Three Essays on Foundation Owned Firms in Germany

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Summary

This dissertation consists of three research papers on foundation owned firms in Germany, which are structured into three chapters. All chapters and their respective main research results are briefly summarized below.

There are several prominent examples of foundation owned firms, such as Aldi, Bosch, Lidl, ThyssenKrupp, and ZF Friedrichshafen. Foundation owned firms are firms that are fully or partially owned by a foundation. A foundation is a legal entity without owners that is set up by a founder. The founder transfers the founded assets to the foundation, and fixes the foundation charter which defines the purpose of the foundation. Basically, there are two types of foundations. Charitable foundations provide financial support for charitable projects. Family foundations support the founder's family. The impact of the beneficiaries of foundations on foundation owned firms is restricted in most cases. In particular, it is questionable who pushes the management for financial success of the firm. Thus, there is some room for agency conflicts due to the strict separation of ownership and control. According to standard agency theory, this is supposed to endanger the long-term survival of a foundation owned firm.

In the first chapter of the dissertation, co-authored with Günter Franke, we analyze firm policies and financial performance of foundation owned firms. We compare them to firms matched by industry and size in order to identify whether the foundation setup induces different policies and financial performance. In addition, we account for different foundation setups creating a lot of heterogeneity among foundation owned firms. We find that, relative to matching firms, foundation owned firms are much larger which seems to be due to a birth bias since only successful entrepreneurs usually set up a foundation. Employees appear to have a privileged position in foundation owned firms due to the power vacuum created by the absence of natural persons as residual claimants in most foundation owned firms.

As consequence, we observe more labor intensity in foundation owned firms, e.g., there seems to be less outsourcing. In addition, the financing policy of foundation owned firms is more conservative, measured by lower leverage levels and lower payout ratios. This seems to stabilize the long-term existence and, thus, creates more job security in foundation owned firms. The employees' benefits seem to come at the cost of lower financial performance, measured by the return on assets. On the other hand, the return on assets appears to be exposed to lower volatility in foundation owned firms. A measure for risk-adjusted financial performance, the Sharpe ratio, does not differ for foundation owned firms and matching firms. All the observed impacts are generally more pronounced for foundation owned firms with charitable foundations as owners, relative to family foundations. In any case, we find foundation owned firms to be clearly viable, in contrast to predictions from standard agency theory.

In the second chapter of the dissertation, co-authored with Phillip Heiler, we analyze return differences of foundation owned firms and firms that are not foundation owned. We attribute return differences to differences in firm policies. The choice of the relevant firm policies is based on the findings of the first chapter. There exist several studies, in particular in the field of labor economics, that decompose outcome variables into several components. These studies mainly analyze mean outcome differences. The decomposition method we use allows to make the analysis at different quantiles. In contrast to quantile regression, the effects of the analyzed variables add up to the overall return difference of foundation owned firms and firms that are not foundation owned in our study. In addition, the method accounts for nonlinear data generating processes. We discuss the problem of a potential simultaneity bias which is adherent when using accounting data. By the construction of the firm policy variables, we exploit persistence in order to mitigate this bias. Estimates can be interpreted as lower bounds for true effects, but the more persistent explanatory firm policy variables are, the closer the estimates get to the true effects.

Comparing the mean and quantiles of returns, we find pronounced return differences for the mean and high quantiles, where the returns of foundation owned firms are significantly lower. A substantial proportion of the observed return differences at several quantiles can be attributed to differences in firm policies. We find that lower

risk in foundation owned firms, as measured by the standard deviation of return on assets, increases the underperformance of foundation owned firms at high quantiles, but offsets it at low quantiles, a lower leverage of foundation owned firms offsets their underperformance at low quantiles and the median, higher labor intensity in foundation owned firms offsets their underperformance at low quantiles, the larger size of foundation owned firms increases their underperformance for the mean and all quantiles, lower operating revenue growth rates of foundation owned firms increase their underperformance at high quantiles, and residual differences beyond firm policies tend to be insignificant.

In the third chapter of this dissertation, I analyze the impact of varying intensities of the profit motive on firm policies and financial performance. While the first chapter deals with the comparison of for-profit foundation owned firms and other for-profit firms, I compare for-profit foundation owned firms to non-profit firms in the third chapter. By (legal) definition, the profit motive in non-profit firms is restricted due to the infeasibility to allocate net earnings to owners, managers, and directors. Instead, net earnings have to be spent for the firm's purpose. In contrast to other for-profit firms, the profit motive is weakened in for-profit foundation owned firms due to the fact that natural persons as owners are usually absent. However, I conjecture that the profit motive in for-profit foundation owned firms is not as restricted as in non-profit firms. I test several hypotheses performing an empirical analysis.

I find that, relative to for-profit foundation owned firms, non-profit firms have a lower leverage, operate more labor-intensively, and their financial performance, measured by the return on assets, is lower but also less volatile, still their risk-adjusted financial performance is lower. These findings may be attributed to two main channels arising from a reduced profit motive in non-profit firms. First, there are less rewards to managers of non-profit firms to make profits. Second, sponsors, the owners of non-profit firms, face higher reputational costs in the case of financial distress of non-profit firms due to non-profit firms being usually highly regarded in the public. These two channels seem to mitigate risk taking in non-profit firms lowering returns and the volatility of returns. A more conservative leverage also contributes to a more stable development of a firm. In addition, managers of non-profit firms might be averse to painful firings due to more public attention which might increase labor

intensity.

Deutsche Zusammenfassung

Diese Dissertation besteht aus drei Forschungspapieren über stiftungsgetragene Unternehmen in Deutschland. Die Thesis ist in drei Kapitel eingeteilt. Alle Kapitel und deren wichtigste Resultate werden im Folgenden kurz zusammengefasst.

Es gibt einige bekannte Beispiele für stiftungsgetragene Unternehmen, u.a. Aldi, Bosch, Lidl, ThyssenKrupