, and the change in performance before and during the crisis is also significantly different at 10 percent level. The findings provide the first evidence of the founder firms' outperformance during the crisis.

The picture of Tobin's Q is somehow different. Although founder firms significantly outperform non-family firms, both before and during the crisis, the magnitude of outperformance decreases when the crisis shocks the firms. Prior to the crisis, founder firms outperform non-family firms by 0.607 in Tobin's Q. During the crisis, however, founder firms only outperform by 0.380, which suggests that the financial crisis reduces the market value premium of the founder firms. I notice that in the case of the accounting performance OROA, the crisis tends to amplify the performance difference between founder firms and non-family firms from 0.005 (before the crisis) to 0.015 (during the crisis). The difference of OROA and Tobin's Q in magnitude change implies that the financial crisis may have a disparate effect on corporate cash flow based performance and market value based performance. I use multivariate regressions to scrutinize the difference in the next sub-section.

4.2 Firm fixed effect estimation

First, I use a firm fixed effect model to test whether family firms outperform non-family firms during the crisis. The econometric model is as follows[9]:

$$Y_{it} = \alpha_0 + \beta_0 Family_i * Crisis_t + \beta_1 Crisis_t + X'_{it-1}\beta_2 + u_i + e_{it} \qquad (1)$$

[9] Following earlier research studies, I define the variables $Family_i$, $Founder_i$ $Heir_i$, $Family\_owned_i$ and $Leader\_owner_i$ as a time invariant variable, indicating persistent family ownership, management and control. Because firm fixed effects absorb all firm level time-invariant effects, I drop the variable $Family_i$ from my fixed effect model. The firm fixed effect specification is also supported by the Hausman test.

Where Y_{it} is performance measure, referring to OROA or Tobin's Q. $Family_i$ is a dummy which equals one if one firm is a family firm. $Crisis_t$ is a dummy, denoting either *Crisis_acc*, which equals one if the fiscal year is 2009 or 2010, or *Crisis_mkt*, which equals one if the fiscal year is 2008, 2009 or 2010. *Crisis_acc* is used with OROA and *Crisis_mkt* is used with Tobin's Q[10]. $Family_i * Crisis_t$ is an interaction variable. β_0 is the coefficient of interest. u_i is the firm fixed effect, and e_{it} is an error term. X'_{it-1} is a vector of the lagged control variables[11]. Following Andersen and Reeb (2003), Villalonga and Amit (2006), as well as Miller *et al.* (2007), I incorporate several control variables into my model: Firm size is the natural logarithm of the book value of the total assets. Growth opportunities and advertising expense[12] are measured as research and development expenses over sales and advertising expense over sales respectively. Return volatility, the proxy for firm risk, is calculated as the standard deviation of the monthly stock returns for the last 36 months. Capital structure is the ratio of debt to total assets. Investment is the capital expenditure over the plant, property and equipment (PPE) at the end of the last fiscal year. I also include the firms' age, and natural logarithm of number of employees.

Table 5 illustrates that after controlling for firm fixed effects and time-variant firm specific characteristics, family firms, as broadly defined in the sample, do not significantly outperform non-family firms during the crisis. The insignificance is similar whether I use OROA or Tobin's Q as a performance measure and is consistent with early univariate analysis.

[Insert Table 5 here]

[10] The financial crisis hits the capital market and real economy at different time. Please refer to Table 1 for clarification.

[11] I use lagged control variables to control for contemporary feedback effects between the dependent variables and the control variables.

[12] Following Millers *et al.*, I code missing data as 0, because public corporations have to report significant expenditures by law.

Next, I split the family firms into 4 subgroups and introduce 4 dummies to the fixed effect model. I aim to examine whether different groups perform differently during the crisis. The model I use is as follows:

$$Y_{it} = \alpha_1 + \beta_0 Crisis_t + \beta_1 Founder_i * Crisis_t + \beta_2 Heir_i * Crisis_t + \beta_3 Family\_owned_i * Crisis_t + \beta_4 Leader\_owner_i * Crisis_t + X'_{it-1}\beta_5 + u_i + e_{it} \quad (2)$$

Where Y_{it} is a performance measure, referring to OROA or Tobin's Q. $Founder_i$ $Heir_i$ $Family\_owned_i$ and $Leader\_owner_i$ are dummies which equal one if one firm is a founder firm, heir firm, family-owned firm and leader/owner firm respectively. $Crisis_t$ is a dummy, denoting either *Crisis_acc*, which equals one if the fiscal year is 2009 or 2010, or *Crisis_mkt*, which equals one if the fiscal year is 2008, 2009 or 2010. $Founder_i * Crisis_t$, $Heir_i * Crisis_t$, $Family\_owned_i * Crisis_t$, and $Leader\_owner_i * Crisis_t$ are interaction variables. β_1 to β_4 are the coefficients of interest. X'_{it-1} is the same vector of the lagged control variables as in model (1). u_i is the firm fixed effect. e_{it} is an error term.

Table 6 exhibits disparate pictures for both the accounting performance OROA and the market performance Tobin's Q. Only founder firms show a significantly superior performance in OROA during the financial crisis, while they do not in Tobin's Q. In the case of OROA, the positive coefficient of *Founder* is significant at 5 percent level. It means on average, that founder firms outperform non-family firms by 2 percent OROA during the crisis. The magnitude of outperformance accounts for as high as 18 percent of the mean OROA of non-family firms in 2009 and 2010. In contrast, when controlling for the firm fixed effects and other time-varying factors, founder firms do not exhibit a significant value premium, measured in Tobin's Q during

the crisis. These results complement the works of Andersen and Reeb (2003), Villalonga and Amit (2006), Maury (2006), as well as Miller *et al.* (2007) by providing new evidence suggesting that in recession times, the market value premium of founder firms disappears, whereas their accounting performance premium persists.

[Insert Table 6 here]

4.3 Endogeneity of founder status and other robustness tests

Although fixed effect estimation controls for unobservable time-invariant heterogeneity, time-variant heterogeneity may bias the estimates. Founder status is not randomly assigned to sample firms. I am unable to identify an unbiased and consistent estimator, given the underlying omitted determinants of selection into founder firms are correlated with outcome performances. I adopt Instrument Variable (IV) 2SLS estimation to tackle this issue.

The first step is to run an OLS regression of the founder status on an instrument variable with various controls used for the second stage regression:

$$Founder_i = \alpha_2 + \beta_0 Old\ firm_i + X_i'\beta_1 + e_i \quad (3)$$

A valid instrument should be strongly correlated with the endogenous dummy Founder, while it is uncorrelated with the error term of the second stage regression. The instrument I use is Old firm, which is one if a firm is incorporated before 1960. Fahlenbrach (2009) first introduces this instrument[13] to analyze a founder-CEO effect on investment and stock market performance. A firm set up before 1960 is most unlikely to have its founder(s) present at the firm given the average age of founder firms is 29 in my sample. When the instrument is strongly correlated with

[13] Fahlenbrach uses 1940 as a threshold of old firms. However, his sample period is from 1995 to 2002. In my case, I use 1960 since my sample period is from 2006 to 2010.

founder firms, it has a slim chance of affecting the operating performance beyond the control variables in the second stage regression.

In the second stage, we use the predicted values of Founder from the first stage regression to replace the dummy Founder and then regress the firm performance on predicted Founder and control variables:

$$Y_{OROA} = \alpha_3 + \beta_2 \hat{Founder}_i + X_i' \beta_3 + e_i \quad (4)$$

Where Y_{OROA} is the difference between the average OROA from the period of 2009-2010 and the average OROA from the period of 2006-2008. $Founder_i$ is a dummy which equal one if one firm is a founder firm, heir firm, family-owned firm and leader/owner firm respectively. β_2 is the coefficient of interest. X_i' is a vector of control variables. The control variables are also the difference between the average of the period of 2009-2010 and the average of the period of 2006-2008. These control variables include firm size, growth opportunities, advertising expense, firm risk, capital structure, firm age, and number of employees. e_i is an error term.

In Table 7, the first-stage regression shows that Founder is strongly negatively related to Old firms (the coefficient is as high as -0141, significant at 1 percent level), implying the legitimacy of the instrument. In the second stage regression, the coefficient of Founder is 0.059, which is significant at a 10 percent level. The finding is consistent with that of the former fixed effect model. Taken together, the results of IV 2SLS estimation confirm the outperformance of founder firms in OROA during the crisis.

[Insert Table 7 here]

As an alternative robustness test[14], I exclude financial firms from the sample and re-run the firm fixed effect regressions. The results are consistent with those of the full sample. The magnitude of the coefficient of interest highly resembles that from the full sample estimation (Please refer to column 1 in Appendix 4 for details).

4. 4 Cross-country tests

In this sub-section, I consider whether country-level characteristics (for example, legal protection of shareholders, corporate governance systems and other institutional environments) add explanatory power to our findings.

I first divide the sample into Anglo-Saxon and Continental European groups by the legal origin (La Porta, Lopez-de-Silanes, Shleifer, and Vishny, 1998) of the stock exchange country of a sample firm (in the sample, US S&P 500 and UK FTSE 100 firms are categorized into the Anglo-Saxon group and the rest of the sample is added to the Continental European group). The results (not reported for brevity) show that a founder premium in OROA is only significant in the Anglo-Saxon group, while Tobin's Q of the founder firms is not significantly different from non-family firms whether I use the Anglo-Saxon or the Continental European sample. The latter is consistent with the case in the full sample.

Next, I split the sample by US and non-US firms and find that the results are highly consistent with those in the first split of the sample above. Only US firms exhibit a founder premium in OROA (refer to column 2 in Appendix 4). Considering that 82 percent of the founder firms are US firms and that the US firms constitute a large body of the sample, I conclude that the US founder firms mainly contribute to the explanatory power of my findings.

[14] I also use pooled OLS to check the outperformance of the founder firms in OROA, using the full sample. The results are highly consistent with those of the fixed effect estimation (for brevity not reported).

4.5 Alternative measure of market performance

I am aware of the inconsistent findings from the regression of Tobin's Q with those from the OROA. Founder firms do not outperform during the crisis in Tobin's Q, but in OROA. Numerous literature reports high volatility (for example, Veronesi, 1999) of stocks during recession times, thus indicating a high risk in financial markets. High market risk during the crisis is likely to affect the volatility and the return of individual stock prices. Therefore, using non-risk-adjusted Tobin's Q as a market performance measure may be problematic.

To exclude common market risks from the individual stock performance, I calculate annualized monthly risk-adjusted performance estimates (Alpha) and use Alphas as an alternative measure of market performance to replace Tobin's Q and re-run the fixed effect regressions. Following Carhart (1997) as well as Gil-Bazo and Ruiz-Verdu (2009)[15], I use a two-stage estimation procedure to obtain a panel of monthly Alphas. In the first stage, for each month, I regress the excess returns of individual stock on the Fama and French (1993) 3 risk factors[16] over the past 5 years to obtain betas. If less than 5 years of previous data is available for a specific stock-month, I required the stock to be present in the sample for at least 48 months in the past 5 years. In the second stage, I estimate a stock's monthly Alpha as the difference between the stock's excess return and the realized risk premium, defined as the vector of betas times the

[15] I focus on US firms because I want to ensure that my estimates of Alphas from the Fama and French three factor model are free from cross country heterogeneity.

[16] The regression equation is: $R_i - r_f = Alpha + \beta_1(R_m - r_f) + \beta_2 SMB + \beta_3 HLM$ where $R_i - r_f$ is the excess return of stock i, r_f is the risk-free return rate, and R_m is the return of the whole stock market. $R_m - r_f$ is the market excess return. *SMB* stands for "small (market capitalization) minus big" and *HML* for "high (book-to-market ratio) minus low"; they measure the historic excess returns of small caps over big caps and of value stocks over growth stocks. These three factors are historical data and available from Kenneth French's homepage: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html.

vector of the three factors. Finally, for each stock, I take an average of 12 monthly Alphas to get annualized monthly Alphas.

Table 9 shows the results of the fixed effect estimation using Model (2) with Alpha as a dependent variable. The findings are highly consistent with those found in the case of Tobin's Q as a market performance measure. Neither broadly-defined family firms nor founder firms outperform relative to non-family firms in Alpha. In Section 5, I will scrutinize the reasons for the attenuation of the market value premium of founder firms during the crisis.

[Insert Table 8 here]

4.6 Do surviving firms bias estimation?

The sample covers firms standing in the list of S&P 500, FTSE 100, DAX 30, CAC 40 and FTSE MIB 40 in 2011. This means that those firms all survived the crisis period of 2006 - 2010. They are presumably superior performers in the market. Turnover of index firms is common. Focusing only on those survivors may bias the estimation.

To address this concern, I restrict the sample to those firms which are consistently present in the S&P 500 index in each year (389 firms) through the period of 2006 - 2010[17] and re-run the regressions using model (2) with Tobin's Q, Alpha and OROA as dependent variables. The results in Appendix 5 are in consistence with those of the full sample.

I summarize this section by stating that when the financial crisis comes, broadly defined family firms are not superior performers. Only founder firms outperform other firms during the crisis in terms of OROA. However, the market value premium of founder firms, which is widely

[17] I only use US firms for this robustness test, because US firms mainly contribute to the explanatory power of the findings.

documented in normal or good economic times in earlier studies, disappears. I will explain these phenomena in the next section.

5. Why do founder firms outperform in operating profitability, but not in market valuation?

I start to explain the different performance of founder firms with respect to OROA and Tobin's Q/Alpha during the financial crisis by analyzing the different algorithms of these two measures. OROA is a period cash flow divided by the book value of the total assets at the end of a fiscal year. Therefore, it is a revenue based profitability measure driven by business strategy, operating efficiency, management skills, expense control and other firm level characteristics. On the contrary, Tobin's Q is computed as a market value over the book value of the total assets. Since the book value of a firm is persistent, Tobin's Q is mainly driven by the market price of stocks (I use the book value of the total liability of debt plus the market value of the stocks as a proxy for the market value of the total assets). By the same token, Alpha, though excluding the effect of market risks, is also determined by the individual stock price. A large body of financial literature documents a high volatility of stock returns in recession times (for example, Veronesi, 1999). Table 8 clearly evidences that during the crisis, volatility of monthly return is as high as 12 percent, while it is only 6 percent in normal times. Economists tend to attribute high volatility to investors' uncertainty about the future growth of an economy in bad times. In addition, investors are prone to be irrational and they overreact to bad market conditions during recessions (Glode *et al.*, 2010). In my context, I argue that in the recent financial crisis, high volatility tends to attenuate a value premium of founder firms because of investors' overreacting to bad market condition by underestimating valuable stocks. Univariate difference in the difference analysis in Table 4 also supports my argument. Before the crisis the market value premium of

founder firms is 0.607, and then during the crisis it declines to 0.380, revealing a reduction of 35 percent. Moreover, market value drops before and during the crisis to 0.449 for non-family firms versus 0.664 for founder firms. Return volatility for founder firms during the crisis year 2008 is 0.112, significantly higher than non-family firms (0.098) in Table 3. I therefore ascribe the vanishing of the founder firm market value premium to investors' irrational overreaction to bad market conditions and high volatility during the crisis time.

Next, I explore the reasons for the outperformance of founder firms in the accounting measure OROA during the crisis. I use a fixed effect model to investigate other financial and investment strategy differences between founder firms and non-family firms, which may also affect accounting performance. I test the difference in capital structure, , and investment (the ratio of capital expenditure to PPE) between the founder firms and the non-family firms, controlling for other variables[18]. Table 10 presents the results.

[Insert Table 10 here]

I find that founder firms invest significantly less (at a 5 percent level) relative to non-family firms during the crisis. At the same time, however, founder firms have gained more debt and their aggregate level of debt is higher than the non-family firms. The coefficient of *Founder*crisis_acc* in the second column means that on average, the capital structure of founder firms is more leveraged by 0.9 relative to non-family firms (significant at 10 percent level). Recalling Table 3's descriptive statistics, before the crisis[19] founder firms are less leveraged and invest significantly more relative to non-family firms. The coefficients indicate that founder firms substantially change their investment and financial strategy during the crisis. I also find

[18] For the regression of investment, I follow Elull *et al.* (2010) to choose the control variables. For the regression of the capital structure and the short-term debt change, I follow Antoniou *et al.* (2008) to choose the control variables.
[19] 2008 is viewed as before the crisis for accounting performance examinations.

that the cash flow and the working capital of the founder firms are similar to those of the non-family firms[20]. If I assume that a higher leverage means better access to the credit market, the fact that the founder firms raise their debt level during the crisis suggests that they have more debt financing resources than non-family firms in bad times, when financial institutions tighten their credit granting activities. Previous studies (Morck *et al.*, 1988, 2000; Fahlenbrach, 2009, etc.) argue that founders bring differentially valuable skills to firms. "Founders may be inspiring leaders, great visionaries, or exceptionally talented scientists." (Villalonga and Amit, 2006). My findings suggest that in addition to the above mentioned skills, founders are able to obtain more financing resources, leading firms to survive times of recession. By contrast, it is widely documented that non-family firm managers are myopic and have more incentive to take on risky projects to boost current earnings (Andersen and Reeb, 2003). The incentive is even more intensified under the pressure of managerial dismissal in harsh economic conditions. In contrast, founder firms are more long-term oriented and take a conservative investment strategy during the crisis. Risky projects, especially those financed by short-term debt, are most likely to fail with financial constraints. As a result, desperate over-investment during the crisis may lead to project failure and further underperformance because of a dry-out of bank loans during the crisis.

In summary, the results show that during the financial crisis, founder firms make a more conservative investment strategy even though they may get better access to the credit market than their counterparts. Less incentive of founder firms to over-invest in risky projects to boost current earnings during the crisis explain their outperformance. On the other hand, because market performance is mainly driven by stock prices, high volatility of stock returns and

[20] I also test the difference in working capital and cash between the founder firms and the non-family firms to examine their short-term financing instruments change, which may affect their operating performance. However, I do not find significant differences.

investors' overreaction to bad market prevail during the crisis, the market value premium of founder firms may be diluted.

6. Discussion

The primary finding of this paper is that only founder firms are better performers in operating profitability (OROA). The other three types of family firms do not exhibit a significant difference relative to the non-family firms. What mechanism drives the discrepancy among founder firms and the other family firms? The founders of firms enjoy supreme and unchallenged authority and respect. They are long-visioned, highly talented, and inspiring entrepreneurs (Villalonga and Amit, 2006). In most cases, they are CEOs, decision makers, and large shareholders of the firms. To keep a sustainable growth for their young firms, founders are more likely to take a long-term-oriented strategy to helm their firms. Due to their unparalleled status in the firms, founders do not desperately take extra risky projects to boost current earnings to please board members, when the stock prices of the firms slump during the crisis. In contrast, professional CEOs in non-family firms would have more incentive to take more risks to inflate the revenue and maintain their positions. Heir firms are very similar to non-family firms. After several generations, the firms with strong family characteristics in their early stages gradually develop into professionally-managed firms. The previous characteristics of family firms fade away. Descriptive statistics in Appendix 4 demonstrate that heir firms closely resemble non-family firms in most of the dimensions. The chances are that the CEO in an heir firm is a non-founding family member. Therefore, heir firms are likely to suffer from the same myopic investment strategy to boost current earnings. The case of family-owned firms and leader/owner

firms is another picture. Unlike founder firms, which are new enterprises, family-owned and leader/owner firms are mature corporations. The controlling family or individual may not necessarily come from the founding family that focused on the growth opportunities during the early stages of the firm. When the crisis comes, however, large shareholding in the firm incurs huge capital income loss with the drop of stock prices. In this context, the controlling family or individual has more incentive than founders to boost short-term earnings to rapidly recover loss in the capital market at the cost of the small shareholders. Consequently, the family-owned firms and leader/owner firms underperform the founder firms.

Earning management is another concern when founder firms only outperform in OROA. Superiority of accounting performance is arguably attributable to the manipulation of earnings. This argument is implausible, because founder firms are less leveraged before the crisis (Table 3) and have less incentive to manipulate earnings to lobby banks to supply loans. It is financially distressful non-family firms that are more prone to conduct earning management. Even though non-family firms are more apt at manipulating earnings, founder firms are still better performers. In addition, US firms mainly contribute to the findings. La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998) rank the US as one of the countries with the best investor protection and legal environment. This sample consists of the biggest public firms. Information transparency is demanding; internal and external audits are stringent. Earning management has a slim chance to be the main driving force of outperformance.

Last, Villalonga and Amit (2006) argue that founder-CEO firms bear less agency costs than classical owner-manager firms in normal economic conditions. My paper provides new evidence in recession times to consolidate their argument, by evidencing that founder firms bear the least agency costs among non-family firms and the different types of family firms. My paper also

suggests that during the crisis, because the capital market is more risky and investors are highly overreacting, stock prices are remarkably noisy and do not reflect the intrinsic value of a firm, and that stock-based performance measures like Tobin's Q and Alpha, may not be the most appropriate measures of a firm's market performance. Further research will center on the testing of volatility-adjusted measures like Sharp Ratio.

7. Concluding remarks

It is the prevalence of family firms all over the world that makes academics pay increasing attention to family business research. One central issue is to examine whether family firms are a superior organizational form. Although a growing body of literature has made rigorous performance analyses between family firms and non-family firms in normal or good economic times, rather scant papers try to investigate the topic in recession times. This paper attempts to fill this knowledge void.

Constructing a detailed dataset from proxy filings of firms from S&P 500 (US), FTSE100 (UK), DAX 30 (Germany), CAC 40 (France) and FTSE MIB 40 (Italy) from 2006 to 2010, I aim at contributing to the literature by providing new evidence to conduct a performance examination between family firms and non-family firms during the global financial crisis since the Lehman Brother's bankruptcy in 2008.

I find that family firms, broadly defined as the sum of founder firms, heir firms, family-owned firms and leader/owner firms, comprise 35 percent of the sample. They do not significantly outperform non-family firms during the crisis whether I use market value measures (Tobin's Q/Alpha) or an accounting profitability measure (OROA). However, founder firms, as a

subgroup of family firms significantly outperform non-family firms by 18 percent in OROA during the crisis. Tobin's Q/Alpha of founder firms, by contrast, does not exhibit a difference significantly. My interpretation of this phenomenon is that Tobin's Q/Alpha is mainly driven by stock prices. High volatility and investors' overreaction during the crisis (Veronesi, 1999; Glode *et al.*, 2010) may attenuate the market value premium of founder firms.

Further testing shows that during the crisis, relative to non-family firms, founder firms invest significantly less and have better access to the credit market. I ascribe the outperformance of founder firms to less incentive to over-invest in risky projects with a high probability of failure under financial constraints to boost current earnings during the crisis.

Taken as a whole, my results support a widely-documented "founder premium" (for instance, Morck *et al.*, 1988, 2000; Fahlenbrach, 2009). Founders not only bring valuable skills in normal economic times, but also enable firms to weather the financial crisis with better expense control, more financial resource and a conservative investment strategy. My results suggest that agency costs in founder firms are the least relative to other firms during recession times. The results also suggest that when inventors tend to be irrational and stock price volatility is high, Tobin's Q and Alpha may not be the most appropriate measures of corporate performance.

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Table 1 Variable definitions

Variables	Definition
Crisis_acc	The accounting crisis year, a dummy variable which is one if the fiscal year is 2009 or 2010. This variable indicates the years when the financial crisis significantly strikes the real economy[21].
Crisis_mkt	The market crisis year, a dummy variable which is one if the fiscal year is 2008, 2009 or 2010. This variable indicates the years when the financial crisis significantly strikes the financial market.
Family	A dummy variable, which is one if the sample firm is a family firm. Family firms are the sum of all of the four subgroups of firms: (1) founder firms; (2) heir firms; (3) family-owned firms; and (4) Leader/owner firms. Please refer to the definitions of the four subgroups of family firms below.
Founder	Founder firms, a dummy variable which is one if the founder/founders of the firm holds/hold a position as a board member, or CEO, or a blockholder (has at least a 5 percent share holding).
Heir	Heir firms, a dummy variable which is one if the heir/heirs (by blood or by marriage) of the founder/founders of the firm holds/hold a position either as a board member, or CEO, or a blockholder (has at least a 5 percent share holding).
Family_owned	Family-owned firms, a dummy variable which is one if one individual or several members from the same family together hold more than 10 percent of the outstanding shares either directly or indirectly through another family firm or fund which the individual or the family controls or owns.
Leader_owner	Leader/owner firms, a dummy variable which is one if the CEO or a board member is simultaneously a significant shareholder with an outstanding ownership stake of at least 5 percent.
OROA	Operating Retunes on Assets, defined as earnings before interests and taxes (EBIT) divided by the book values of the total assets.
Tobin's Q	Market value of equity plus the book value of the total liability (book value of total asset - book value of equity) divided by the book value of the total assets.
Difference in OROA	The difference between average OROA from the period of 2009-2010 and average OROA from the period of 2006-2008.
Size	Firm size, defined as the natural logarithm of the book value of the total assets of a firm.

[21] The bankruptcy of Lehman Brother in September 22, 2008 signals the coming of the global financial crisis. The financial market reacts immediately to the event of bankruptcy and stock prices slump. Appendix 1 evidences this picture. I therefore define the market crisis years as 2008, 2009 and 2010. However, the reaction of the real economy lags behind the financial market. The crisis has had a significant effect on the real economy since 2009, which is supported by the national GDP growth rate in Appendix 2. So I define the accounting crisis years as 2009 and 2010.

Table 1, continued

Capital Structure	Debt to equity ratio, defined as the book value of the total liability (book value of the total asset - book value of the equity) divided by the book value of the total equity.
Investment	Ratio of capital expenditure to the Plant, Property and Equipment (PPE), defined as capital expenditure divided by the PPE of the last fiscal year.
Ln employee	Natural logarithm of the number of employees of the firm.
ROA	Returns on Assets, defined as net income divided by the book value of the total assets.
Working capital growth	Yearly working capital growth rate, defined as an increment of the yearly working capital divided by the working capital of the last fiscal year.
Short debt change	Yearly short-term debt increment, defined as the difference between short-term debt this fiscal year and the last fiscal year, measured in 1 billion US dollars.
Advertising	Adverting expense, defined as yearly advertising expense divided by sales.
Research	Research and development expense, defined as yearly research and development expense divided by sales.
Firm age	The difference between the incorporation year and a fiscal year.
Return volatility	Firm idiosyncratic risk, defined as the standard deviation of stock returns for the previous 36 months.
Ln cash	Natural logarithm of cash.
Sales growth rate	Yearly sales growth rate, defined as an increment of the yearly total sales divided by the total sales of the last fiscal year.
Tangibility	Tangible assets, defined as the tangible assets divided by the book values of the total assets.
Profitability	Lagged OROA, Operating Return on Assets of the last fiscal year.
Dividend payout	Dividend divided by sales.
Non-debt tax shield	Depreciation and amortization divided by the book value of the total assets.
Alpha	Annualized average monthly risk-adjusted return of stock. Monthly risk-adjusted return is the difference between the monthly before-expense return and the risk premium, defined as the vector of betas times the vector of Fama and French three factors (1993) realized in month t. I estimate the betas by a rolling regression following Gil-Bazo and Ruiz-Verdu (2009).
Old firm	A dummy variable, which is one if the sample firm is incorporated before 1960.
Sales/asset	Ratio of sales to the book value of the total assets.
Expense/asset	Ratio of selling, general administrative expense to the book value of the total assets.
Cost/asset	Ratio of costs of goods to the book value of the total assets.
Depreciation/asset	Ratio of depreciation and amortization to the book value of the total assets.

Table 2 Industry distribution of family firms, founder firms, and non-family firms

SIC code	Industry description	All firms	Family firms	Founder firms	Non-family firms	% family firms in the industry	% founder firms in the industry
10	Metal mining	11	6	1	5	55%	9%
12	Coal mining	5	0	0	5	0%	0%
13	Oil and gas extraction	29	10	6	19	34%	21%
14	Mining and quarrying of nonmetallic minerals, except fuels	1	0	0	1	0%	0%
15	General building contractors	6	5	2	1	83%	33%
16	Heavy construction, except buildings	3	2	0	1	67%	0%
17	Special trade contractors	1	0	0	1	0%	0%
20	Food and kindred products	27	14	0	13	52%	0%
21	Tobacco products	6	2	0	4	33%	0%
23	Apparel and other textile products	3	1	0	2	33%	0%
24	Lumber and wood products	2	1	0	1	50%	0%
25	Furniture and fixtures	2	1	0	1	50%	0%
26	Paper and allied products	6	0	0	6	0%	0%
27	Printing and publishing	5	2	0	3	40%	0%
28	Chemical and allied products	49	16	1	33	33%	2%
29	Petroleum and coal products	8	2	0	6	25%	0%
30	Rubber and miscellaneous plastic products	6	2	1	4	33%	17%
31	Leather and leather products	1	1	0	0	100%	0%
32	Stone, clay, and glass products	7	4	0	3	57%	0%
33	Primary metal industries	11	6	2	5	55%	18%
34	Fabricated metal products	5	0	0	5	0%	0%
35	Industrial machinery and equipment	24	8	4	16	33%	17%
36	Electronic and other electrical equipment	37	15	9	22	41%	24%
37	Transportation equipment	21	6	0	15	29%	0%
38	Instruments and related products	35	10	2	25	29%	6%
39	Miscellaneous manufacturing products	4	1	0	3	25%	0%
40	Railroad transportation	3	0	0	3	0%	0%
42	Trucking and warehousing	1	1	0	0	100%	0%
44	Water transportation	2	2	0	0	100%	0%
45	Transportation by air	4	1	1	3	25%	25%
46	Pipelines, except natural gas	1	0	0	1	0%	0%
47	Transportation services	5	3	0	2	60%	0%
48	Communications	29	14	6	15	48%	21%
49	Electric, gas, and sanitary services	55	2	0	53	4%	0%
50	Wholesale trade of durable goods	7	3	1	4	43%	14%
51	Wholesale trade of nondurable goods	8	2	2	6	25%	25%
52	Building materials and gardening	3	1	0	2	33%	0%
53	General merchandise stores	13	7	2	6	54%	15%
54	Food stores	6	3	0	3	50%	0%
55	Auto dealers and service stations	3	2	0	1	67%	0%
56	Apparel and accessory stores	8	4	3	4	50%	38%
57	Furniture and home furnishings	4	2	2	2	50%	50%
58	Eating and drinking places	6	1	0	5	17%	0%
59	Miscellaneous retail	7	3	2	4	43%	29%

Table 2, continued

60	Depository institutions	4	0	0	4	0%	0%
61	Nondepository institutions	7	1	1	6	14%	14%
62	Security and commodity brokers	11	3	3	8	27%	27%
63	Insurance carriers	32	12	6	20	38%	19%
64	Insurance agents, brokers, services	1	0	0	1	0%	0%
65	Real estate	1	1	0	0	100%	0%
67	Holding And Other Investment Offices	48	16	8	32	33%	17%
70	Hotels and other lodging places	7	4	1	3	57%	14%
72	Personal services	2	2	2	0	100%	100%
73	Business services	44	18	13	26	41%	30%
75	Auto repair, services, and parking	1	0	0	1	0%	0%
78	Motion pictures	1	1	1	0	100%	100%
79	Amusement and recreation services	1	1	0	0	100%	0%
80	Health services	5	0	0	5	0%	0%
82	Educational services	2	2	2	0	100%	100%
87	Engineering and management services	10	3	1	7	30%	10%
95	Admin-Environ Quality, Housing	1	0	0	1	0%	0%
	Total	658	232	85	426	35%	13%

Number and percent of firms by primary two-digit SIC code. Family firms are defined as the sum of all of the four subgroups of firms: (1) founder firms; (2) heir firms; (3) family-owned firms; and (4) Leader/owner firms. Founder firms are firms where the founder/founders of the firm holds/hold a position as a board member, CEO, or a blockholder (has at least a 5 percent share holding). Heir firms are firms where the heir/heirs (by blood or by marriage) of the founder/founders of the firm holds/hold a position either as a board member, CEO, or a blockholder (has at least a 5 percent share holding). Family-owned firms are firms where one individual or several members from the same family together hold more than 10 percent of the outstanding shares either directly or indirectly through another family firm or fund which the individual or the family controls or owns. Leader/owner firms are firms where the CEO or a board member is simultaneously a significant shareholder with an outstanding ownership stake of at least 5 percent. The sample comprises 658 firms from S&P 500 (US), FTSE100 (UK), DAX 30 (Germany), CAC 40 (France) and FTSE MIB 40 (Italy) in the 2011 index company lists.

Table 3 Descriptive statistics of family firms, founder firms, and non-family firms in 2008

	Non-family firms (I)			All family firms (II)			Founder firms (III)			Difference in Mean			
	Obs	Mean	Std.Dev.	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.	(I)-(II)		(I)-(III)	
Size	428	9.602	1.535	230	9.206	1.321	85	8.931	1.356	0.396	***	0.671	***
Capital Structure	428	3.837	6.051	230	2.469	3.888	85	1.729	2.415	1.368	***	2.108	***
Investment	391	0.125	0.079	213	0.155	0.109	79	0.181	0.121	-0.030	***	-0.056	***
Ln employee	420	3.064	1.421	223	2.945	1.579	84	2.434	1.515	0.119		0.630	***
ROA	351	0.054	0.080	154	0.045	0.102	74	0.052	0.107	0.009		0.001	
OROA	425	0.110	0.080	229	0.110	0.082	85	0.110	0.094	0.000		-0.001	
Tobin's Q	419	1.632	1.000	222	1.713	1.088	83	1.886	1.238	-0.081		-0.254	**
Working capital growth	371	-0.291	2.530	205	-0.029	1.697	73	-0.072	1.026	-0.263		-0.219	
Short debt change	426	-0.070	1.993	229	0.015	1.181	85	-0.058	1.121	-0.085		-0.012	
Advertising	427	0.008	0.019	230	0.014	0.029	85	0.017	0.031	-0.006	***	-0.010	***
Research	427	0.028	0.056	230	0.030	0.061	85	0.045	0.076	-0.002		-0.017	**
Firm age	428	53.439	46.681	230	48.717	44.366	85	28.988	19.894	4.722		24.451	***
Return volatility	418	0.098	0.065	221	0.103	0.037	82	0.112	0.032	-0.005		-0.014	*
Alpha	320	0.004	0.023	136	0.008	0.022	66	0.010	0.023	-0.004	*	-0.006	**
Ln cash	418	6.498	1.601	226	6.393	1.511	83	6.440	1.466	0.105		0.058	
Sales/asset	428	0.862	0.702	230	0.895	0.634	85	0.880	0.704	-0.033		-0.018	
Expense/asset	346	0.170	0.154	204	0.194	0.172	72	0.232	0.174	-0.025	*	-0.062	***
Cost/asset	428	0.570	0.600	230	0.563	0.536	85	0.527	0.580	0.007		0.043	
Depreciation/asset	414	0.035	0.022	221	0.037	0.022	80	0.042	0.028	-0.002		-0.007	**

This table reports means, standard deviations, and tests between means of non-family firms, family firms, and founder firms in 2008. Family firms are defined as the sum of all of the four subgroups of firms: (1) founder firms; (2) heir firms; (3) family-owned firms; and (4) Leader/owner firms. Founder firms are firms where the founder/founders of the firm holds/hold a position as a board member, CEO, or a blockholder (has at least a 5 percent share holding). Heir firms are firms where the heir/heirs (by blood or by marriage) of the founder/founders of the firm holds/hold a position either as a board member, CEO, or a blockholder (has at least a 5 percent share holding). Family-owned firms are firms where one individual or several members from the same family together hold more than 10 percent of outstanding shares either directly or indirectly through another family firm or fund which the individual or the family controls or owns. Leader/owner firms are firms where the CEO or a board member is simultaneously a significant shareholder with an outstanding ownership stake of at least 5 percent. Non-family firms are all remaining sample firms that do not fulfill my criteria of family firms. Size is the natural logarithm of the book value of the total assets of a firm. Capital structure is the book value of the total liability (the book value of the total asset – the book value of the equity) divided by the book value of the total equity. Investment is capital expenditure divided by the PPE of the last fiscal year. Ln employee is a natural logarithm of the number of employees in the firm. ROA is net income divided by the book value of the total assets. OROA is earnings before interests and taxes (EBIT) divided by the book values of the total assets. Tobin's Q is the market value of the equity plus the book value of the total liability (the book value of the total asset – the book value of the equity) divided by the book value of the total assets. Working capital growth is the yearly working capital growth rate, defined as an increment of yearly working capital divided by working capital of the last fiscal year. Short debt change is the yearly short-term debt increment, defined as the difference between short-term debt this fiscal year and the last fiscal year, measured in 1 billion US dollars. Advertising is yearly advertising expense divided by sales. Research is yearly research and development expense divided by sales. Firm age is the difference between the incorporation year and a fiscal year. Return volatility is firm idiosyncratic risk, defined as the standard deviation of stock returns for the previous 36 months. Alpha is an annualized average monthly risk-adjusted return of stock. Monthly risk-adjusted return is the difference between the monthly before-expense return and the risk premium, defined as the vector of betas times the vector of Fama and French three factors (1993) realized in month t. I estimate the betas by a rolling regression following Gil-Bazo and Ruiz-Verdu (2009). Ln cash is the natural logarithm of cash. Sales/asset is the ratio of sales to the book value of the total assets. Expense/asset is ratio of selling, general administrative expense to the book value of the total assets. Cost/asset is the ratio of costs of goods to the book value of the total assets. Depreciation/asset is the ratio of depreciation and amortization to the book value of the total assets. The sample comprises 658 firms from S&P 500 (US), FTSE100 (UK), DAX 30 (Germany), CAC 40 (France) and FTSE MIB 40 (Italy) in the 2011 index company lists. Robust standard errors are reported in parentheses. Asterisks denote statistical significance at 10 percent (*), 5 percent (**) and 1 percent level (***) respectively.

Table 4 Performance before and during the crisis of family firms, founder firms, and non-family firms

	Non-family firms (I)				All family firms (II)				Founder firms (III)				Difference in Mean			
	Obs	Mean		Std. Dev.	Obs	Mean		Std. Dev.	Obs	Mean		Std. Dev.	(I)-(II)		(I)-(III)	
OROA (before crisis, 2006-2008)	425	0.111		0.074	229	0.113		0.072	85	0.116		0.081	-0.002		-0.005	
OROA (during crisis, 2009-2010)	425	0.096		0.072	229	0.100		0.072	85	0.111		0.087	-0.004		-0.015	*
Difference in OROA (during-before)	425	-0.016	***	0.046	229	-0.014	***	0.050	85	-0.005		0.055	-0.002		-0.010	*
Tobin's Q (before crisis, 2006-2007)	413	2.205		1.321	221	2.438		1.465	83	2.811		1.749	-0.233	**	-0.607	***
Tobin's Q (during crisis, 2008-2010)	413	1.756		1.016	221	1.896		1.106	83	2.148		1.290	-0.125		-0.380	***
Difference in Tobin's Q (during -before)	413	-0.449	***	0.681	221	-0.541	***	0.764	83	-0.664	***	1.038	0.093		0.215	**

This table reports the means, standard deviations and tests between means of performance before and during the financial crisis of family firms, founder firms, and non-family firms from 2006 to 2010. Family firms are defined as the sum of all of the four subgroups of firms: (1) founder firms; (2) heir firms; (3) family-owned firms; and (4) Leader/owner firms. Founder firms are firms where the founder/founders of the firm holds/hold a position as a board member, CEO, or a blockholder (has at least a 5 percent share holding). Heir firms are firms where the heir/heirs (by blood or by marriage) of the founder/founders of the firm holds/hold a position either as a board member, CEO, or a blockholder (has at least a 5 percent share holding). Family-owned firms are firms where one individual or several members from the same family together hold more than 10 percent of outstanding shares either directly or indirectly through another family firm or fund which the individual or the family controls or owns. Leader/owner firms are firms where the CEO or a board member is simultaneously a significant shareholder with an outstanding ownership stake of at least 5 percent. Non-family firms are all remaining sample firms that do not fulfill my criteria of family firms. Size is the natural logarithm of the book value of the total assets of a firm. OROA is earnings before interests and taxes (EBIT) divided by the book values of the total assets. Tobin's Q is the market value of the equity plus the book value of the total liability (the book value of the total asset – the book value of the equity) divided by the book value of the total assets. The sample comprises 658 firms from S&P 500 (US), FTSE100 (UK), DAX 30 (Germany), CAC 40 (France) and FTSE MIB 40 (Italy) in the 2011 index company lists. Robust standard errors are reported in parentheses. Asterisks denote statistical significance at 10 percent (*), 5 percent (**) and 1 percent level (***) respectively.

Table 5 Performance of family firms vs. non-family firms during the financial crisis

	Dependent Variable				
	OROA			Tobin's Q	
Crisis_acc	-0.001		Crisis_mkt	-2.139	***
	(0.018)			(0.381)	
Family*Crisis_acc	0.005		Family*Crisis_mkt	0.075	
	(0.004)			(0.092)	
Size	-0.023	***	Size	-0.373	***
	(0.008)			(0.076)	
Capital structure	0.000		Capital structure	0.029	***
	(0.000)			(0.010)	
Ln employee	0.015	*	Ln employee	0.214	*
	(0.009)			(0.124)	
Investment	-0.075	**	Investment	-0.516	
	(0.033)			(0.541)	
Advertising	-0.583	*	Advertising	-4.515	
	(0.329)			(4.149)	
Research	0.097		Research	1.622	
	(0.083)			(1.432)	
Firm age	0.003	**	Firm age	0.085	***
	(0.001)			(0.022)	
Return volatility	0.186	***	Return volatility	0.666	
	(0.061)			(0.613)	
Size*Crisis_acc	-0.001		Size*Crisis_mkt	0.161	***
	(0.002)			(0.046)	
Capital structure*Crisis_acc	0.001	**	Capital structure*Crisis_mkt	-0.025	**
	(0.000)			(0.011)	
Ln employee*Crisis_acc	0.000		Ln employee*Crisis_mkt	-0.032	
	(0.002)			(0.044)	
Investment*Crisis_acc	-0.067	**	Investment*Crisis_mkt	-0.734	
	(0.026)			(0.591)	
Advertising*Crisis_acc	0.271	***	Advertising*Crisis_mkt	7.622	***
	(0.078)			(1.976)	
Research*Crisis_acc	0.089	***	Research*Crisis_mkt	-0.626	
	(0.034)			(1.203)	
Firm age*Crisis_acc	0.000	*	Firm age*Crisis_mkt	0.001	
	(0.000)			(0.001)	
Return volatility*Crisis_acc	-0.106	**	Return volatility*Crisis_mkt	0.357	
	(0.045)			(0.297)	
_cons	0.136		_cons	1.024	
	(0.084)			(1.242)	
Within R-sq	0.144		Within R-sq	0.268	
N	2022		N	2022	

This table reports results of the firm fixed effect model regression of firm performance before and during the financial crisis from 2006 to 2010. Family* Crisis_acc is an interaction between the variables Family and Crisis_acc. Crisis_acc is a dummy which is one if the fiscal year is 2009 or 2010. This variable indicates the years when the financial crisis significantly strikes the real economy. Family*Crisis_mkt is an interaction between the variables Family and Crisis_mkt. Crisis_mkt is a dummy which is one if the fiscal year is 2008, 2009 or 2010. This variable indicates the years when the financial crisis significantly strikes the financial market. Family is a dummy variable, which is one if the sample firm is a family firm. Family firms are the sum of all the four subgroups of firms: (1) founder firms; (2) heir firms; (3) family-owned firms; and (4) Leader/owner firms. Founder firms are firms where the founder/founders of the firm holds/hold a position as a board member,CEO, or a blockholder (has at least a 5 percent share holding). Heir firms are firms where the heir/heirs (by blood or by marriage) of the founder/founders of the firm holds/hold a position either as a board member, CEO, or a blockholder (has at least a 5 percent share holding). Family-owned firms are firms where one individual or several members from the same family together hold more than 10 percent of the outstanding shares either directly or indirectly through another family firm or fund which the individual or the family controls or owns. Leader/owner firms are firms where the CEO or a board member is simultaneously a significant shareholder with an outstanding ownership stake of at least 5 percent. OROA is earnings before interests and taxes (EBIT) divided by the book values of the total assets. Tobin's Q is the market value of the equity plus the book value of the total liability (the book value of the total asset – the book value of the equity) divided by the book value of the total assets. Size is the natural logarithm of the book value of the total assets of a firm. Capital structure is the book value of the total liability (the book value of the total asset – the book value of the equity) divided by the book value of the total equity. Investment is the capital expenditure divided by the PPE of the last fiscal year. Ln employee is natural logarithm of the number of employees of the firm. Advertising is yearly advertising expense divided by sales. Research is yearly research and development expense divided by sales. Firm age is the difference between the incorporation year and a fiscal year. Return volatility is firm idiosyncratic risk, defined as the standard deviation of stock returns for the previous 36 months. Size*Crisis_mkt (Size*Crisis_acc), Capital Structure*Crisis_mkt(Capital Structure*Crisis_acc), Ln employee*Crisis_mkt (Ln employee*Crisis_acc), Investment*Crisis_mkt(Investment*Crisis_acc),Advertising*Crisis_mkt(Advertising*Crisis_acc),Research*Crisis_mkt(Research*Crisis_acc), Firm age*Crisis_mkt (Firm age*Crisis_acc) and Return volatility*Crisis_mkt (Return volatility*Crisis_acc) are interactions between Crisis_mkt (Crisis_acc) and Size, Capital Structure, Ln employee, Investment, Advertising, Research, Firm age and Return volatility respectively. The sample comprises 658 firms from S&P 500 (US), FTSE100 (UK), DAX 30 (Germany), CAC 40 (France) and FTSE MIB 40 (Italy) in the 2011 index company lists. Robust standard errors are reported in parentheses. Asterisks denote statistical significance at 10 percent (*), 5 percent (**) and 1 percent level (***) respectively.

Table 6 Fixed effect estimation of founder firm outperformance in OROA during the crisis

	Dependent Variable				
	OROA			Tobin's Q	
Crisis_acc	-0.001		Crisis_mkt	-2.156	***
	(0.018)			(0.391)	
Founder*Crisis_acc	0.017	**	Founder*Crisis_mkt	0.107	
	(0.009)			(0.177)	
Heir*Crisis_acc	0.001		Heir*Crisis_mkt	0.195	
	(0.006)			(0.118)	
Family_owned*Crisis_acc	0.001		Family_owned*Crisis_mkt	-0.055	
	(0.007)			(0.105)	
Leader_owner*Crisis_acc	-0.009		leader_owner*Crisis_mkt	-0.094	
	(0.008)			(0.127)	
Size	-0.024	***	Size	-0.379	***
	(0.008)			(0.077)	
Capital structure	0.000		Capital structure	0.030	***
	(0.000)			(0.010)	
Ln employee	0.016	*	Ln employee	0.222	*
	(0.009)			(0.125)	
Investment	-0.068	**	Investment	-0.529	
	(0.031)			(0.566)	
Advertising	-0.611	*	Advertising	-4.585	
	(0.329)			(4.205)	
Research	0.120		Research	1.706	
	(0.082)			(1.454)	
Firm age	0.003	**	Firm age	0.086	***
	(0.001)			(0.022)	
Return volatility	0.184	***	Return volatility	0.691	
	(0.063)			(0.624)	
Size*Crisis_acc	-0.001		Size*Crisis_mkt	0.166	***
	(0.002)			(0.047)	
Capital structure*Crisis_acc	0.001	**	Capital structure*Crisis_mkt	-0.025	**
	(0.000)			(0.011)	
Ln employee*Crisis_acc	0.000		Ln employee*Crisis_mkt	-0.034	
	(0.002)			(0.046)	
Investment*Crisis_acc	-0.069	***	Investment*Crisis_mkt	-0.685	
	(0.027)			(0.613)	
Advertising*Crisis_acc	0.274	***	Advertising*Crisis_mkt	7.676	***
	(0.074)			(2.048)	
Research*Crisis_acc	0.080	**	Research*Crisis_mkt	-0.672	
	(0.035)			(1.195)	
Firm age*Crisis_acc	0.000		Firm age*Crisis_mkt	0.001	
	(0.000)			(0.001)	
Return volatility*Crisis_acc	-0.108	**	Return volatility*Crisis_mkt	0.348	
	(0.046)			(0.308)	
_cons	0.126		_cons	1.021	
	(0.082)			(1.250)	
Within R-sq	0.149		Within R-sq	0.270	
N	2022		N	2022	

This table reports results of firm fixed effect model regressions of firm performance before and during the financial crisis from 2006 to 2010. Founder*Crisis_acc (Founder*Crisis_mkt), Heir*Crisis_acc (Heir*Crisis_mkt), Family_owned*Crisis_acc(Family_owned*Crisis_mkt) and Leader_owner*Crisis_acc (Leader_owner*Crisis_mkt) are interactions between dummy variable: Founder, Heir, Family_owned, or Leader_owner and dummy variable: Crisis_acc (Crisis_mkt). Crisis_acc is a dummy which is one if the fiscal year is 2009 and 2010. This variable indicates the years when the financial crisis significantly strikes real economy. Crisis_mkt is a dummy which is one if fiscal year is 2008, 2009 and 2010. This variable indicates the years when the financial crisis significantly strikes the financial market. Founder firms are firms where the founder/founders of the firm holds/hold a position as a board member,CEO, or a blockholder (has at least a 5 percent share holding). Heir firms are firms where the heir/heirs (by blood or by marriage) of the founder/founders of the firm holds/hold a position either as a board member, CEO, or a blockholder (has at least a 5 percent share holding). Family-owned firms are firms where one individual or several members from the same family together hold more than 10 percent of the outstanding shares either directly or indirectly through another family firm or fund which the individual or the family controls or owns. Leader/owner firms are firms where the CEO or a board member is simultaneously a significant shareholder with an outstanding ownership stake of at least 5 percent. OROA is earnings before interests and taxes (EBIT) divided by the book values of the total assets. Tobin's Q is the market value of the equity plus the book value of the total liability (the book value of the total asset – the book value of the equity) divided by the book value of the total assets. Size is the natural logarithm of the book value of the total assets of a firm. Capital structure is the book value of the total liability (the book value of the total asset – the book value of the equity) divided by the book value of the total equity. Investment is the capital expenditure divided by the PPE of the last fiscal year. Ln employee is natural logarithm of the number of employees of the firm. Advertising is yearly advertising expense divided by sales. Research is yearly research and development expense divided by sales. Firm age is the difference between the incorporation year and a fiscal year. Return volatility is firm idiosyncratic risk, defined as the standard deviation of stock returns for the previous 36 months. Size*Crisis_mkt (Size*Crisis_acc),Capital Structure*Crisis_mkt(CapitalStructure*Crisis_acc),Lnemployee*Crisis_mkt (Lnemployee*Crisis_acc), Investment*Crisis_mkt(Investment*Crisis_acc),Advertising*Crisis_mkt(Advertising*Crisis_acc),Research*Crisis_mkt(Research*Crisis_acc), Firm age*Crisis_mkt (Firm age*Crisis_acc) and Return volatility*Crisis_mkt (Return volatility*Crisis_acc) are interactions between Crisis_mkt (Crisis_acc) and Size, Capital Structure, Ln employee, Investment, Advertising, Research, Firm age and Return volatility respectively. The sample comprises 658 firms from S&P 500 (US), FTSE100 (UK), DAX 30 (Germany), CAC 40 (France) and FTSE MIB 40 (Italy) in the 2011 index company lists. Robust standard errors are reported in parentheses. Asterisks denote statistical significance at 10 percent (*), 5 percent (**) and 1 percent level (***) respectively.

Table 7 IV two stage OLS estimation of founder firm outperformance in OROA during the crisis

First stage regression			Second stage regression		
Dependent variable: Founder			Dependent variable: Difference in OROA		
Old firm	-0.141	***	Founder	0.059	*
	(0.024)			(0.031)	
Difference in Size	0.078		Difference in Size	-0.060	***
	(0.064)			(0.011)	
Difference in Capital structure	0.002		Difference in Capital structure	0.001	
	(0.003)			(0.001)	
Difference in Ln employee	0.014		Difference in Ln employee	0.047	***
	(0.073)			(0.012)	
Difference in Advertising	7.763	**	Difference in Advertising	-0.246	
	(3.572)			(0.553)	
Difference in Research	-0.329		Difference in Research	-0.389	**
	(1.417)			(0.162)	
Difference in Return volatility	-0.626		Difference in Return volatility	-0.128	
	(0.397)			(0.081)	
Difference in Investment	-1.143	***	Difference in Investment	0.103	*
	(0.342)			(0.057)	
_cons	0.174	***	_cons	-0.011	*
	(0.028)			(0.005)	
R-squared	0.0019		R-squared	0.1082	
N	574		N	574	

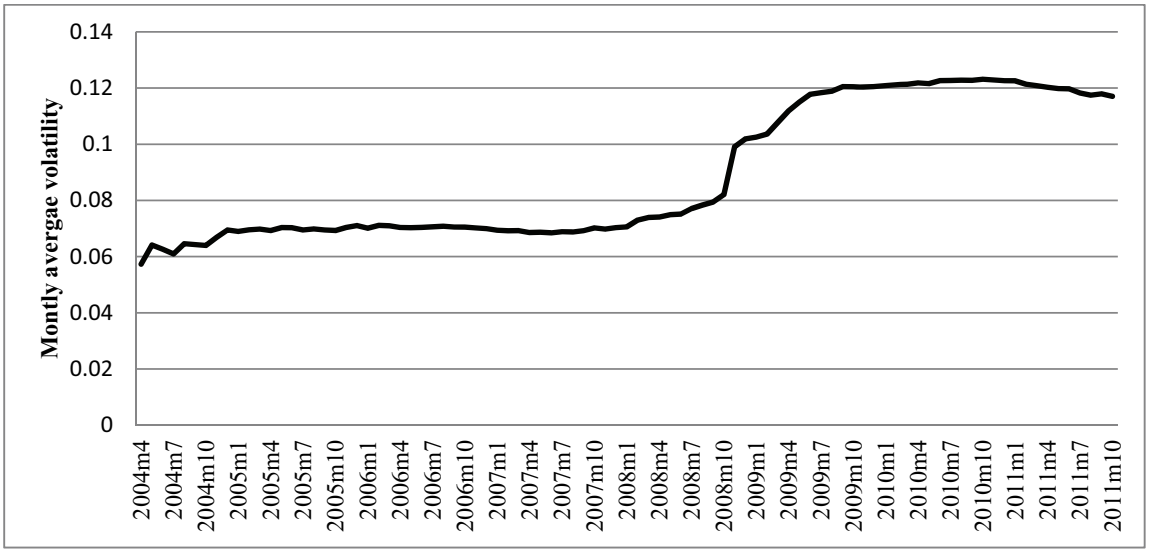
This table reports results of IV two stage OLS regression of firm performance before and during the financial crisis on founder dummy. Founder is a dummy which equals one if a firm is a founder firm. Founder firms are firms where the founder/founders of the firm holds/hold a position as a board member,CEO, or a blockholder (has at least a 5 percent share holding). Difference in OROA is the difference between average OROA of the period from 2009-2010 and average OROA of the period from 2006-2008.OROA is the earnings before interests and taxes (EBIT) divided by the book values of the total assets. Old firm is a dummy variable, which is one if the sample firm is incorporated before 1960. Difference in Size is the difference between the average size of the period from 2009-2010 and the average size of the period from 2006-2008.Size is the natural logarithm of the book value of the total assets of a firm. Difference in capital structure is the difference between the average capital structure of the period from 2009-2010 and the average capital structure of the period from 2006-2008.Capital structure is the book value of the total liability (the book value of the total asset – the book value of the equity) divided by the book value of the total equity. Difference in Investment is the difference between the average investment of the period from 2009-2010 and the average investment of the period from 2006-2008. Investment is the capital expenditure divided by the PPE of the last fiscal year. Difference in Ln employee is the difference between average Ln employee of the period from 2009-2010 and the average Ln employee of the period from 2006-2008. Ln employee is the natural logarithm of the number of employees in the firm. Difference in advertising is the difference between the average advertising of the period from 2009-2010 and average Advertising of the period from 2006-2008.Advertising is yearly advertising expense divided by the sales. Difference in research is the difference between the average research of the period from 2009-2010 and the average research of the period from 2006-2008. Research is the yearly research and the development expense divided by the sales. Difference in return volatility is the difference between the average return volatility of the period from 2009-2010 and the average return volatility of the period from 2006-2008.Return volatility is firm idiosyncratic risk, defined as the standard deviation of stock returns for the previous 36 months. The sample comprises 658 firms from S&P 500 (US), FTSE100 (UK), DAX 30 (Germany), CAC 40 (France) and FTSE MIB 40 (Italy) in the 2011 index company lists. Robust standard errors are reported in parentheses. Asterisks denote statistical significance at 10 percent (*), 5 percent (**) and 1 percent level (***) respectively.

Table 8 Fixed effect estimation of an alternative measure of market performance (Alpha)

	Dependent variable: Alpha			
Crisis_mkt	0.060	*	0.060	*
	(0.034)		(0.032)	
Family*Crisis_mkt	0.007			
	(0.008)			
Founder*Crisis_mkt			0.013	
			(0.010)	
Heir*Crisis_mkt			0.008	
			(0.011)	
Family_owned*Crisis_mkt			-0.001	
			(0.009)	
Leader_owner*Crisis_mkt			-0.016	
			(0.013)	
Size	-0.007		-0.008	
	(0.008)		(0.008)	
Capital structure	0.005	**	0.006	***
	(0.002)		(0.002)	
Ln employee	0.001		0.002	
	(0.010)		(0.010)	
Investment	0.055		0.071	*
	(0.038)		(0.039)	
Advertising	0.400		0.357	
	(0.284)		(0.287)	
Research	-0.077		-0.039	
	(0.088)		(0.096)	
Firm age	-0.004	***	-0.004	***
	(0.001)		(0.001)	
Return volatility	0.188		0.170	
	(0.184)		(0.178)	
Size*Crisis_mkt	-0.005		-0.003	
	(0.004)		(0.004)	
Capital structure*Crisis_mkt	-0.005	**	-0.006	**
	(0.002)		(0.002)	
Ln employee*Crisis_mkt	0.004		0.003	
	(0.003)		(0.004)	
Investment*Crisis_mkt	-0.048		-0.063	
	(0.039)		(0.040)	
Advertising*Crisis_mkt	-0.002		0.036	
	(0.125)		(0.129)	
Research*Crisis_mkt	0.042		0.003	
	(0.085)		(0.088)	
Firm age*Crisis_mkt	0.000		0.000	
	(0.000)		(0.000)	
Return volatility*Crisis_mkt	-0.075		-0.058	
	(0.180)		(0.174)	
_cons	0.242	***	0.239	***
	(0.066)		(0.065)	
Within R-sq	0.057		0.059	
N	1296		1296	

This table reports results of firm fixed effect model regressions of risk-adjusted return of stock before and during the financial crisis from 2006 to 2010. Family*Crisis_mkt, Founder*Crisis_mkt, Heir*Crisis_mkt, Family_owned*Crisis_mkt and Leader_owner*Crisis_mkt are interactions between dummy variable: Family, Founder, Heir, Family_owned, or Leader_owner and dummy variable Crisis_mkt. Crisis_mkt is a dummy which is one if fiscal year is 2008, 2009 or 2010. This variable indicates the years when the financial crisis significantly strikes the financial market. Family is a dummy variable, which is one if the sample firm is a family firm.Founder firms are firms where the founder/founders of the firm holds/hold a position as a board member,CEO, or a blockholder (has at least a 5 percent share holding). Heir firms are firms where the heir/heirs (by blood or by marriage) of the founder/founders of the firm holds/hold a position either as a board member, CEO, or a blockholder (has at least a 5 percent share holding). Family-owned firms are firms where one individual or several members from the same family together hold more than 10 percent of the outstanding shares either directly or indirectly through another family firm or fund which the individual or the family controls or owns. Leader/owner firms are firms where the CEO or a board member is simultaneously a significant shareholder with an outstanding ownership stake of at least 5 percent. Alpha is annualized average monthly risk-adjusted return of stock. Monthly risk-adjusted return is the difference between monthly before-expense return and risk premium, defined as the vector of betas times the vector of Fama and French three factors (1993) realized in month t. I estimate the betas by a rolling regression following Gil-Bazo and Ruiz-Verdu (2009). Size is the natural logarithm of the book value of the total assets of a firm. Capital structure is the book value of the total liability (the book value of the total asset – the book value of the equity) divided by the book value of the total equity. Investment is the capital expenditure divided by the PPE of the last fiscal year. Ln employee is natural logarithm of the number of employees of the firm. Advertising is yearly advertising expense divided by sales. Research is yearly research and development expense divided by sales. Firm age is the difference between the incorporation year and a fiscal year. Return volatility is firm idiosyncratic risk, defined as the standard deviation of stock returns for the previous 36 months. Size*Crisis_mkt, Capital Structure*Crisis_mkt, Ln employee*Crisis_mkt, Investment*Crisis_mkt, Advertising*Crisis_mkt, Research*Crisis_mkt, Firm age*Crisis_mkt and Return volatility*Crisis_mkt are interactions between Crisis_mkt and Size, Capital Structure, Ln employee, Investment, Advertising, Research, Firm age and Return volatility respectively. The sample comprises 456 firms from S&P 500 (US) in the 2011 index company lists. Robust standard errors are reported in parentheses. Asterisks denote statistical significance at 10 percent (*), 5 percent (**) and 1 percent level (***) respectively.

Table 9 Monthly average return volatility of the sample firms



Notes: This table shows the average monthly return volatility of the sample. Return volatility is firm idiosyncratic risk, defined as the standard deviation of stock returns for the previous 36 months. Source: Datastream.

Table 10 Finance and investment strategy of founder firms during the crisis

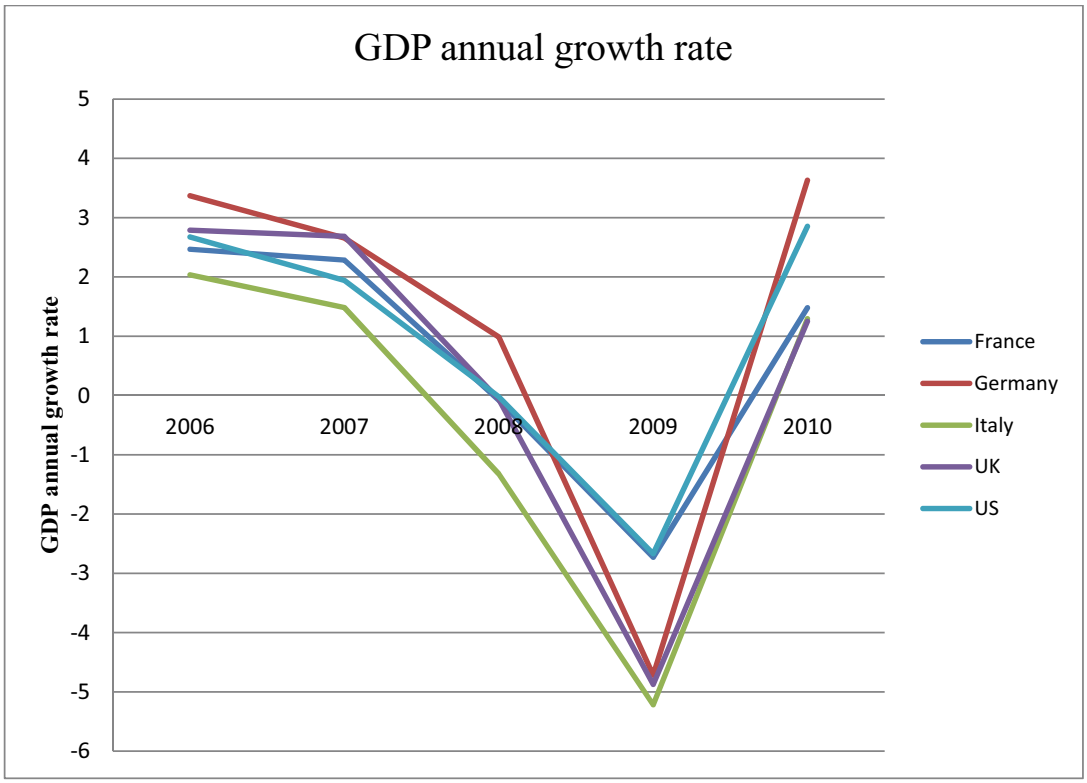
	Dependent Variable			
	Investment		Capital structure	
Crisis_acc	-0.048	**	4.551	***
	(0.024)		(1.678)	
Founder*Crisis_acc	-0.022	**	0.878	*
	(0.010)		(0.464)	
Heir*Crisis_acc	-0.004		-0.325	
	(0.008)		(0.413)	
Family_owned*Crisis_acc	0.012	*	-0.041	
	(0.007)		(0.219)	
Leader_owner*Crisis_acc	-0.012		-0.527	
	(0.009)		(0.396)	
Size	0.001		0.888	*
	(0.008)		(0.472)	
Tobin's Q	0.018	***	0.010	
	(0.004)		(0.172)	
Firm age	-0.003			
	(0.002)			
Ln cash	0.000			
	(0.003)			
Profitability			-2.276	
			(1.952)	
Tangibility			2.413	
			(1.454)	
Dividend payout			5.106	
			(6.847)	
Non-debt tax shield			16.769	
			(10.533)	
Return volatility			0.057	
			(5.380)	
Size*Crisis_acc	0.002		-0.411	***
	(0.003)		(0.135)	
Tobin's Q*Crisis_acc	0.004		-0.379	**
	(0.003)		(0.169)	
Firm age*Crisis_acc	0.000			
	(0.000)			
Ln cash*Crisis_acc	0.000			
	(0.002)			
Profitability*Crisis_acc			1.162	
			(1.933)	
Tangibility*Crisis_acc			-0.282	
			(0.489)	
Dividend payout*Crisis_acc			7.557	
			(4.646)	
Non-debt tax shield*Crisis_acc			6.017	
			(6.451)	
Return volatility*Crisis_acc			-7.391	
			(5.515)	
_cons	0.202	**	-7.632	
	(0.087)		(5.518)	
Within R-sq	0.220		0.038	
N	2504		2432	

This table reports results of firm fixed effect model regressions of firm accounting performance before and during the financial crisis from 2006 to 2010. Founder*Crisis_acc, Heir*Crisis_acc, Family_owned*Crisis_acc and Leader_owner*Crisis_acc are interactions between dummy variable: Founder, Heir, Family_owned, or Leader_owner and dummy variable: Crisis_acc. Crisis_acc is a dummy which is one if the fiscal year is 2009 and 2010. This variable indicates the years when the financial crisis significantly strikes real economy. Founder is a dummy which equals one if a firm is a founder firm. Founder firms are firms where the founder/founders of the firm holds/hold a position as a board member,CEO, or a blockholder (has at least a 5 percent share holding). Heir firms are firms where the heir/heirs (by blood or by marriage) of the founder/founders of the firm holds/hold a position either as a board member, CEO, or a blockholder (has at least a 5 percent share holding). Family-owned firms are firms where one individual or several members from the same family together hold more than 10 percent of the outstanding shares either directly or indirectly through another family firm or fund which the individual or the family controls or owns. Leader/owner firms are firms where the CEO or a board member is simultaneously a significant shareholder with an outstanding ownership stake of at least 5 percent. Investment is the capital expenditure divided by the PPE of the last fiscal year. Capital structure is the book value of the total liability (the book value of the total asset – the book value of the equity) divided by the book value of the total equity. Ln cash is the natural logarithm of cash. Size is the natural logarithm of the book value of the total assets of a firm. Tobin's Q is the market value of equity plus the book value of total liability (book value of total asset -book value of equity) divided by the book value of the total assets. Firm age is the difference between the incorporation year and a fiscal year. Profitability is Operating Return on Assets of last fiscal year. Tangibility is tangible assets divided by the book values of the total assets. Dividend payout is the dividend divided by the sales. Non-debt tax shield is the depreciation and amortization divided by the book value of the total assets. Return volatility is firm idiosyncratic risk, defined as the standard deviation of stock returns for the previous 36 months. Size*Crisis_acc, Capital Structure*Crisis_acc, Ln employee*Crisis_acc, Investment*Crisis_acc,Ln cash*Crisis_acc, Advertising*Crisis_acc, Research*Crisis_acc, Firm age*Crisis_acc and Return volatility*Crisis_acc, Profitability*Crisis_acc, Tangibility*Crisis_acc, Dividend payout*Crisis_acc, Non-debt tax shield*Crisis_acc and Tobin's Q*Crisis_acc are interactions between Crisis_acc and Size, Capital Structure, Ln employee, Investment, Ln cash, Advertising, Research, Firm age, Return volatility, Profitability, Tangibility, Dividend payout, Non-debt tax shield and Tobin's Q respectively. The sample comprises 658 firms from S&P 500 (US), FTSE100 (UK), DAX 30 (Germany), CAC 40 (France) and FTSE MIB 40 (Italy) in the 2011 index company lists. Robust standard errors are reported in parentheses. Asterisks denote statistical significance at 10 percent (*), 5 percent (**) and 1 percent level (***) respectively.

Appendix 1 S&P index slumps in September 2008

Source: Yahoo finance (finance.yahoo.com)

Appendix 2 GDP annual growth rate for the US, the UK, Germany, France, and Italy



Source: world Bank

Appendix 3 Descriptive statistics of heir firms, family-owned firms, leader/owner firms, and non-family firms in 2008

	Non-family firms (1)			Heir firms (2)			Family-owned firms (3)			Leader/owner firms (4)			Difference in Mean					
	Obs	Mean	Std Dev.	Obs	Mean	Std. Dev.	Obs	Mean	Std.Dev.	Obs	Mean	Std.Dev.	(1)-(2)		(1)-(3)		(1)-(4)	
Size	428	9.602	1.535	74	9.308	1.068	159	9.259	1.376	132	9.184	1.401	0.294		0.344	**	0.418	***
Capital Structure	428	3.837	6.051	74	1.814	2.222	159	2.682	4.265	132	2.411	4.070	2.023	***	1.155	**	1.425	**
Investment	391	0.125	0.079	68	0.126	0.077	150	0.143	0.102	118	0.159	0.110	-0.001		-0.019	**	-0.035	***
Ln Employee	420	3.064	1.421	70	3.259	1.477	152	3.243	1.471	128	2.901	1.592	-0.194		-0.179		0.163	
ROA	351	0.054	0.080	49	0.071	0.068	92	0.041	0.102	93	0.047	0.099	-0.017		0.012		0.007	
OROA	425	0.110	0.080	74	0.116	0.072	158	0.113	0.078	131	0.111	0.078	-0.006		-0.003		-0.001	
Tobin's Q	419	1.632	1.000	73	1.598	0.693	151	1.748	1.194	128	1.743	1.267	0.034		-0.116		-0.111	
Working capital growth	371	-0.291	2.530	65	0.174	1.685	146	-0.101	1.627	113	-0.118	1.707	-0.465		-0.190		-0.173	
Short debt change	426	-0.070	1.993	74	0.000	0.951	158	0.109	1.172	132	0.124	1.018	-0.070		-0.179		-0.194	
Advertising	427	0.008	0.019	74	0.014	0.030	159	0.016	0.033	132	0.017	0.034	-0.006	**	-0.008	***	-0.009	***
Research	427	0.028	0.056	74	0.018	0.038	159	0.024	0.052	132	0.024	0.051	0.010		0.004		0.004	
Firm age	428	53.439	46.681	74	61.311	35.766	159	51.264	48.129	132	46.727	38.115	-7.872		2.175		6.712	
Return volatility	418	0.098	0.065	73	0.091	0.030	150	0.102	0.039	127	0.104	0.035	0.007		-0.004		-0.006	
Alpha	320	0.004	0.023	49	0.009	0.021	77	0.008	0.020	83	0.009	0.023	-0,005		-0.004		-0.005	*
Ln cash	418	6.498	1.601	73	6.196	1.487	156	6.364	1.644	128	6.364	1.494	0.303		0.134		0.134	
Sales/asset	428	0.862	0.702	74	1.027	0.665	159	0.900	0.557	132	0.912	0.637	-0.165	*	-0.038		-0.050	
Expense/asset	346	0.170	0.154	66	0.210	0.186	145	0.188	0.173	116	0.208	0.183	-0.041	*	-0.018		-0.039	**
Cost/asset	428	0.570	0.600	74	0.670	0.574	159	0.560	0.478	132	0.567	0.522	-0.100		0.010		0.002	
Depreciation/asset	414	0.035	0.022	72	0.039	0.023	156	0.036	0.021	125	0.037	0.024	-0.004		-0.001		-0.002	

This table reports means, standard deviations, and tests between means of non-family firms, Heir firms, and Family-owned firms and Leader/owner firms in 2008. Family firms are defined as the sum of all of the four subgroups of firms: (1) founder firms; (2) heir firms; (3) family-owned firms; and (4) Leader/owner firms. Founder firms are firms where the founder/founders of the firm holds/hold a position as a board member, CEO, or a blockholder (has at least a 5 percent share holding). Heir firms are firms where the heir/heirs (by blood or by marriage) of the founder/founders of the firm holds/hold a position either as a board member, CEO, or a blockholder (has at least a 5 percent share holding). Family-owned firms are firms where one individual or several members from the same family together hold more than 10 percent of outstanding shares either directly or indirectly through another family firm or fund which the individual or the family controls or owns. Leader/owner firms are firms where the CEO or a board member is simultaneously a significant shareholder with an outstanding ownership stake of at least 5 percent. Non-family firms are all remaining sample firms that do not fulfill my criteria of family firms. Size is the natural logarithm of the book value of the total assets of a firm. Capital structure is the book value of the total liability (the book value of the total asset – the book value of the equity) divided by the book value of the total equity. Investment is capital expenditure divided by the PPE of the last fiscal year. Ln employee is a natural logarithm of the number of employees in the firm. ROA is net income divided by the book value of the total assets. OROA is earnings before interests and taxes (EBIT) divided by the book values of the total assets. Tobin's Q is the market value of the equity plus the book value of the total liability (the book value of the total asset – the book value of the equity) divided by the book value of the total assets. Working capital growth is the yearly working capital growth rate, defined as an increment of yearly working capital divided by working capital of the last fiscal year. Short debt change is the yearly short-term debt increment, defined as the difference between short-term debt this fiscal year and the last fiscal year, measured in 1 billion US dollars. Advertising is yearly advertising expense divided by sales. Research is yearly research and development expense divided by sales. Firm age is the difference between the incorporation year and a fiscal year. Return volatility is firm idiosyncratic risk, defined as the standard deviation of stock returns for the previous 36 months. Alpha is an annualized average monthly risk-adjusted return of stock. Monthly risk-adjusted return is the difference between the monthly before-expense return and the risk premium, defined as the vector of betas times the vector of Fama and French three factors (1993) realized in month t. I estimate the betas by a rolling regression following Gil-Bazo and Ruiz-Verdu (2009). Ln cash is the natural logarithm of cash. Sales/asset is the ratio of sales to the book value of the total assets. Expense/asset is ratio of selling, general administrative expense to the book value of the total assets. Cost/asset is the ratio of costs of goods to the book value of the total assets. Depreciation/asset is the ratio of depreciation and amortization to the book value of the total assets. The sample comprises 658 firms from S&P 500 (US), FTSE100 (UK), DAX 30 (Germany), CAC 40 (France) and FTSE MIB 40 (Italy) in the 2011 index company lists. Robust standard errors are reported in parentheses. Asterisks denote statistical significance at 10 percent (*), 5 percent (**) and 1 percent level (***) respectively.

Appendix 4 Fixed effect estimation of founder firm outperformance in OROA during the crisis (non-financial firms, US firms, and US-non-financial firms)

	Dependent Variable: OROA		
	Non-financial firms	US firms	US non-financial firms
Crisis_acc	0.009	-0.008	0.011
	(0.022)	(0.025)	(0.033)
Founder*Crisis_acc	0.017 *	0.025 **	0.031 **
	(0.010)	(0.011)	(0.013)
Heir*Crisis_acc	0.003	0.004	0.005
	(0.006)	(0.008)	(0.008)
Family_owned*Crisis_acc	-0.001	0.003	0.001
	(0.007)	(0.008)	(0.008)
Leader_owner*Crisis_acc	-0.009	-0.012	-0.011
	(0.008)	(0.010)	(0.011)
Size	-0.028 ***	-0.036 ***	-0.049 **
	(0.010)	(0.014)	(0.019)
Capital structure	0.000	0.000	-0.001
	(0.001)	(0.001)	(0.001)
Ln employee	0.019 *	0.036 **	0.042 **
	(0.010)	(0.016)	(0.018)
Investment	-0.047	-0.113 ***	-0.097 **
	(0.034)	(0.042)	(0.047)
Advertising	-0.668 **	-0.529	-0.703 **
	(0.323)	(0.356)	(0.350)
Research	0.122	0.091	0.098
	(0.082)	(0.093)	(0.097)
Firm age	0.004 ***	0.008 ***	0.010 ***
	(0.002)	(0.002)	(0.003)
Return volatility	0.186 **	0.493 ***	0.629 ***
	(0.077)	(0.143)	(0.171)
Size*Crisis_acc	-0.003	0.000	-0.002
	(0.003)	(0.003)	(0.004)
Capital structure*Crisis_acc	0.001 *	0.001 *	0.002 *
	(0.001)	(0.001)	(0.001)
Ln employee*Crisis_acc	0.002	-0.002	-0.001
	(0.002)	(0.002)	(0.003)
Investment*Crisis_acc	-0.080 ***	-0.039	-0.034
	(0.030)	(0.035)	(0.038)
Advertising*Crisis_acc	0.255 ***	0.248 ***	0.260 ***
	(0.064)	(0.072)	(0.076)
Research*Crisis_acc	0.098 ***	0.092 **	0.110 **
	(0.037)	(0.043)	(0.046)
Firm age*Crisis_acc	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)
Return volatility*Crisis_acc	-0.114 **	-0.380 ***	-0.484 ***
	(0.048)	(0.134)	(0.142)
_cons	0.112	-0.059	-0.036
	(0.088)	(0.134)	(0.156)
Within R-sq	0.163	0.182	0.206
N	1855	1335	1207

This table reports results of robustness tests of firm fixed effect model regressions of firm performance before and during the financial crisis from 2006 to 2010. The first column represents the results of non-financial firms. The second column represents the results of US firms. The third column represents the results of US non-financial firms. Founder*Crisis_acc, Heir*Crisis_acc, Family_owned*Crisis_acc, and Leader_owner*Crisis_acc are interactions between dummy variable: Founder, Heir, Family_owned, or Leader_owner and dummy variable: Crisis_acc. Crisis_acc is a dummy which is one if the fiscal year is 2009 and 2010. This variable indicates the years when the financial crisis significantly strikes real economy. Founder firms are firms where the founder/founders of the firm holds/hold a position as a board member,CEO, or a blockholder (has at least a 5 percent share holding). Heir firms are firms where the heir/heirs (by blood or by marriage) of the founder/founders of the firm holds/hold a position either as a board member, CEO, or a blockholder (has at least a 5 percent share holding). Family-owned firms are firms where one individual or several members from the same family together hold more than 10 percent of the outstanding shares either directly or indirectly through another family firm or fund which the individual or the family controls or owns. Leader/owner firms are firms where the CEO or a board member is simultaneously a significant shareholder with an outstanding ownership stake of at least 5 percent. OROA is earnings before interests and taxes (EBIT) divided by the book values of the total assets. Capital structure is the book value of the total liability (the book value of the total asset – the book value of the equity) divided by the book value of the total equity. Investment is the capital expenditure divided by the PPE of the last fiscal year. Ln employee is natural logarithm of the number of employees of the firm. Advertising is yearly advertising expense divided by sales. Research is yearly research and development expense divided by sales. Firm age is the difference between the incorporation year and a fiscal year. Return volatility is firm idiosyncratic risk, defined as the standard deviation of stock returns for the previous 36 months. Size*Crisis_acc, Capital Structure*Crisis_acc, Ln employee*Crisis_acc, Investment*Crisis_acc, Advertising*Crisis_acc, Research*Crisis_acc, Firm age*Crisis_acc and Return volatility*Crisis_acc are interactions between Crisis_acc and Size, Capital Structure, Ln employee, Investment, Advertising, Research, Firm age and Return volatility respectively. The sample comprises 542 non-financial firms from S&P 500 (US), FTSE100 (UK), DAX 30 (Germany), CAC 40 (France) and FTSE MIB 40 (Italy) in the 2011 index company lists. Robust standard errors are reported in parentheses. Asterisks denote statistical significance at 10 percent (*), 5 percent (**) and 1 percent level (***) respectively.

Appendix 5 Fixed effect estimation of OROA, Tobin's Q and Alpha (US firms present in the S&P 500 list in each year during the period of 2006-2010)

	Dependent Variable											
	OROA				Tobin's Q				Alpha			
Crisis_acc	-0.025		-0.021		Crisis_mkt	-0.633		-0.412	***	0.097	***	0.029	***
	(0.031)		(0.030)			(0.673)		(0.094)		(0.026)		(0.004)	
Family*Crisis_acc	0.009				Family*Crisis_mkt	-0.098				0.000			
	(0.006)					(0.120)				(0.005)			
Founder*Crisis_acc			0.029	**	Founder*Crisis_mkt			-0.016				0.003	
			(0.013)					(0.119)				(0.009)	
Heir*Crisis_acc			0.010		Heir*Crisis_mkt			0.204				0.005	
			(0.008)					(0.170)				(0.011)	
Family_owned*Crisis_acc			-0.002		Family_owned*Crisis_mkt			0.121				0.001	
			(0.008)					(0.197)				(0.010)	
Leader_owner*Crisis_acc			-0.015		leader_owner*Crisis_mkt			-0.317	*			-0.013	
			(0.012)					(0.171)				(0.012)	
Size	-0.052	**	-0.052	***	Size	-0.258	*	-0.114		-0.003		-0.003	
	(0.020)		(0.019)			(0.143)		(0.112)		(0.010)		(0.010)	
Capital structure	0.000		-0.001		Capital structure	0.000		0.007	**	0.005	***	0.000	
	(0.001)		(0.001)			(0.069)		(0.003)		(0.002)		(0.000)	
Ln employee	0.016		0.014		Ln employee	0.066		-0.120		-0.002		-0.006	
	(0.018)		(0.017)			(0.120)		(0.110)		(0.011)		(0.009)	
Investment	-0.149	***	-0.135	***	Investment	-0.713		-1.198	**	-0.001		-0.013	
	(0.053)		(0.049)			(0.962)		(0.572)		(0.044)		(0.025)	
Advertising	-0.651	*	-0.699		Advertising	2.416		4.060		0.608	**	0.530	**
	(0.342)		(0.349)			(4.405)		(3.430)		(0.276)		(0.235)	
Research	0.057		0.091		Research	2.943	*	1.260		-0.099	*	-0.053	
	(0.087)		(0.093)			(1.714)		(1.408)		(0.056)		(0.054)	
Firm age	0.009	***	0.009	***	Firm age	0.054	**	0.029		-0.005	***	-0.009	***
	(0.003)		(0.003)			(0.021)		(0.022)		(0.001)		(0.002)	
Return volatility	0.437	**	0.457	**	Return volatility	4.044		-4.480	***	0.365	**	-0.040	
	(0.183)		(0.184)			(3.315)		(1.046)		(0.161)		(0.099)	
Size*Crisis_acc	0.001		0.001		Size*Crisis_mkt	0.112		-0.042	***	-0.006	*	0.000	
	(0.003)		(0.003)			(0.078)		(0.010)		(0.004)		(0.001)	
Capital structure*Crisis_acc	0.001		0.001		Capital structure*Crisis_mkt	0.001		-0.008	**	-0.005	**	0.000	
	(0.001)		(0.001)			(0.069)		(0.004)		(0.002)		(0.001)	
Ln employee*Crisis_acc	-0.001		0.000		Ln employee*Crisis_mkt	-0.089	*	0.034	*	0.004		0.000	
	(0.003)		(0.003)			(0.048)		(0.020)		(0.003)		(0.001)	
Investment*Crisis_acc	-0.045		-0.056		Investment*Crisis_mkt	-0.610		0.295		0.005		0.028	
	(0.038)		(0.037)			(0.959)		(0.438)		(0.041)		(0.024)	
Advertising*Crisis_acc	0.113		0.149	**	Advertising*Crisis_mkt	2.380		1.348	**	-0.071		-0.049	
	(0.075)		(0.075)			(1.950)		(0.647)		(0.090)		(0.057)	
Research*Crisis_acc	0.097	**	0.089	*	Research*Crisis_mkt	-2.290	*	-1.002	**	0.031		-0.038	
	(0.049)		(0.052)			(1.208)		(0.491)		(0.045)		(0.026)	
Firm age*Crisis_acc	0.000		0.000		Firm age*Crisis_mkt	-0.002		0.000		0.000	**	0.000	
	(0.000)		(0.000)			(0.001)		(0.000)		(0.000)		(0.000)	
Return volatility*Crisis_acc	-0.327	*	-0.353	**	Return volatility*Crisis_mkt	-3.468		5.058	***	-0.237		0.136	*
	(0.176)		(0.176)			(3.240)		(0.963)		(0.153)		(0.080)	
_cons	0.093		0.094		_cons	1.015		2.310		0.235	***	0.496	***
	(0.169)		(0.165)			(1.884)		(1.705)		(0.073)		(0.113)	
Within R-sq	0.193		0.205		Within R-sq	0.196		0.249		0.086		0.107	
N	1037		1037		N	1037		1037		1016		1016	

This table reports results of firm fixed effect model regressions of firm performance before and during the financial crisis from 2006 to 2010. Family*Crisis_acc (Family*Crisis_mkt), Founder*Crisis_acc (Founder*Crisis_mkt), Heir*Crisis_acc (Heir*Crisis_mkt), Family_owned*Crisis_acc (Family_owned*Crisis_mkt) and Leader_owner*Crisis_acc (Leader_owner*Crisis_mkt) are interactions between dummy variable: Family, Founder, Heir, Family_owned, or Leader_owner and dummy variable: Crisis_acc (Crisis_mkt). Crisis_acc is a dummy which is one if the fiscal year is 2009 and 2010. This variable indicates the years when the financial crisis significantly strikes real economy. Crisis_mkt is a dummy which is one if fiscal year is 2008, 2009 and 2010. This variable indicates the years when the financial crisis significantly strikes the financial market. Founder is a dummy which equals one if a firm is a founder firm. Family is a dummy variable, which is one if the sample firm is a family firm. Family firms are the sum of all the four subgroups of firms: (1) founder firms; (2) heir firms; (3) family-owned firms; and (4) Leader/owner firms. Founder firms are firms where the founder/founders of the firm holds/hold a position as a board member,CEO, or a blockholder (has at least a 5 percent share holding). Heir firms are firms where the heir/heirs (by blood or by marriage) of the founder/founders of the firm holds/hold a position either as a board member, CEO, or a blockholder (has at least a 5 percent share holding). Family-owned firms are firms where one individual or several members from the same family together hold more than 10 percent of the outstanding shares either directly or indirectly through another family firm or fund which the individual or the family controls or owns. Leader/owner firms are firms where the CEO or a board member is simultaneously a significant shareholder with an outstanding ownership stake of at least 5 percent. OROA is the earnings before interests and taxes (EBIT) divided by the book values of the total assets. Tobin's Q is the market value of the equity plus the book value of the total liability (the book value of the total asset – the book value of the equity) divided by the book value of the total assets. Alpha is annualized average monthly risk-adjusted return of stock. Monthly risk-adjusted return is the difference between monthly before-expense return and risk premium, defined as the vector of betas times the vector of Fama and French three factors (1993) realized in month t. I estimate the betas by a rolling regression following Gil-Bazo and Ruiz-Verdu (2009). Size is the natural logarithm of the book value of the total assets of a firm. Capital structure is the book value of the total liability (the book value of the total asset – the book value of the equity) divided by the book value of the total equity. Investment is the capital expenditure divided by the PPE of last fiscal year. Ln employee is natural logarithm of the number of employees of the firm. Advertising is yearly advertising expense divided by sales. Research is yearly research and development expense divided by sales. Firm age is the difference between the incorporation year and a fiscal year. Return volatility is firm idiosyncratic risk, defined as the standard deviation of stock returns for the previous 36 months. Size*Crisis_mkt (Size*Crisis_acc), Capital Structure*Crisis_mkt(CapitalStructure*Crisis_acc),Lnemployee*Crisis_mkt(Lnemployee*Crisis_acc),Investment*Crisis_mkt(Investment*Crisis_acc),Advertising*Crisis_mkt(Advertising*Crisis_acc),Research*Crisis_mkt(Research*Crisis_acc), Firm age*Crisis_mkt (Firm age*Crisis_acc) and Return volatility*Crisis_mkt (Return volatility*Crisis_acc) are interactions between Crisis_mkt (Crisis_acc) and Size, Capital Structure, Ln employee, Investment, Advertising, Research, Firm age and Return volatility respectively. The sample only comprises 370 US firms from S&P 500 list. These firms must stand on the list in each year from 2006 to 2010. Robust standard errors are reported in parentheses. Asterisks denote statistical significance at 10 percent (*), 5 percent (**) and 1 percent level (***) respectively.

CEO Divorce and Firm Performance

Haoyong Zhou*

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Abstract

This paper provides the first empirical evidence showing that divorce has a significant effect on the economic outcome of an organization, in addition to its widely-documented impact on individuals. Using an informative dataset which covers almost all Danish private firms and CEO personal and family information (like CEO's marriage history), I evaluate the economic consequence of CEO divorce on the firm he helms. The results show that firms subsequently underperform after CEO divorces, both relative to previous performance and relative to non-divorce firms. The negative effect of divorce is consistent whether I adopt all non-divorce firms or matched non-divorce firms as control. My empirical results further suggest that marital conflict between the divorcing couple serves as one channel through which divorce strikes firm performance.

JEL classifications: G30; G34; G38; K22

Key words: CEO, divorce, family firms, firm performance

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* PhD candidate, Department of Economics, Copenhagen Business School. Address: Porcelænshaven 16 A, 2000 Frederiksberg, Denmark. E-mail: hz.eco@cbs.dk

1 Introduction

Does CEO divorce affect firm performance? If so, why is that? Through which channel(s) does CEO divorce affect corporate performance? While numerous papers (for instance, Peterson, 1996; Gupta *et al.,* 1999; Piketty, 2003) focus on the impact of divorce on *individual* economic status and well-being (men, women and children),congesting economic and sociological literature, scant research touches upon the economic consequence of divorce at a broader *organizational* level. This paper aims to fill the gap by investigating economic influence of CEO divorce on firm performance. Analysis of CEO divorce is particularly interesting as CEOs are often the most powerful and visible individuals, who most likely affect firm performance.

Over the last several decades, industrial countries have experienced an increase in divorce rates. The OECD (2010) reports that during the period from 1970 to 2007, divorce rates rose in almost all OECD countries, except for Estonia and Latvia where initial divorce rates were high in 1970. In Europe, for instance, divorce rates of all countries were less than 2.5 divorces per 1,000 married people in 1960, with many countries experiencing a ratio below 1. The divorce rates of most countries, however, climb to some 5 per 1,000 married people by 2002 (Gonzalez and Vittanen, 2006).

[Insert Figure 1]

The rise in divorce rates has drawn increasing attentions from both researchers and policy makers. Extant literature, however, only concentrates on the consequences of divorce at an individual level. Yet the investigation of divorce impact is scant at the organizational level. Little access to private data like divorce records of top business leaders might be the reason for shortage of this type of research. Nevertheless, using a rare dataset covering almost all Danish

private firms and CEO personal and family information (like CEO marriage history), this paper contributes to existing literature by analyzing economic consequence of CEO divorce.

In this article, I pose two research questions. The primary concern is to explore whether CEO divorce has a significant effect on ex-post firm performance.

Divorce comprises a dramatic transformation from an intimate, usually harmonious relationship into an antagonistic, often painful one (Hopper, 2001). Therefore, divorce may inflict costs on firms through the following channels: first, marital status shift varies CEO's time allocation (for example, children-rearing takes more personal time than in marriage) between household and productive activities (Becker, 1965), which is likely to hurt firm performance. Second, spousal goodwill is lost after divorce (e.g. Poza and Messer, 2001). Mental stress increases, leading to work inefficiency and errors. Third, in the context of family firms, costs arise in extra ways: (1) Partnership synergies disappear when the couple breaks up and the two families behind the marriage cut off the business relationship; (2) Personal economic status drop may result in firm credit constraint and further underinvestment, given limited finance instruments for small family firms and ambiguous division of personal wealth and firm fund; and (3) Divorce entails marital conflict, which I interpret as difference in interests due to divergent commitments to the same firm given one party will soon leave the business, and related non-cooperation or antagonism between divorcing couple in terms of firm operation. Marital conflict may bring about high cost when both husband and wife are simultaneously top managers or board members.

However, the cost of CEO divorce imposed on a firm is less definitive. "Divorce is a leap in the dark." [1] Proxying for psychological well-being with General Health Quality and life satisfactory scores, Gardner and Osward (2005) show that couples become happier when their

[1] Refer to the abstract of "Do divorcing couples become happier by breaking up?" Gardner and Osward ,2005.

marriages come to an end. Men and women reap happiness from divorce equally. It is reasonable to assume that mental happiness can enhance working efficiency and spur inspirations. In this sense, divorces may rescue CEOs from a bitter marriage, benefiting ex-post firm performance. Thus, the influence of CEO divorce on performance of the firm he leads remains an empirical question.

A leading challenge of treatment (divorce in the context) analysis is to find a credible counterfactual, given the endogeneity of divorce. CEO divorces are not randomly assigned to the sample firms. Divorce CEOs and firms might be unobservably different from non-divorce ones. If I compare performance change before and after the divorce years of divorce firms with that of all non-divorce firms, the estimation will suffer from selection bias. I adopt several empirical methods to tackle this issue. The main identification strategy is to construct a reliable counterfactual using nearest neighbor Propensity Score (PS) matching estimator similar to the approach by Rosenbaum and Rubin (1983), Abadie and Imbens (2007) and Malmendier and Tate (2009). The big sample size and substantial overlap across divorce and non-divorce firms fulfill the preconditions (Shadish, Cook, and Campbell, 2002) of the PS matching estimator. I first run a probit regression to predict divorce based on a bunch of matching variables measuring CEO, CEO family and firm characteristics at the time of pre-treatment year (one year prior to the divorce calendar year). Next, I obtain a sample of matched non-divorce firms by matching each divorce firm to a non-divorce firm, which has the closest predicted likelihood of divorce (propensity score) to the actual divorce firm. A concern arises regarding heterogeneity not fully captured by observable covariates. The remaining heterogeneity across divorce firms and matched non-divorce firms will bias our estimation if it is orthogonal to observable covariates. Following Malmendier and Tate (2009), I minimize this bias by verifying that the matched

sample and the divorce sample are undifferentiated with respect to almost all observable covariates, including all the covariates which are not the matching variables and the interactions of major matching variables.

I find that firms subsequently underperform after the CEO divorces, both relative to previous performances and relative to non-divorce firms. The findings are consistent whether I adopt all non-divorce firms or matched non-divorce firms as control. CEO divorce firms underperform no-event-counterparts during the same period by 3.4 percent of industry-adjusted Operating Return on Assets (OROA). Thus, CEO divorce has a negative effect on firm performance.

Next, I try to explore the mechanism through which CEO divorce hits firm performance. I assume that marital conflict prevails in each divorcing couple around the divorce year and investigate whether marital conflict diminishes firm performance. I approach the task by examining the impact of joint-management (both of the divorcing couple are top managers/board members) on OROA during the divorce period (5 consecutive year window centered by the divorce year). The results of fixed effect model provide evidence of the cost of marital conflict. An alternative interpretation of this finding is asset expropriation or rent seeking from a self-interested spouse board member in a shortly-cracked partnership.

Credit constraint may also serve as a second channel through which divorce strikes corporate performance given the ambiguousness of personal fund and firm fund in family firms. However, difference in difference test around the divorce year fails to find significant difference in short term debt and capital structure variation between divorce firms and matched non-divorce firms.

The remainder of the paper is structured as follows: first, in Section 2, I present a review of related literature. Second, I describe the dataset in Section 3. Third, in Section 4, I discuss about

our empirical strategy. Fourth, I show our empirical findings in Sections 5. A discussion of policy implication of the findings concerning unilateral divorce laws and Corporate Governance codes is given in Section 6. Finally I conclude.

2 Divorce consequence, CEO value and family events and firm performance

It is the rise in divorce rates around the world that receives more attentions from academics in various fields. Some inquire into the reasons of rise of divorce rates and ascribe it to the liberalization of divorce laws, that is, no-fault unilateral divorce. They argue that introduction of unilateral divorce reduces costs of divorce because mutual consent is no longer compulsory (c.f. Fredberg, 1998; Wolfers, 2006, Gonzalez and Vittanen, 2006).

More attempts, however, are to scrutinize consequences of divorce *per se* and softening of divorce law. On one hand, for example, Peterson (2002) uses 1977-1978 Los Angeles sample and documents that divorced women's economic status drops by 27 percent, while men's by 10 percent. Using mother-child data from the National Longitudinal Survey of Youth (NLSY), Jo Cioro *et al.* (1999) evidence that divorce and separation are related to increases in children's behavioral problems, without regard to the level of conflict between parents.

On the other hand, Stevensen and Wolfers (2006) show that introduction of unilateral divorce engenders a 8–16 percent decline in female suicide, roughly a 30 percent decline in domestic violence for both men and women, and a 10 percent decline in female homicides by her partners. Stevensen (2007) finds that adoption of unilateral divorce, despite the prevalent division of property law, induces underinvestment in almost all types of marriage-specific capital considered except ownership of house.

Both economists and sociologists, however, channel all their researches into impact of divorce on individual (men, women and children) economic status or well-being. Studies into the consequence of divorce in a broader range like an organization are still missing. The main contribution of the paper is to supply this knowledge lack by focusing on a special group of people, CEOs of firms, the pivotal leaders of business. Using an informative Danish closely-held private firm dataset with CEO personal and family tree data, I aim to evidence the relationship between CEO divorce and performance of the firm the CEO helms.

CEOs matter to firm operation and decision-making. Performing an event study, Weisbach (1988) and Bonnier and Bruner (1989) document significantly positive stock price reaction to CEO turnover decision. Bennedsen, Nielsen, Pérez-González and Wolfenzon (2008) show that CEOs' own death and bereavement are strongly correlated to declines in firm profitability. More recently, Malmendier and Tate (2009) report that after CEOs win major awards, the firms' market and accounting performance decrease, especially for those firms with weak Corporate Governance. I supplement this strand of research from a novel perspective, consequence of CEO's marital status shift on firm performance, testifying CEO value to firms.

The value of CEOs is more significant in family firms, where family and business are intertwined (Lansberg, 1988; Shama, 2004) and family business heavily relies on top leaders like CEOs. It is the characteristics, events and interactions of multi-stakeholders of controlling family behind the family firm that have a profound influence on decision-making and other outcome of family firms by means of ownership structure, management and governance (Astrachan, Klien, and Smyrnios, 2002). Pérez-González (2006) and Bennedsen, Nielsen, Pérez-González and Wolfenzon (2007) identify a causal effect of family succession on deterioration of firm performance, criticizing nepotism in family firms. By contrast, Mehrotra, Morck, Shim and

Wiwattanakantang (2010) show that Japanese inherited family firms outperform non-family firms and adopted heir's firms perform best. Villalonga and Amit (2006) find that family ownership adds value only when the founder serves as CEO or as Chairman of board. Disproportionate voting right reduces the founder's premium. Bertrand, Johnson, Samphantharak, and Schoar (2008) document that in Thailand greater family involvement in ownership and board membership by founders' sons is negatively associated with firm performance. Again in Thailand, financial market reacts positively to the marriage of a family member from a family firm if the partner comes from another family with political or business influence (Bunkanwanicha, Fan and Wiwattanakantang, 2010). Because domination of family firms features as one of the characteristics of Danish economy[2] (Bennedsen and Neilsen, 2010), Denmark provides an ideal research environment, given its high divorce rate, of examining the effect of CEO divorce on family firm performance. Employing a rich dataset covering almost all Danish private firms, I provide new evidence to the significant relationship between incidents of controlling family (like a family member's divorce) and outcomes of family firms.

Finally, this paper contributes to literature of Corporate Governance with regard to board study. Adams and Ferreira (2009) argue that female board members mitigate the attendance problem of male board members. Gender diversity, however, has a negative effect on firm performance on average. They suggest that adoption of gender quotas for directors can diminish firm value with good governance. The results of this paper are consistent with their argument of board gender diversity to some extent. I suggest that couple presence at the corporate board have

[2] In our setting, we follow Ampenberger, Bennedsen and Zhou (2011), defining family firms as firms with one or several members from the same family together hold more than 10 percent of outstanding shares, or firms in which the CEO is simultaneously a significant shareholder with an outstanding ownership stake of at least 5 percent. We find that family firms account for 92.33 percent of the sample.

the chance of imposing potential costs on firm performance and it may not be the optimal arrangement.

3 Data source and sampling criteria

This research employs a rare and informative Danish dataset, which covers almost all the active private and public firms in Denmark, reporting various accounting information of these firms along with details of controlling family and family members who are in top managers, board members and owners of the firms from 1994 to 2006. The main body of the dataset consists of three data sources:

a. Købmandsstandens Oplysningsbureau (KOB): This dataset covers accounting and ownership information of all registered limited liability firms in Denmark. The dataset is based on annual reports which all Danish companies with limited liability are required to file with the Ministry of Economics and Business Affairs. The data includes accounting data, information on the composition of the management board and basic ownership structures. Despite the nature of being privately held, the accounting statistics in KOB are reliable in that they originate from annual reports, which should be, regulated in Danish company law, audited and approved by external accountants.

b. *Erhvervs-og Selskab-sstyrelsen* (E&S): Another significant source of information tapping the top managerial echelon of firms derives from the dataset administrated by agency *Erhvervs-og Selskab-sstyrelsen* (The Danish Commerce and Companies Agency), at the Ministry of

Economics and Business Affairs. This strand of information includes all the names of historical top managers (CEOs), members of directorates (both managerial and supervisory boards). As is stipulated in Danish Company Law, firms are required to file any variations concerning CEOs and board members within two weeks with the Ministry of Economics and Business Affairs, which ensure us to clarify all the managerial transitions together with verified tenures. What needs to be emphasized is that the dataset contains the CPR number, similar to the Social Security Number in the United States of America, a unique citizen identity number, carrying information of personal birthday and gender, which poses a pivotal role in identifying the relationships of CEOs and the other board members, and merging datasets.

c. *The official Danish Civil Registration System*: The third database, administrated by the Ministry of Interior, supplies us with detailed information about kinship and family ties within the Danish population. Using unique CPR numbers I am able to identify the CEOs' marriage and divorce history, including event time and duration, and the other family characteristics information I need in our empirical studies. For instance, I can identify whether a CEO and his/her divorced spouse are simultaneously present in the board.

By unambiguous CPR numbers, I merge E&S dataset with Danish Civil Registration dataset and get CEOs' personal and family information. Next I link the firm with CEO information to its accounting data in KOB dataset through firm identity numbers, which coexist in both datasets. Taking into account plausible different impact of CEO's 1st divorce and subsequent divorce(s), I only focus on the 1st time divorce. Firms experiencing CEO transitions are excluded. Finally, I end up with 244 CEO divorce firms with full information for a 5 consecutive year window centered by the divorce year. Firms with CEO turnovers and other family events (like

bereavements) are excluded. Appendix 1 gives us a picture of sample size distribution of divorce and all non-divorce firms.

4 Identification strategy

The primary objective of this paper is to investigate the economic effect of CEO divorce on the firm's ex-post performance after the divorce year. An ideal experimental framework would be to compare the actual performance change of CEO divorce firms with performance change of the same firms had the divorce not happened. The counterfactual, nevertheless, cannot be observed. I therefore need to find a proxy for hypothetical firm performance without divorce. A simple departure point is a difference in difference (DID) analysis, comparing ex-post performance of divorce firms with that of non-divorce firms in the same calendar year. The fundamental model is as follows:

$$y_i = a_1 + X_i^{'} b_1 + c_1 divorce_i + \varepsilon_1 \tag{1}$$

Where: y_i is difference in industry-adjusted Operating Return on Assets (OROA), which is two-year mean after divorce year minus two-year mean before divorce year; $divorce_i$ is a dummy variable equal to one if the CEO of a firm gets divorced and zero otherwise and c_1 is the coefficient of interest; X_i are a k*1 vector of control variables.

Operating Return on Assets is regarded as a natural measure of firm performance because it acts as a comprehensive proxy for a firm's earnings before interest and taxes (EBIT) relative to its book asset, the earning generator (Bennedsen et al., 2007). Unlike net income-based measure

like Return on Assets (ROA), it is unaffected by the variation of capital structure, which determines corporate tax base. Unlike return on equity (ROE), it captures total assets rather than part of it. I use industry-adjusted OROA as our primary measure of performance, while other measures like industry-adjusted ROA are also employed for robustness test.

DID approach will reach a valid estimator if the treatment (divorce here) is randomly assigned to the sample firms. In other words, treatment should be exogenous. This assumption, however, is highly challenging. Descriptive statistics in Table 1 show that CEO divorce firms differ dramatically from non-divorce firms in almost all the CEO personal and family characteristics. Except CEO gender, all the other variables are significantly different between CEO divorce firms and non-divorce firms at 1 percent level, and first marriage age is significantly different at 5 percent level. Divorced CEOs are characterized by late marriages, longer working years, lower divorce ages, bigger age difference of the couples, and higher probabilities of parental divorces and joint-management with their spouse in the boards. In addition, divorce firms are significantly different from non-divorce firms in short term debt and fixed asset at 10 percent level. In regard to region and industry distributions, divorce firms are overrepresented in capital region of Denmark and in the industry of wholesale, retail, hotels and restaurants[3]. Economically, these differences imply that divorce firms are selected. Therefore, if I employ all the non-divorce firms as control group, I am unable to indentify an unbiased and consistent estimator, given underlying determinants of selection are correlated to outcome performances. Because most of our sample firms are family firms, intertwinement of family and business indicates that some unobservable family level characteristics are most likely to sway family firm performance. Those characteristics, at the same time, might determine CEO divorce.

[3] Here we use 2-digit Danish Industrial Classification to identify 8 industries.

Following Rosenbaum and Rubin (1983), Abadie and Imbens (2007) and Malmendier and Tate (2009), I use a nearest-neighbor propensity score (PS) matching estimator to construct a matched control group to tackle the selection bias. PS matching estimator pairs treatment and control units that are similar in terms of pre-treatment observable covariates. If all the relevant heterogeneity across treatment and matched groups are captured by these observable covariates, which implies outcomes are viewed as independent of assignment of treatment conditional on pre-treatment covariates, PS matching will provide a valid estimator (Dehejia and Wahba, 2002).

Shadish, Cook, and Campbell (2002) argue that a good PS matching estimator should have several preconditions. Firstly, a large sample is required for locating similar pairs. Secondly, there must be a substantial overlap between treatment and control. These preconditions hold in our setting. On one hand, I have around 11,000 control firms from which only 244 treatment firms need to be matched. On the other hand, similarities in many firm level characteristics between divorce and non-divorce firms in Table 1 make substantial overlap possible. The result of matched sample characteristics again proves this point. In short, the rich dataset legitimates the use of PS matching estimator.

One concern arises regarding heterogeneity not fully captured by observable covariates. The remaining heterogeneity will bias the estimator if it is orthogonal to observable covariates. Following Malmendier and Tate (2009), I minimize this bias by ensuring that there are no differences of observable covariates, including all the covariates which are not matching variables and interactions of major matching variables. I will elaborate on this point below in descriptive statistics interpretation.

[Insert Table 1]

I set up a matched control group as follows: first, for each divorce calendar year, I run a probit regression to predict divorce firms based on matching variables of pre-divorce year (one year prior to the divorce calendar year). Specifically, in 2000, for instance, the sample consists of all the firms, both divorce and non-divorce firms. I assign one to a firm which experiences a CEO divorce in 2000 and zero to those which do not. I further regress divorce dummy on the matching variables in 1999 (one year prior to the divorce calendar year). The matching variables I select are: CEO first marriage age, CEO gender, CEO age, firm size (natural logarithm of total assets), debt ratio (the ratio of book debt to total asset), profitability (industry-adjusted OROA last year), industry dummy and region dummy. Psychological and sociological literature documents the correlation between early marriage age and divorce risk over the years[4] (e.g. Kiernan and Mueller, 1998; Larsen and Tilson, 2000). Wilson (2008) reports that professional women outnumber men in failing personal relationships. Age is widely used by literature as a predictor of divorce and CEO age is significantly different between divorce and non-divorce firms in the sample. I, therefore, use first marriage age of CEO, CEO gender and age as the main predictors of CEO divorce. Additionally, I involve firm size, debt ratio, industry dummy and region dummy in the matching variable list to ensure that divorce firms and matched non-divorce firms are indistinguishable before CEO divorce. To control for ex-ante difference, I also include profitability, the lagged industry-adjusted OROA as a matching variable. In brief, by combining two groups of matching variables, I aim to minimize heterogeneity across divorce firms and non-divorce firms in terms of CEO personal and family characteristics and firm characteristics.

[Insert Table 2]

[4] Their findings differ from our observations in Table 1. However, we still include this variable as a predictor of divorce.

Table 2 presents the results of this probit regression for year 2003[5]. The coefficient estimates confirm the predictive power of CEO age. Younger CEOs are significantly more likely to get divorced, even controlling for firm characteristics. The other CEO characteristics (gender and first marriage age) and firm characteristics, however, do not have significant predictive power.

Second, I use the predicted values of probit regression, that is, propensity scores, to construct a matched non-divorce control sample for the divorce firms. For each divorce firm, without replacement[6], I select one non-divorce firm with the propensity score closest (nearest neighbor) to the divorce firm. Using propensity scores rather than direct matching variables enables us to mitigate the problem of dimensionality of matching (Malmendier and Tate, 2009) and obtain a matched control group with the highest ex-ante similarity to divorce firms in firm and CEO characteristics.

Last, I combine the matched firms of each year into a group of all matched non-divorce firms across all the divorce calendar years. In doing so, I end up with a sample consisting of 244 divorce firms and their 244 most similar non-divorce counterparts.

Table 1 reports descriptive statistics of three groups: all non-divorce firms, matched non-divorce firms, and divorce firms in all divorce years. Besides average values, I include medians and standard deviations for each variable in the 2nd and 3rd column of each category in Panel A. I also test the statistical differences in the last two columns of the table. In contrast to all non-divorce firms, which are significantly different from divorce firms in multi-dimensions, matched sample is highly similar to divorce firms. Among all the major matching variables, none of them

[5] Since I perform the PS matching year by year, I only present the results for year 2003, when I have the biggest number of observations.

[6] There is a tradeoff between quality and precision when we choose with replacement or without replacement. If we apply with replacement, the average matching quality will increase. But simultaneously fewer control firms are used, reducing the precision. I apply without replacement here because the treatment sample is small and the control sample is big enough to enable me to get good matching quality without replacing the used control firms. In the section of Robustness tests, I apply with replacement using the same matching variables. The results are consistent with those in the case of without replacement.

is significantly different between divorce firms and matched non-divorce firms. Furthermore, there are also no significant differences in industry and region distributions after matching (please refer to Panel B).

I rely on additional tests to examine the quality of matching and minimize remaining heterogeneity. First, I test the differences of all the other observable covariates, which are not matching variables, between matched non-divorce firms and divorce firms. None but joint-management is significantly different at 1 percent level. In the case of joint-management, however, medians are the same in both divorce firms and matched non-divorce firms. Second, following Malmendier and Tate (2009), I perform a t-test of pair interactions across matched non-divorce firms and divorce firms. If interactions of two major matching variables can predict divorce and performance, excluding them from matching strategy will lead to bias. Appendix 2 reveals all 15 interactions difference test. No one is significantly different at 10 percent level.

In summary, applying all non-divorce firms as control engenders selective bias when investigating the ex-post effect of CEO divorce on firm performance. To cope with this problem, I utilize a nearest-neighbor propensity score matching estimator and construct a matched non-divorce control sample. After matching, almost all the observable dimensions are similar across divorce firms and matched non-divorce firms, by contrast to the case of all non-divorce firms. Extra tests are applied to the minimization of remaining heterogeneity.

5 Empirical results

The principal objective of this paper is to examine the ex-post impact of CEO divorce on firm performance and investigate the channel of this impact. I have elaborated on the main econometric strategy, that is, nearest-neighbor propensity score matching estimator, and further check matching quality. In the following section, I will show the empirical results.

5.1 The negative effect of CEO divorce on firm performance

I begin with a univariate difference in difference analysis of OROA, ROA, industry-adjusted OROA and industry-adjusted ROA. Again, I list the 4 performance indicators of all non-divorce firms, matched non-divorce firms and divorce firms side by side around divorce calendar year in Table 3.

[Insert Table 3]

My first step focuses on comparison between all non-divorce firms and divorce firms. Three points need to be emphasized. First of all, I notice that before divorce calendar year, ROA and OROA of divorce firms are similar to those of non-divorce firms without significant differences at 10 percent level. After divorce calendar year, however, ROA and OROA of non-divorce firms are significantly higher than divorce firms by 1.7 and 1.8 percent respectively. Secondly, OROA and ROA of divorce firms drop while those of all non-divorce firms increase after the same divorce calendar years. The performance differences around divorce calendar year of ROA and OROA are significantly different between divorce and non-divorce at 5 percent level. Thirdly, industry-adjusted performance variations across the same divorce calendar year for the two groups differ significantly. Divorce firms decrease much more dramatically than non-divorce

firms (for example, difference in industry-adjusted OROA of divorce firms is -.0031 versus -0.01 of non-divorce firms, which means that divorce firms experience a performance drop 3.1 times as high as non-divorce firms).

Next, I center on the comparison between matched non-divorce firms and divorce firms, which is free from selection bias. What strikes us is that none of the 4 measures of performance (ROA, OROA industry-adjusted ROA and industry-adjusted OROA) drops for matched non-divorce firms. All the performance measures before and after divorce year are not significantly different at 10 percent level. This means that matched non-divorce firms, during the same 5 year period as divorce firms, maintain a stable and consistent profitability. By contrast, divorce firms' performance slides sharply, although before divorce years, they are the most similar counterparts to matched sample. Differences in performance increments across divorce year between divorce firms and matched non-divorce firms are highly significant with at least 5 percent level. More importantly, all difference magnitudes increase relative to the case of comparing divorce firms with all non-divorce firms. Difference in difference in industry-adjusted OROA before and after divorce year, for example, grows from 2.1 percent to 3.7 percent. The growth rate is 76 percent. Besides, after divorce industry-adjusted performance measures (industry-adjusted ROA and industry-adjusted OROA) are now significantly different at 10 percent level between divorce firms and matched non-divorce firms, whereas they are not when I use all non-divorce firms as control group. Difference expansion and significance increase imply the selection bias. Using all non-divorce firms as control underestimates the negative effect of CEO divorce.

The deterioration impact of divorce on performance can be consolidated by the pattern in Figure 2, where I plot the evolutions of average values of industry-adjusted ROA and industry-adjusted OROA around divorce years in the case of all non-divorce firms, matched non-divorce

firms and divorce firms respectively. Whereas non-divorce firms' mean performance falls slightly and smoothly along divorce window, matched non-divorce firms, despite a small shock in divorce year, keep an identical profitability to the level before divorce year. As a whole, non-divorce firms, either matched sample or all, hold a preserving pattern. Divorce firms, however, follow a decidedly disparate trajectory. Industry-adjusted OROA and ROA both slump during the 5 year period.

[Insert Figure 2]

After univariate and graphical analyses, I turn to fundamental econometric model (1) for more precise estimation of the negative effect of CEO divorce. Table 4 reveals Ordinary Least Square (OLS) results of model (1). Again I classify the results into two categories. One is for the case where all non-divorce firms are control sample and the other matched non-divorce firms. In the first case, I control for CEO gender, CEO age, CEO couple Joint-management status, firm size, capital structure, profitability at the time of divorce. I also include year dummy for controlling for macroeconomic factors. As for the second case, I exclude the controls of CEO gender and age, which, after matching, have fewer variations.

The table shows that regardless of change in control variable and control group, the coefficient of dummy divorce is consistently significantly different from zero across all the specifications at 5 percent level. The negative value demonstrates that divorce firms do underperform non-divorce firms after the CEO suffers from divorce. The results are robust whether I choose all non-divorce firms or matched non-divorce firms as control.

[Insert Table 4]

With respect to the magnitude of coefficients, the results are consistent with the findings in preceding univariate analysis. Applying all non-divorce firms as control bears the cost of selection bias. Across all the specifications, absolute values of coefficients of dummy divorce are much smaller (by about 35 percent) in the case of full sample control than matched sample control. Nearest neighbor propensity score matching estimator provides a reliable estimate cost of divorce. Firms after CEO divorce underperform no-event-counterparts during the same period by 3 percent of industry-adjusted OROA.

I also check the performance aggravation in the interval of 5 year divorce window with fixed effect estimation in Table 5. The results illustrate that firm performance after divorce fall significantly by about 3 percent of industry-adjusted OROA relative to prior performances. Performance drops are consistently significant at 5 percent level across two different control samples. Magnitudes of coefficients are bigger in matched sample case, similar to the pattern in Table 4, which again implies the existence of selection bias. The results are significant whether I control for years.

[Insert Table 5]

In a word, I conclude this section by stating that firms subsequently underperform after CEO divorces, both relative to previous performances and relative to non-divorce firms.

5.2 Endogeniety of CEO divorce

The preceding analysis has already shown that CEO divorce has a negative impact on firm performance. However, reverse causality may also exist. Firm performance drop is likely to trigger a divorce. An illustrative case is that when a small family firm's profit falls, the CEO

encounters financial distress. The chances are that the distress soon affects his own economic status and leads to a breaking-up with his spouse, who cannot accept a frugal life.

I tackle the potential reverse causality by comparing pre-divorce performance variations of divorce firms with those of matched non-divorce firms and all non-divorce firms. The results in Table 6 shows that difference in industry-adjusted OROA between one year before divorce and divorce year [-1, 0] of divorce firms is not significantly different from that of matched non-divorce firms and all non-divorce firms. This means that divorce firms do not underperform non-divorce firms prior to divorce. The results are consistent whether I check the difference between two years before and one year before divorce [-2,-1] or difference between two years before and divorce year [-2, 0]. I even examine performance difference between four years before divorce and two years before divorce [-4,-2], and three years before and one year before [-3,-1]. Divorce firms still do not significantly differ from non-divorce firms. And the findings are robust when I replace industry-adjusted OROA with industry-adjusted ROA.

[Insert Table 6]

Because pre-divorce performance of divorce firms is not significantly different from that of non-divorce firms, it is hard to say ex-ante performance drop causes CEO divorce. This convinces preceding insight into the negative effect of divorce on ex-post firm performance.

5.3 Robustness tests

In this section, I conduct several robustness tests. For the first step, I consider whether different matching variables will affect my findings. Table 1 shows that joint-management of divorced couple is correlated with divorce. I therefore use joint-management and CEO age, the only significant predictor of divorce in the probit regression of Table 2, as CEO characteristic

matching variables and keep all firm level characteristic matching variables (firm size, debt ratio, profitability, industry dummy and region dummy) to perform one-to-one nearest neighbor PS matching to obtain a new control group. Alternatively, I use fixed asset (Ln fixasset) and short term debt (Ln shortdebt) to replace profitability and debt ratio and keep all the other matching variables (CEO age, first marriage age, CEO male, firm size, industry dummy and region dummy). I use these two variables as new firm level matching variables because they are significantly different between divorce firms and non-divorce firms. I the same perform one-to-one nearest neighbor PS matching to get another control group. Table7 shows the regression results of Model (1) using these two new control groups. The signs and magnitudes of dummy divorce are highly consistent with those in Table 4.

[Insert Table 7]

Next, I check whether the choice of the number of nearest neighbors has an impact on the findings. Using the same matching variables as those in my main specification, I obtain 2, 5, and 10 nearest neighbors respectively. Table 8 shows the regression results of model (1) using 2, 5, and 10 nearest neighbors as control group. I find that divorce has a consistent negative effect on firm performance across all the specifications in the table.

[Insert Table 8]

5.4 Earning management?

Concerns arise that earning management may drive the underperformance of divorce firms when OROA acts as the performance measure. The falling performance after CEO divorce is arguably attributable to the CEOs' incentive for manipulation of earnings. In doing so, CEOs (owners of the business in most cases) can hide personal income to lose less wealth given the division of

property after divorce by law[7]. Nevertheless, this argument is implausible. Sophisticated CEOs have more incentive to manipulate earnings in the years before the divorce year rather than the years after. However, Table 6 clearly presents that before the divorce year, divorce firms do not perform significantly differently compared with either matched non-divorce firms or all non-divorce firms. Neither difference in industry-adjusted OROA/ROA between four years before divorce and two years before divorce [-4,-2] of divorce firms nor three years before divorce and one year before divorce [-3-1] of divorce firms is significantly different from that of matched non-divorce firms and all non-divorce firms. These findings demonstrate that divorce firms perform consistently similar to non-divorce firms. Hence, earning management has a slim chance to be the driving force of performance drop of divorce firms.

5.5 Mechanisms of negative divorce effect on firm performance

Thus far, I have verified that CEO divorce dampens firm performance. In this section, I aim to probing into underlying channels through which CEO divorce hits performance. Constrained by data availability, I am unable to explore all potential mechanisms explained in literature review. Instead, I focus on the following channels.

First of all, a large body of psychological and sociological literature documents bitter and enduring marital conflict between divorce couple. And the chances are that this conflict persists for years after divorce (e.g. Hopper, 2001; Arendell, 1986; Dillon and Emery, 1996; Johnston and Campbell, 1993). Although marital conflict takes a series of related but different phenomena (verbal fights, name calling, hatred, physical threats and violence, non-cooperation with court orders, custody battles, property disputes, burglaries, etc.) in divorce (Straus, 1979) and all forms

[7] The related Danish divorce laws stipulate the division of property between the divorcing couple.

of conflict may bring costs to a CEO and further his firm given the intertwinement of family and business, I define marital conflict, in my setting, as difference (or conflict) in interests and non-cooperation or antagonism between divorce couple in terms of firm operation. The microscope is directed to the boardroom, where conflict of interests or non-cooperation from different board members is most likely to damage firm performance. For example, when a firm is voting for distribution of remaining earnings, conflict between board members may force the investment to be passed by. Suppose a CEO's spouse board member will divorce the CEO in the future. He may urge to distribute the earnings to shareholders as dividends, knowing that he will be unseated from the board and have no stake in the firm after divorce with division of property, while the CEO wants the remaining earnings to be re-invested in the new project, focusing on sustainability of the firm. As a result, he might veto the project, either by colluding with the other members of the board or by himself. In other words, the CEO and his to-be-divorced spouse board member have disparate commitments to firm development. This leads to efficiency loss. Alternative, I may interpret this conflict as asset expropriation or rent seeking from a self-interested spouse board member in a shortly-cracked partnership.

I focus on divorce firms, and use dummy joint-management of CEO couple in the board as a proxy for marital conflict, which will impinge on firm performance. The reason for only using divorce firms is that those non-divorce firms may also have marital conflict between the couple but they just do not get divorced for whatever grounds (e.g. to maintain family honor). Therefore, using both non-divorce firms and divorce firms may gives rise to measurement errors. Divorce firms, by contrast, must have marital conflict and joint-management provides the platform for conflict to enduringly strike firm operation.

I hypothesize that joint-management of divorce couple during 5 year divorce window is negatively correlated to firm performance. Again, a fixed effect estimator is used to investigate the effect. Table 9 evidences my hypothesis.

[Insert Table 9]

Controlling for firm size, profitability and capital structure, time fixed effect and firm fixed effect, I show that joint-management exacerbates industry-adjusted OROA by 7 percent, while industry-adjusted ROA by 5 percent relative to non-joint-managed period. Although coefficients only account for those firms with variations in joint-management status and other forms of conflict between the divorce couples may not be fully captured in the dummy, the results still provide some evidence to explain one mechanism of CEO divorce shock on firm performance.

One big change after divorce is the fall of personal economic status due to division of property. Bearing in mind that most of the sample firms are family firms with fuzzy boundary between personal funds and firm funds, one may expect that decrease in collateral caused by division of property will lead to credit constraints. Divorce firms will get less access to loans. Loans are traditionally important financing resource of Danish firms (Ampenberger, Bennedsen and Zhou, 2011). Firms after CEO divorces may have financial structure change, which is correlated to performance variation.

I make the same univariate DID analysis as before to investigate this possible mechanism in Table 10. Besides debt ratio as the key indicator, I also involve short term debt (Ln shortdebt), firm size (Ln asset) and fixed asset (Ln fixasset) for robustness tests. Whether I utilize all non-divorce firms or matched non-divorce firms as control, there is no significant difference between divorce firms and either of the control samples in terms of capital structure change across

divorce years at 10 percent level. Similarly, short term debt, firm size, and fixed assets of divorce firms do not display significant difference across divorce year compared with all non-divorce firms and matched non-divorce firms. Notice that Table 1 shows that divorce firms are not significantly different from non-divorce firms in terms of size and capital structure, which means divorce firms are not smaller and more leveraged firms. The non-significance results of DID analyses suggest that divorce firms, like non-divorce firms, are professionally managed with similar firm characteristics and ambiguity of personal and corporate fund fails to prevail in those divorce firms.

[Insert Table 10]

To sum up, change in capital structure, fixed assets, and firm size is unable to explain underperformance of divorce firms relative to non-divorce firms. Marital conflict proxied by the joint-management of divorcing couple has some explanatory power of performance drop of CEO divorce firms.

6 Discussion

Over the years, the adoption of unilateral divorce law or other policy changes facilitating divorce evokes stiff debates both in U.S. (e.g. Stevensen and Wolfers, 2006) and in Europe (for instance, Piketty, 2003). Many people attribute the swift growth in divorce rate to unilateral divorce law and point the finger to the easy access to divorce, which decays traditional family structure.

However, some economists evidence that women do benefit from unilateral divorce law in the sense that domestic violence are suppressed (Stevensen and Wolfers, 2006).

This paper brings a new perspective to the debate[8]. Top managers' divorce is socially costly in the form of exacerbation of firm performance. If marital conflict is one of the mechanism channels of efficiency loss in the interval of divorce period and the divorce couple is desperate to get apart, provisions or public policies, designed to rapidly terminate an antagonistic marriage, may play a role of decongesting marital conflict and further benefiting both the couple and the firms they head. From this point of view, unilateral divorce can mitigate the magnitude of negative effect of marital conflict on firms helmed by divorce couples.

My findings may also carry some implications for corporate governance code or corporate law. Couple joint-management is likely to undermine corporate performance when divorce occurs to the couple. In an economy like Denmark, where family firms are the backbone, joint-management of a couple is popular. Therefore, the potential cost of joint-management can be high to the economy with the climbing divorce rate.

Family business researchers argue that altruism and nepotism are the main reasons for family control and family succession and they may plague firm value in some cases. My empirical study sheds light on the costs of nepotism in the case of family firms controlled by a couple who will get divorced.

To the best of my knowledge, there is no empirical evidence in literature supporting couple synergies of joint-management. Thus, my results may give some suggestive guidance for good

[8] I notice that my results come from a relatively small economy and may not be applicable to other bigger economies, especially Anglo-Saxon countries like the US and the UK. However, my research still contributes to the debate of unilateral divorce from a novel and broader perspective, introducing economic consequence of divorce on an organizational level.

corporate governance practice in respect of board composition. Couple presence at the corporate board may not be optimal.

I am fully aware that all the findings in this paper are from Denmark. These findings may not be applicable to other bigger economies like the US and the UK with different institutional background. The real effect of CEO divorce on firm performance in those economies remains unknown to us. Future research can be directed to investigate whether the similar effect exists in the context of the US and the UK.

7 Concluding remarks

The last decades witness rise in divorce rates in most industrialized countries. Academics pay increasing attention to divorce researches. A large amount of economic and sociological literature focuses on economic and well-being consequence of divorce on divorcing couples and children. However, little literature touches on consequence of divorce at a broader organizational level. Lack of knowledge in this field motivates this study.

I focus on CEOs, the key figures in corporate organizations, and scrutinize the ex-post economic consequence of CEO divorce on the firms they head. Using an informative Danish private firm dataset, I find that firms after CEO divorce underperform, both relative to previous performance and relative to matched non-divorce firms as well as all non-divorce firms.

Tense, antagonistic, and non-corporative relationship between divorcing couple looms large around divorce year. Difference in interests arises because of divergent commitments to the same firm given one party will leave the business after breaking up. My empirical results suggest that

CEO divorce hits firm performance partly through the channel of antagonism and difference in interests of divorcing couple.

The empirical results show that joint-management of the divorcing couple jeopardizes firm performance. I suggest that while no empirical evidence supports the advantages of couple presence at the corporate board, my paper draws attention to potential costs of couple presence. It may not be optimal to have a couple simultaneously present at the corporate board.

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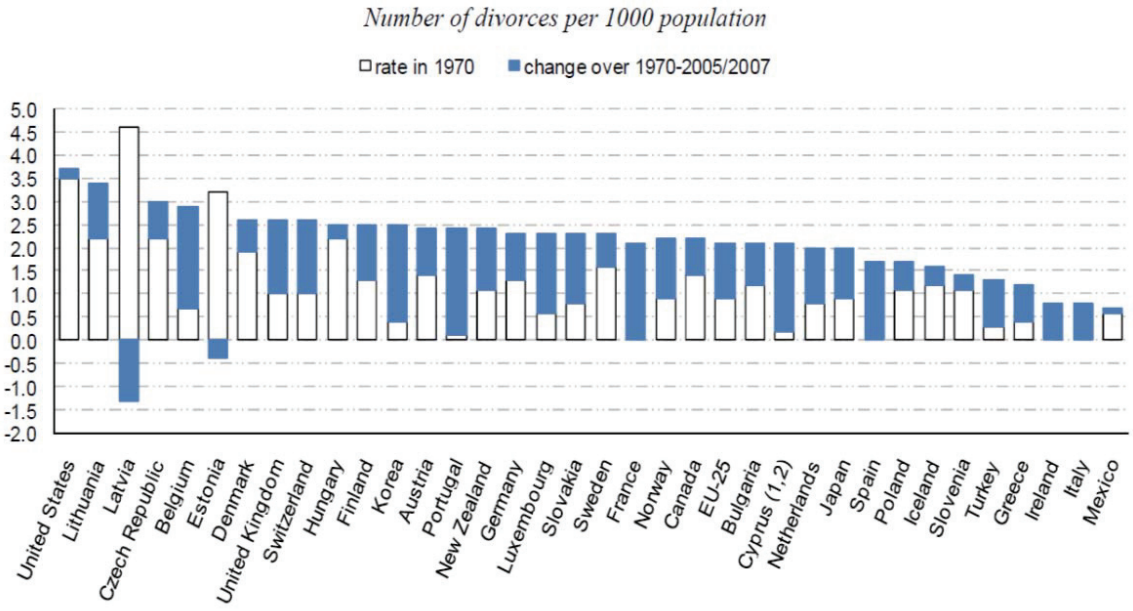
Figure 1 Divorce rates in OECD countries



Notes:

1. Data refer to 2005 for EU countries except Germany and France and to 2006 for Germany, France, Iceland, New Zealand, Turkey and the US.
2. Data source: OECD, www.oecd.org/els/social/family/database

Table 1 Descriptive Statistics

Panel A. Statisitic summary of divorce firms, mathced non-divorce firms and all non-divorce firms

	All non-divorce firms				Matched non-divorce firms				Divorce firms				Difference in mean			
	Obs No.	Mean	Median	Std. Dev.	Obs No.	Mean	Median	Std. Dev.	Obs No.	Mean	Median	Std. Dev.	All-divorce		Matched-divorce	
Matching variables (industry and region variables are not reported here)																
First marriage age	63315	27.738	26	5.830	244	28.857	27	5.921	244	28.475	27	5.591	-0.737	**	0.381	
CEO male (dummy)	63315	0.936	1	0.245	244	0.959	1	0.199	244	0.955	1	0.208	-0.019		0.004	
CEO age	63315	48.523	49	9.598	244	45.299	44	8.751	244	45.061	45	7.998	3.461	***	0.238	
Ln asset	63315	8.055	8.014	1.413	244	8.035	8.096	1.193	244	8.051	7.927	1.311	0.004		-0.016	
Profitability	53852	0.021	-0.003	0.172	244	0.017	-0.002	0.171	244	0.023	-0.007	0.169	-0.001		-0.005	
Debt ratio	63315	0.534	0.587	0.320	244	0.566	0.631	0.299	244	0.566	0.644	0.299	-0.033		0.000	
The other CEO and CEO family characteristics																
Joint-managed (dummy)	63105	0.197	0	0.398	243	0.235	0	0.425	244	0.066	0	0.248	0.132	***	0.169	***
Age difference	63105	2.811	2	2.691	243	2.926	2	3.000	244	3.324	2	3.602	-0.513	***	-0.398	
CEO tenure	63315	3.498	3	2.269	244	3.975	4	1.635	244	4.029	4	1.522	-0.530	***	-0.053	
Parent divorce (dummy)	31069	0.167	0	0.373	153	0.229	0	0.421	142	0.268	0	0.444	-0.100	***	-0.039	
The other firm characteristics																
ROA	63315	0.064	0.045	0.139	244	0.079	0.062	0.123	244	0.069	0.059	0.159	-0.005		0.010	
OROA	63314	0.092	0.064	0.176	244	0.112	0.092	0.153	244	0.101	0.088	0.197	-0.009		0.011	
Industry adj ROA	63315	0.014	-0.001	0.138	244	0.031	0.018	0.118	244	0.022	0.012	0.157	-0.008		0.009	
Industry adj OROA	63314	0.019	-0.004	0.174	244	0.039	0.020	0.146	244	0.030	0.013	0.194	-0.011		0.009	
Ln shortdebt	63267	6.648	6.727	1.774	244	6.817	6.932	1.623	244	6.855	6.904	1.710	-0.207	*	-0.038	
Ln fixasset	59332	7.185	7.215	1.735	230	7.089	7.133	1.460	230	6.964	6.973	1.669	0.221	*	0.125	

Panel B. Industry and Region Distributions of divorce firms, mathced non-divorce firms and all non-divorce firms

	All non-divorce firms	Matched non-divorce firms	Divorce firms	Difference in distribution (p-value)	
				All-divorce	Matched-divorce
Region distribution (%)					
Capital region of Denmark	28.39	38.11	39.34		
Region Zealand	11.98	11.07	10.66		
South Denmark region	23.24	19.26	17.62	0.000 ***	0.967
Central Denmark region	25.57	22.13	22.54		
North Denmark Region	10.81	9.43	9.84		
Industry distribution[9] (%)					
Agriculture, fishing, quarrying	2.87	0.41	1.23		
Manufacturing	8.30	9.84	10.25		
Electricity, gas and water supply	0.60	0	0		
Construction	11.22	9.84	11.48	0.000 ***	0.852
Ws. and retail trade; hotels, restaurants	17.59	19.67	20.08		
Transport, post and telecommunications	3.24	2.46	2.05		
Finance and business activities	51.10	50.82	48.77		
Public and personal services	5.07	6.97	6.15		

Notes:

1. The sample includes all firms in all calendar years in which a firm's CEO gets divorced.
2. I apply a nearest-neighbor propensity score matching estimator to obtain matched non-divorce firms.
3. First marriage age is the age of CEO when he gets married for the 1st time. CEO male is a dummy variable which is equal to one if the firm's CEO is male and zero otherwise. CEO age is the CEO's age in a certain calendar year. Ln asset is firm size, defined as the natural logarithm of the firm's total assets measured in one thousand Danish Kroner. Profitability is defined as a firm's industry-adjusted OROA in the year prior to the calendar year. Debt ratio is capital structure, defined as the ratio of book debt to total asset. Joint-managed is a dummy variable which is equal to one if the firm's CEO and his/her spouse are simultaneously present in either managerial board or supervisory board in the year or zero otherwise. Age difference is the age difference between CEO and his/her spouse. CEO tenure is the difference between a calendar year and the year when the CEO first works in the firm. Parent divorce is a dummy variable which is equal to one if the CEO has divorced parents and zero otherwise. ROA is returns on Assets, defined as net income over the book value of total assets. OROA is Operating Retunes on Assets, defined as the ratio of earnings before interests and taxes (EBIT) to the book values of assets. Industry adj ROA is industry adjusted Returns on Assets, defined as returns on assets minus the industry ROA means and industry ROA means are arithmetic averages of all the registered firms' yearly ROA in KOB dataset. I classify different industry in light of the Danish Industrial Classification 2003[10].Industry adj OROA is industry adjusted Operating Returns on Assets, defined as operating returns on assets minus the industry OROA means, and industry OROA means are arithmetic averages of all the registered firms' yearly OROA in KOB dataset. Like that in ROA, I classify different industry in light of the Danish Industrial Classification 2003. Ln fixasset is firm's fixed asset, defined as the natural logarithm of the firm's fixed assets measured in one thousand Danish Kroner. Ln shortdebt is Firm's short term debt, defined as the natural logarithm of the firm's current liability with maturity less than one year, measured in one thousand Danish Kroner.
4. ***, **, and * refer to significance level of 1, 5, and 10 percent respectively.
5. Data sources: *Købmandsstandens Oplysningsbureau* (KOB), *Erhvervs-og Selskab-sstyrelsen* (E&S) and the official Danish Civil Registration System.

[9] I use 2-digit coding from Danish Industrial Classification 2003 to identify 8 industries. Danish Industrial Classification 2003 is based on NACE (Nomenclature generale des Activitiés économique dans les Communautes Européennes) prepared by the EU in 1970.

[10] Here I use 4-digit coding from Danish Industrial Classification 2003 to identify 27 different industry groups and calculate industry ROA and OROA means year by year.

Table 2 Determinants of CEO Divorce

	Dependent variable	
	Dummy: divorce	
CEO age	-0.014	**
	(0.006)	
First marriage age	0.003	
	(0.010)	
CEO male	0.408	
	(0.314)	
Profitability	0.249	
	(0.323)	
Ln asset	0.024	
	(0.032)	
Debt ratio	0.030	
	(0.199)	
_cons	-5.496	
	(0.617)	
Industry dummy	Yes	
Region dummy	Yes	
R-sqaured	0.033	
N	8403	

Notes:

1. This table reports the determinants of CEO divorce in 2003.
2. The dependent variable is dummy Divorce which equals one if the CEO of a firm gets divorced in 2003. CEO age is the CEO's age in 2003. First marriage age is the age of CEO when he gets married for the 1st time. CEO male is a dummy variable which is equal to one if the firm's CEO is male and zero otherwise. Ln asset is firm size, defined as the natural logarithm of the firm's total assets measured in one thousand Danish Kroner in 2003. Profitability is defined as a firm's industry-adjusted OROA in 2002. Debt ratio is capital structure, defined as the ratio of book debt to total asset in 2003.
3. ***, **, and * refer to significance level of 1, 5, and 10 percent respectively.
4. Standard errors are reported in parentheses.
5. Data source: *Købmandsstandens Oplysningsbureau* (KOB) database, *Erhvervs-og Selskab-sstyrelsen* (E&S) and the official Danish Civil Registration System.

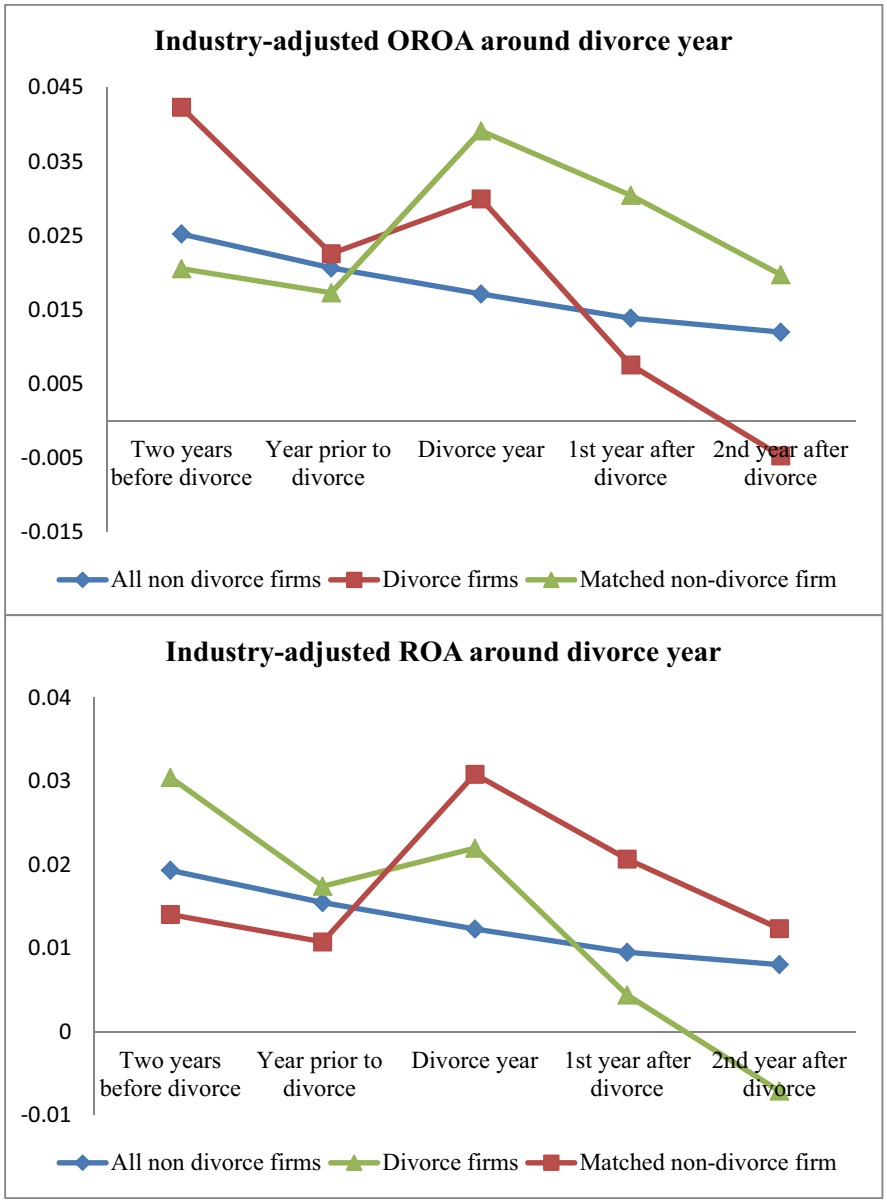
Table 3 Difference in difference analysis of performance around CEO divorce year

	All non-divorce firms					Matched non-divorce firms				Divorce firms					Difference in mean			
	Obs No.	Mean		Median	Std. Dev.	Obs No.	Mean	Median	Std. Dev.	Obs No.	Mean		Median	Std. Dev.	All-divorce		Matched-divorce	
ROA (two years before)	38708	0.063		0.045	0.111	244	0.060	0.048	0.115	244	0.071		0.046	0.122	-0.008		-0.011	
ROA (two years after)	38708	0.070		0.055	0.113	244	0.073	0.060	0.111	244	0.053		0.042	0.115	0.017	**	0.020	*
Difference in ROA (after-before)	38708	0.007	***	0.005	0.128	244	0.012	0.005	0.128	244	-0.019	**	-0.005	0.137	0.026	***	0.031	***
OROA (two years before)	38706	0.092		0.067	0.143	244	0.093	0.075	0.147	244	0.106		0.072	0.156	-0.013		-0.013	
OROA (two years after)	38708	0.097		0.075	0.144	244	0.105	0.087	0.147	244	0.079		0.065	0.146	0.018	**	0.026	**
Difference in OROA (after-before)	38706	0.004	***	0.004	0.160	244	0.012	0.002	0.167	244	-0.027	**	-0.008	0.171	0.032	***	0.039	**
Industry adj ROA(two years before)	38708	0.017		0.003	0.109	244	0.012	0.003	0.113	244	0.024		0.003	0.119	-0.007		-0.012	
Industry adj ROA (two years after)	38708	0.009		-0.002	0.109	244	0.017	0.004	0.107	244	-0.001		-0.001	0.113	0.010		0.018	*
Difference in industry adj ROA (after-before)	38708	-0.009	***	-0.009	0.127	244	0.004	-0.001	0.125	244	-0.025	***	-0.019	0.136	0.017	**	0.029	**
Industry adj OROA (two years before)	38706	0.023		0.001	0.141	244	0.019	0.007	0.146	244	0.032		0.000	0.151	-0.010		-0.014	
Industry adj OROA (two years after)	38708	0.013		-0.004	0.140	244	0.025	0.004	0.142	244	0.001		-0.003	0.143	0.011		0.024	*
Difference in industry adj OROA (after-before)	38706	-0.010	***	-0.010	0.158	244	0.006	0.000	0.164	244	-0.031	***	-0.016	0.170	0.021	**	0.037	**

Notes:

1. This table reports the performance change of firms two years before and after divorce year.
2. I apply a nearest-neighbor propensity score matching estimator to obtain matched non-divorced firms.
3. ROA (two years before) is two year mean before divorce year of returns on Assets (ROA), defined as net income over the book value of total assets. ROA (two years after) is two year mean after divorce year of returns on Assets (ROA). OROA (two years before) is two year mean before divorce year of Operating Retunes on Assets, defined as the ratio of earnings before interests and taxes (EBIT) to the book values of assets. OROA (two years after) is two year mean after divorce year of Operating Retunes on Assets. Industry adj ROA (two years before) is two year mean before divorce year of industry adjusted Returns on Assets, defined as returns on assets minus the industry ROA means and industry ROA means are arithmetic averages of all the registered firms' yearly ROA in KOB dataset. I classify different industry in light of the Danish Industrial Classification 2003. Industry adj ROA (two years after) is two year mean after divorce year of industry adjusted Returns on Assets. Industry adj OROA (tow year before) is two year mean before divorce year of industry adjusted Operating Returns on Assets, defined as operating returns on assets minus the industry OROA means, and industry OROA means are arithmetic averages of all the registered firms' yearly OROA in KOB dataset. Like that in ROA, I classify different industry in light of the Danish Industrial Classification 2003. Industry adj OROA (tow year after) is two year mean after divorce year of industry adjusted Operating Returns on Assets. Difference in ROA, OROA, industry adj ROA and industry adj OROA are two year mean after divorce year minus two year mean before divorce year of ROA, OROA, industry adj ROA and industry OROA respectively.
4. ***, **, and * refer to significance level of 1, 5, and 10 percent respectively.
5. Data source: *Købmandsstandens Oplysningsbureau* (KOB) database, *Erhvervs-og Selskab-sstyrelsen* (E&S) and the official Danish Civil Registration System.

Figure 2 Industry-adjusted ROA and OROA evolution around divorce year



Notes:

1. This Figure shows firm performance evolution during 5 year divorce window centered by divorce year.
2. I apply a nearest-neighbor propensity score matching estimator to obtain matched non-divorced firms.
3. Industry adj ROA is industry adjusted Returns on Assets, defined as returns on assets minus the industry ROA means and industry ROA means are arithmetic averages of all the registered firms' yearly ROA in KOB dataset. I classify different industry in light of the Danish Industrial Classification 2003. Industry adj OROA is industry adjusted Operating Returns on Assets, defined as operating returns on assets minus the industry OROA means, and industry OROA means are arithmetic averages of all the registered firms' yearly OROA in KOB dataset. Like that in ROA, I classify different industry in light of the Danish Industrial Classification 2003.
4. Data source: *Købmandsstandens Oplysningsbureau* (KOB) database, *Erhvervs-og Selskab-sstyrelsen* (E&S) and the official Danish Civil Registration System.

Table 4 Divorce effect on firm performance

	Dependent variable: Difference in Industry adj Operating Return on Assets (OROA) (two-year mean after divorce year minus two-year mean before divorce year)											
	Matched non-divorce firms as control								All non-divorce firms as control			
Divorce	-0.037	**	-0.035	***	-0.035	**	-0.034	**	-0.023	**	-0.020	**
	(0.015)		(0.013)		(0.013)		(0.013)		(0.010)		(0.010)	
CEO male					0.056		0.058		-0.001		-0.001	
					(0.040)		(0.042)		(0.004)		(0.004)	
CEO age					0.000		0.000		0.000	***	-0.001	***
					(0.001)		(0.001)		(0.000)		(0.000)	
Profitability			-0.441	***	-0.448	***	-0.444	***	-0.422	***	-0.421	***
			(0.053)		(0.053)		(0.053)		(0.007)		(0.007)	
Ln asset			-0.008		-0.007		-0.009		-0.001		-0.001	
			(0.006)		(0.006)		(0.006)		(0.001)		(0.001)	
Debt ratio			0.037	*	0.042	*	0.037		0.021	***	0.023	***
			(0.022)		(0.022)		(0.023)		(0.003)		(0.003)	
_cons	-0.064		-0.020		-0.006		-0.085		0.019	**	-0.016	
	(0.049)		(0.056)		(0.062)		(0.070)		(0.008)		(0.012)	
Year dummy	Yes		Yes		No		Yes		No		Yes	
R-squared	0.044		0.262		0.243		0.266		0.203		0.205	
N	488		488		488		488		38950		38950	

Notes:

1. The sample includes all firm observations during 5 year divorce window centered by divorce year.
2. Dependent variable is two-year mean after divorce year minus two-year mean before divorce year of industry adjusted OROA, defined as operating returns on assets minus the industry OROA means, and industry OROA means are arithmetic averages of all the registered firms' yearly OROA in KOB dataset. I classify different industry in light of the Danish Industrial Classification 2003. Divorce is a dummy variable which is equal to one if the firm's CEO experiences a divorce and zero otherwise. CEO male is a dummy variable which is equal to one if the firm's CEO is male and zero otherwise. CEO age is the CEO's age in a certain calendar year. Ln asset is firm size, defined as the natural logarithm of the firm's total assets measured in one thousand Danish Kroner. Profitability is defined as a firm's industry-adjusted OROA last year. Debt ratio is capital structure, defined as the ratio of book debt to total asset.
3. The first 4 columns use matched non-divorce firms as control while the last 2 columns use all non-divorce firms as control. I apply a one-to-one nearest-neighbor propensity score matching estimator to obtain one matched non-divorce firm for each divorce firm. The matching variables I use are CEO age, first marriage age, CEO gender, firm size, profitability, debt ratio, industry dummy and region dummy.
4. ***, **, and * refer to significance level of 1, 5, and 10 percent respectively.
5. Robust standard errors are reported in parentheses.
6. Data source: *Købmandsstandens Oplysningsbureau* (KOB) database, *Erhvervs-og Selskab-sstyrelsen* (E&S) and the official Danish Civil Registration System.

Table 5 Divorce effect on firm performance (firm fixed effect estimator)

	Dependent variable: Industry-adjusted Operating Return on Assets (OROA)			
	Matched non-divorce firms as control		All non-divorce firms as control	
Divorce	-0.027 **	-0.055 ***	-0.024 **	-0.047 ***
	(0.012)	(0.010)	(0.010)	(0.010)
Ln asset	0.050 **	0.037 *	0.059 ***	0.024 ***
	(0.020)	(0.019)	(0.003)	(0.003)
Debt ratio	-0.539 ***	-0.510 ***	-0.362 ***	-0.312 ***
	(0.053)	(0.051)	(0.007)	(0.007)
Ln fixasset	-0.032 ***	-0.028 ***	-0.023 ***	-0.014 ***
	(0.008)	(0.008)	(0.001)	(0.001)
Ln shortdebt	0.058 ***	0.055 ***	0.027 ***	0.027 ***
	(0.011)	(0.011)	(0.001)	(0.001)
_cons	-0.166	-0.151	-0.198 ***	-0.087 ***
	(0.108)	(0.108)	(0.019)	(0.016)
Year dummy	Yes	No	Yes	No
Within R-squared	0.161	0.146	0.106	0.076
N	2294	2294	77506	77506

Notes:

1. The sample includes all firm observations during 5 year divorce window centered by divorce year.
2. Dependent variable is industry adjusted OROA, defined as operating returns on assets minus the industry OROA means, and industry OROA means are arithmetic averages of all the registered firms' yearly OROA in KOB dataset. I classify different industry in light of the Danish Industrial Classification 2003. Divorce is a dummy which equals one if a CEO has gotten divorced in that year (1st and 2nd year after divorce year) and zero otherwise. Ln asset is firm size, defined as the natural logarithm of the firm's total assets measured in one thousand Danish Kroner. Debt ratio is capital structure, defined as the ratio of book debt to total asset. Ln fixasset is firm's fixed asset, defined as the natural logarithm of the firm's fixed assets measured in one thousand Danish Kroner. Ln shortdebt is Firm's short term debt, defined as the natural logarithm of the firm's current liability with maturity less than one year, measured in one thousand Danish Kroner.
3. The first 2 columns use matched non-divorce firms as control while the last 2 columns use all non-divorce firms as control. I apply a one-to-one nearest-neighbor propensity score matching estimator to obtain matched sample.
4. ***, **, and * refer to significance level of 1, 5, and 10 percent respectively.
5. Robust standard errors are reported in parentheses.
6. Data source: *Købmandsstandens Oplysningsbureau* (KOB) database, *Erhvervs-og Selskab-sstyrelsen* (E&S) and the official Danish Civil Registration System.

Table 6 Difference in difference analysis of pre-divorce performance

	All non-divorce firms	Matched non-divorce firms	Divorce firms	Difference in mean	
				Matched-divorce	All-divorce
Difference in Industry adj OROA	-0.008	0.019	-0.012	0.031	0.004
[-2,0]	(0.001)	(0.013)	(0.014)	(0.019)	(0.013)
	[38707]	[244]	[244]		
Difference in Industry adj OROA	-0.004	0.022	0.007	0.014	-0.011
[-1,0]	(0.001)	(0.013)	(0.013)	(0.018)	(0.012)
	[38707]	[244]	[244]		
Difference in Industry adj OROA	-0.005	-0.003	-0.020	0.016	0.015
[-2,-1]	(0.001)	(0.011)	(0.013)	(0.017)	(0.012)
	[38706]	[244]	[244]		
Difference in Industry adj OROA	-0.007	-0.012	-0.016	0.003	0.009
[-4,-2]	(0.001)	(0.014)	(0.018)	(0.023)	(0.019)
	[19368]	[99]	[102]		
Difference in Industry adj OROA	-0.007	-0.002	-0.023	0.021	0.016
[-3,-1]	(0.001)	(0.014)	(0.015)	(0.021)	(0.015)
	[28994]	[164]	[170]		
Difference in Industry adj ROA	-0.007	0.017	-0.008	0.025	0.001
[-2,0]	(0.001)	(0.010)	(0.011)	(0.016)	(0.010)
	[38708]	[244]	[244]		
Difference in Industry adj ROA	-0.003	0.020	0.005	0.016	-0.008
[-1,0]	(0.001)	(0.011)	(0.011)	(0.015)	(0.009)
	[38708]	[244]	[244]		
Difference in Industry adj ROA	-0.004	-0.003	-0.013	0.010	0.009
[-2,-1]	(0.001)	(0.009)	(0.011)	(0.014)	(0.010)
	[38708]	[244]	[244]		
Difference in Industry adj ROA	-0.006	-0.008	-0.006	-0.002	0.000
[-4,-2]	(0.001)	(0.012)	(0.015)	(0.019)	(0.015)
	[19369]	[99]	[102]		
Difference in Industry adj ROA	-0.006	-0.004	-0.016	0.012	0.010
[-3,-1]	(0.001)	(0.012)	(0.012)	(0.017)	(0.012)
	[28996]	[164]	[170]		

Notes:

1. This table reports the performance change of firms before divorce year.
2. I apply a nearest-neighbor propensity score matching estimator to obtain matched non-divorced firms.
3. Difference in industry adj OROA (ROA) is performance change in industry adj OROA (ROA) between two years indicated in brackets. Year 0 means divorce year. For example, difference in industry adj OROA [-2, 0] means industry-adjusted OROA difference between two years before divorce and divorce year. Industry adj OROA is defined as operating returns on assets minus the industry OROA means, and industry OROA means are arithmetic averages of all the registered firms' yearly OROA in KOB dataset. I classify different industry in light of the Danish Industrial Classification 2003. Industry adj ROA is defined as returns on assets minus the industry ROA means and industry ROA means are arithmetic averages of all the registered firms' yearly ROA in KOB dataset. I classify different industry in light of the Danish Industrial Classification 2003.
4. ***, **, and * refer to significance level of 1, 5, and 10 percent respectively.
5. Standard errors are reported in parentheses.
6. Observation numbers are reported in brackets.
7. Data source: *Købmandsstandens Oplysningsbureau* (KOB) database, *Erhvervs-og Selskab-sstyrelsen* (E&S) and the official Danish Civil Registration System.

Table 7 Divorce effect on firm performance (alternative matching variables)

	Dependent variable: Difference in Industry-adjusted Operating Return on Assets (OROA) (two-year mean after divorce year minus two-year mean before divorce year)			
	Alternative matching variables (set 1)		Alternative matching variables (set 2)	
Divorce	-0.028 **	-0.029 **	-0.035 **	-0.034 **
	(0.014)	(0.013)	(0.014)	(0.014)
CEO male	-0.001	-0.001	-0.001	0.000
	(0.001)	(0.001)	(0.001)	(0.001)
CEO age	0.081 *	0.087 *	-0.004	-0.009
	(0.043)	(0.048)	(0.034)	(0.033)
Profitability	-0.379 ***	-0.375 ***	-0.441 ***	-0.439 ***
	(0.055)	(0.055)	(0.055)	(0.054)
Ln asset	-0.009 *	-0.010 *	-0.007	-0.010 *
	(0.005)	(0.005)	(0.005)	(0.005)
Debt ratio	0.076 ***	0.074 ***	0.011	0.013
	(0.025)	(0.025)	(0.027)	(0.027)
_cons	0.011	-0.057	0.097	-0.016
	(0.064)	(0.075)	(0.067)	(0.074)
Year dummy	No	Yes	No	Yes
R-squared	0.202	0.217	0.228	0.250
N	477	477	488	488

Notes:

1. The sample includes all the divorce firms and matched non-divorce firms during 5 year divorce window centered by divorce year, using alternative matching variables.
2. Dependent variable is two-year mean after divorce year minus two-year mean before divorce year of industry adjusted OROA, defined as operating returns on assets minus the industry OROA means, and industry OROA means are arithmetic averages of all the registered firms' yearly OROA in KOB dataset. I classify different industry in light of the Danish Industrial Classification 2003. Divorce is a dummy variable which is equal to one if the firm's CEO experiences a divorce and zero otherwise. CEO male is a dummy variable which is equal to one if the firm's CEO is male and zero otherwise. CEO age is the CEO's age in a certain calendar year. Ln asset is firm size, defined as the natural logarithm of the firm's total assets measured in one thousand Danish Kroner. Profitability is defined as a firm's industry-adjusted OROA last year. Debt ratio is capital structure, defined as the ratio of book debt to total asset.
3. In the first 2 columns, I apply a one-to-one nearest-neighbor propensity score matching estimator to obtain one matched non-divorce firm for each divorce firm. The matching variables are CEO age, CEO male, first marriage age, firm size, Ln fixasset Ln shortdebt, industry dummy and region dummy. In the last 2 columns, I apply a one-to-five nearest-neighbor propensity score matching estimator to obtain one matched non-divorce firms for each divorce firm. The matching variables are CEO age, joint-management, firm size, profitability, debt ratio, industry dummy and region dummy.
4. ***, **, and * refer to significance level of 1, 5, and 10 percent respectively.
5. Robust standard errors are reported in parentheses.
6. Data source: *Købmandsstandens Oplysningsbureau* (KOB) database, *Erhvervs-og Selskab-sstyrelsen* (E&S) and the official Danish Civil Registration System.

Table 8 Divorce effect on firm performance (2, 5 and 10 nearest neighbors matching)

	Dependent variable: Difference in Industry-adjusted Operating Return on Assets (OROA) (two-year mean after divorce year minus two-year mean before divorce year)											
	2 nearest neighbors matching				5 nearest neighbors matching				10 nearest neighbors matching			
Divorce	-0.023	**	-0.023	**	-0.019	*	-0.019	*	-0.019	*	-0.019	*
	(0.012)		(0.012)		(0.011)		(0.011)		(0.010)		(0.010)	
CEO male	-0.001		0.000		-0.001	**	-0.001	**	-0.001		-0.001	
	(0.001)		(0.001)		(0.001)		(0.001)		(0.000)		(0.000)	
CEO age	0.013		0.010		0.017		0.019		0.009		0.019	
	(0.028)		(0.030)		(0.023)		(0.025)		(0.015)		(0.015)	
Profitability	-0.406	***	-0.406	***	-0.417	***	-0.415	***	-0.433	***	-0.432	***
	(0.044)		(0.044)		(0.035)		(0.036)		(0.030)		(0.031)	
Ln asset	-0.005		-0.006		-0.002		-0.002		0.001		0.000	
	(0.004)		(0.004)		(0.003)		(0.003)		(0.002)		(0.002)	
Debt ratio	0.038	**	0.035	*	0.041	***	0.032	**	0.036	***	0.030	**
	(0.018)		(0.019)		(0.014)		(0.014)		(0.011)		(0.012)	
_cons	0.036		0.068		0.025		0.028		-0.013		0.026	
	(0.048)		(0.061)		(0.038)		(0.050)		(0.032)		(0.044)	
Year dummy	No		Yes		No		Yes		No		Yes	
R-squared	0.210		0.219		0.202		0.210		0.211		0.218	
N	732		732		1464		1464		2684		2684	

Notes:

1. The sample includes all the divorce firms and matched non-divorce firms during 5 year divorce window centered by divorce year.
2. Dependent variable is two-year mean after divorce year minus two-year mean before divorce year of industry adjusted OROA, defined as operating returns on assets minus the industry OROA means, and industry OROA means are arithmetic averages of all the registered firms' yearly OROA in KOB dataset. I classify different industry in light of the Danish Industrial Classification 2003. Divorce is a dummy variable which is equal to one if the firm's CEO experiences a divorce and zero otherwise. CEO male is a dummy variable which is equal to one if the firm's CEO is male and zero otherwise. CEO age is the CEO's age in a certain calendar year. Ln asset is firm size, defined as the natural logarithm of the firm's total assets measured in one thousand Danish Kroner. Profitability is defined as a firm's industry-adjusted OROA last year. Debt ratio is capital structure, defined as the ratio of book debt to total asset.
3. In the first 2 columns, I apply a one-to-two nearest-neighbor propensity score matching estimator to obtain two matched non-divorce firm for each divorce firm. In the middle 2 columns, I apply a one-to-five nearest-neighbor propensity score matching estimator to obtain five matched non-divorce firms for each divorce firm. In the last 2 columns, I apply a one-to-ten nearest-neighbor propensity score matching estimator to obtain ten matched non-divorce firms for each divorce firm. Across all the columns, the matching variables I use are CEO age, first marriage age, CEO gender, firm size, profitability, debt ratio, industry dummy and region dummy.
4. ***, **, and * refer to significance level of 1, 5, and 10 percent respectively.
5. Robust standard errors are reported in parentheses.
6. Data source: *Købmandsstandens Oplysningsbureau* (KOB) database, *Erhvervs-og Selskab-sstyrelsen* (E&S) and the official Danish Civil Registration System.

Table 9 Marital conflict and firm performance

	Dependent Variable			
	Industry adj ROA		Industry adj OROA	
Joint-managed	-0.050	**	-0.069	**
	(0.020)		(0.027)	
Ln asset	0.035		0.039	
	(0.023)		(0.029)	
Debt ratio	-0.524	***	-0.610	***
	(0.065)		(0.082)	
Ln fixasset	-0.013	*	-0.016	
	(0.008)		(0.010)	
Ln shortdebt	0.056	***	0.068	***
	(0.015)		(0.018)	
_cons	-0.105		-0.091	
	(0.117)		(0.149)	
Year dummy	Yes		Yes	
Within R-squared	0.188		0.168	
N	237		237	

Notes:

1. The sample only includes divorce firms during 5 year divorce window centered by divorce year.
2. In the 1st column, dependent variable is industry adjusted OROA, defined as operating returns on assets minus the industry OROA means, and industry OROA means are arithmetic averages of all the registered firms' yearly OROA in KOB dataset. I classify different industry in light of the Danish Industrial Classification 2003. In the 2nd column, dependent variable is industry adj ROA is industry adjusted Returns on Assets, defined as returns on assets minus the industry ROA means and industry ROA means are arithmetic averages of all the registered firms' yearly ROA in KOB dataset. I classify different industry in light of the Danish Industrial Classification 2003. Joint-managed is a dummy variable which is equal to one if the firm's CEO and his/her spouse are simultaneously present in either managerial board or supervisory board in the year or zero otherwise. Ln asset is firm size, defined as the natural logarithm of the firm's total assets measured in one thousand Danish Kroner. Debt ratio is capital structure, defined as the ratio of book debt to total asset. Ln fixasset is firm's fixed asset, defined as the natural logarithm of the firm's fixed assets measured in one thousand Danish Kroner. Ln shortdebt is Firm's short term debt, defined as the natural logarithm of the firm's current liability with maturity less than one year, measured in one thousand Danish Kroner
3. ***, **, and * refer to significance level of 1, 5, and 10 percent respectively.
4. Robust standard errors are reported in parentheses.
5. Data source: *Købmandsstandens Oplysningsbureau* (KOB) database, *Erhvervs-og Selskab-sstyrelsen* (E&S) and the official Danish Civil Registration System.

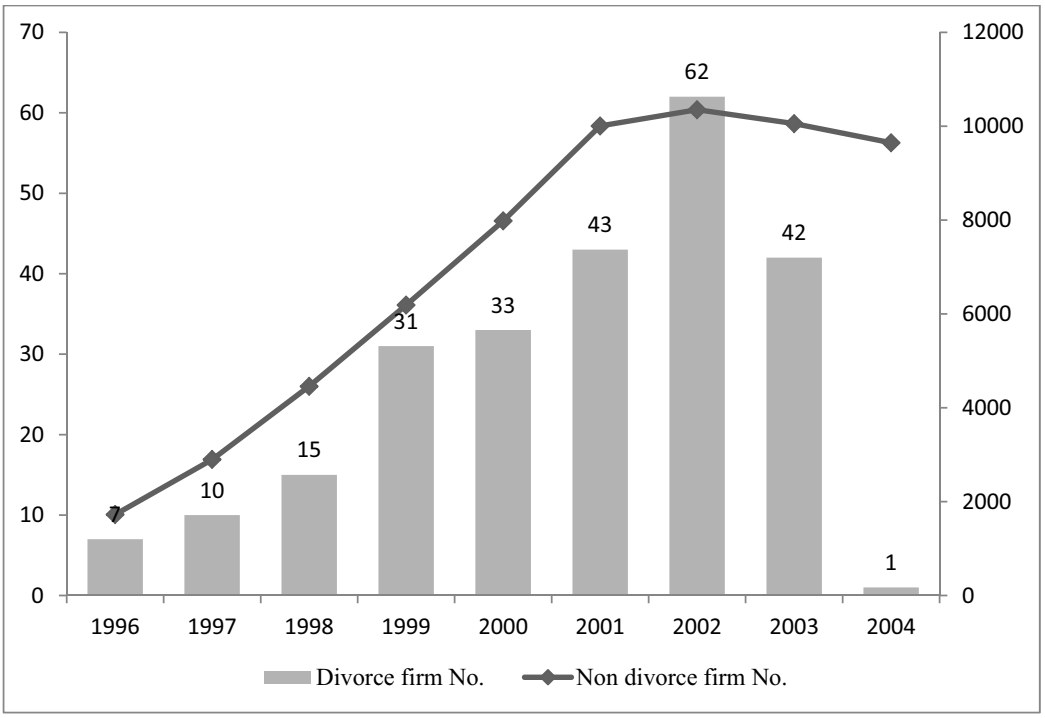
Table 10 Difference in difference analysis of capital structure, short term debt, total assets and fixed assets around divorce years

	All non-divorce firms	Matched non-divorce firms	Divorce firms	Difference in mean: Matched-divorce	Difference in mean: All-divorce
Difference in debt ratio	-0.028	-0.023	-0.020	-0.003	-0.008
(Two year after- two year before)	(0.180)	(0.174)	(0.195)	(0.017)	(0.012)
	[38708]	[244]	[244]		
Difference in Ln asset	0.201	0.249	0.180	0.069	0.021
(Two year after- two year before)	(0.577)	(0.544)	(0.627)	(0.053)	(0.037)
	[38708]	[244]	[244]		
Difference in Ln shortdebt	0.130	0.263	0.147	0.117	-0.016
(Two year after- two year before)	(0.980)	(0.903)	(1.024)	(0.087)	(0.063)
	[38630]	[244]	[243]		
Difference in Ln fixasset	0.051	0.102	0.009	0.093	0.042
(Two year after- two year before)	(0.881)	(0.825)	(0.988)	(0.086)	(0.059)
	[34579]	[223]	[223]		

Notes:

1. The sample includes all firm observations during 5 year window centered by divorce year.
2. I apply a nearest-neighbor propensity score matching estimator to obtain matched non-divorced firms.
3. Ln asset is firm size, defined as the natural logarithm of the firm's total assets measured in one thousand Danish Kroner. Debt ratio is capital structure, defined as the ratio of book debt to total asset. Ln fixasset is firm's fixed asset, defined as the defined as the natural logarithm of the firm's fixed assets measured in one thousand Danish Kroner. Ln shortdebt is Firm's short term debt, defined as the natural logarithm of the firm's current liability with maturity less than one year, measured in one thousand Danish Kroner. Difference in debt ratio, Ln asset, Ln shortdebt, and Ln fixasset is two year mean after divorce year minus two year mean before divorce year of debt ratio, Ln asset, Ln shortdebt, and Ln fixasset respectively.
4. ***, **, and * refer to significance level of 1, 5, and 10 percent respectively.
5. Standard errors are reported in parentheses.
6. Observation numbers are reported in brackets.
7. Data source: *Købmandsstandens Oplysningsbureau* (KOB) database, *Erhvervs-og Selskab-sstyrelsen* (E&S) and the official Danish Civil Registration System.

Appendix 1 Sample size of divorce firms and non-divorce firms between 1996 through 2004



Notes:

1. This figure reports sample size of CEO divorce firms and non-divorce firms in all divorce years in which a firm's CEO gets divorced.
2. Data source: Købmandsstandens Oplysningsbureau (KOB) database, *Erhvervs-og Selskab-sstyrelsen* (E&S) and the official Danish Civil Registration System.

Appendix 2 Comparison of interactions of major matching variables between matched non-divorce firms and divorce firms

	Matched non-divorce firms	Divorce firms	Difference
First marriage age* CEO male	27.738	27.156	0.582
	(8.192)	(8.028)	(0.734)
	[244]	[244]	
First marriage age* CEO age	1297.295	1282.832	14.463
	(332.761)	(348.456)	(30.845)
	[244]	[244]	
First marriage age*Ln asset	231.057	229.451	1.606
	(55.634)	(62.881)	(5.375)
	[244]	[244]	
First marriage age*Profitability	0.510	0.664	-0.154
	(4.864)	(4.980)	(0.446)
	[244]	[244]	
First marriage age*Debt ratio	16.217	16.088	0.129
	(9.127)	(9.171)	(0.828)
	[244]	[244]	
CEO male*CEO age	0.543	0.540	0.003
	(0.312)	(0.315)	(0.028)
	[244]	[244]	
CEO male*Ln asset	7.715	7.702	0.013
	(1.989)	(2.111)	(0.186)
	[244]	[244]	
CEO male*Profitability	0.022	0.020	0.002
	(0.164)	(0.165)	(0.015)
	[244]	[244]	
CEO male*Debt ratio	43.594	43.074	0.520
	(12.494)	(12.262)	(1.121)
	[244]	[244]	
CEO age*Ln asset	365.306	364.254	1.052
	(94.275)	(95.767)	(8.603)
	[244]	[244]	
CEO age*Profitability	0.727	0.958	-0.231
	(7.738)	(7.611)	(0.695)
	[244]	[244]	
CEO age*Debt ratio	25.415	25.154	0.261
	(14.366)	(13.838)	(1.277)
	[244]	[244]	

(Appendix 2,continuous)

Ln asset*Profitability	0.154	0.182	-0.028
	[244]	[244]	
Ln asset*Debt ratio	4.616	4.613	0.003
	(2.575)	(2.630)	(0.236)
	[244]	[244]	
Profitability*Debt ratio	-0.004	0.001	-0.005
	(0.106)	(0.101)	(0.009)
	[244]	[244]	

Notes:

1. The sample includes all firm observations during 5 year window centered by divorce year.
2. I apply a nearest-neighbor propensity score matching estimator to obtain matched non-divorce firms.
3. First marriage age is the age of CEO when he gets married for the 1st time. CEO male is a dummy variable which is equal to one if the firm's CEO is male and zero otherwise. CEO age is the CEO's age in a certain calendar year. Ln asset is firm size, defined as the natural logarithm of the firm's total assets measured in one thousand Danish Kroner. Profitability is defined as a firm's industry-adjusted OROA last year. Debt ratio is capital structure, defined as the ratio of book debt to total asset.
4. ***, **, and * refer to significance level of 1, 5, and 10 percent respectively.
5. Standard errors are reported in parentheses.
6. Observation numbers are reported in brackets.
7. Data source: *Købmandsstandens Oplysningsbureau* (KOB) database, *Erhvervs-og Selskab-sstyrelsen* (E&S) and the official Danish Civil Registration System.

Conclusions

The dissertation empirically examines corporate performance and capital structure of family firms.

The first chapter deals with the capital structure of family firms with a focus on the debt-equity mix. The chapter consists of a literature review and an empirical analysis. In the review, we point out that risk aversion, agency theory, and control considerations serve as the most important theories to explain the capital structure of family firms. While risk aversion of the controlling families makes family firms less leveraged, control considerations have an opposite impact. The literature review also shows that evidence on capital structure of family firms is inconclusive. Large-scale evidence on private family firms is almost missing.

In the empirical analysis, we examine the debt leverage of family firms, using an informative dataset covering around 200,000 private and public Danish firms. We find that family firms are less leveraged than non-family firms. The findings are consistent across all types of family firms we define. Whereas small firms have the lowest leverage, entrepreneurial firms have the highest. We conclude that several features of family firms, such as risk aversion and control considerations, rather than differences in other firm-specific characteristics account for the lower levels of leverage in family firms.

The second chapter provides new evidence examining whether family firms are superior performers under the background of current global financial crisis. Using a dataset covering firms from S&P 500 (US), FTSE100 (UK), DAX 30 (Germany), CAC 40 (France), and FTSE MIB 40 (Italy) during the period of 2006-2010, I find that family firms outperform non-family firms in OROA only when the founder is CEO, a board member or a significant blockholder. By contrast, Tobin's Q and risk-adjusted Alpha of founder firms do not differ from those of the

other firms. I argue that the attenuation of the market value premium of founder firms is ascribable to high volatility of stock prices and investors' overreaction during the crisis (Veronesi, 1999; Glode *et al.*, 2010). I also find that founder firms invest less and have better access to the credit market during the crisis. The findings suggest that the superior performance of founder firms is largely caused by less incentive to invest in risky projects with a high likelihood of failure in order to boost earnings during the crisis. Furthermore, the findings also suggest that founder firms bear the least agency costs, and that Tobin's Q and Alpha may not be the most appropriate measures of corporate performance during the financial crisis.

The third chapter estimates the economic consequence of a family event— CEO divorce on the firm performance. The chapter shows that divorce has a significant negative effect on economic outcome of an organization, in addition to its widely-documented impact on individuals. Using the same dataset in the first chapter, which covers almost all Danish private firms and CEO personal and family information (like CEO's marriage history), I find that firms subsequently underperform after CEO divorce, both relative to previous performance and relative to non-divorce firms. The negative effect of divorce is consistent whether I adopt all non-divorce firms or matched non-divorce firms as control. Further research shows that marital conflict between the divorcing couple acts as one channel through which divorce hits firm performance.

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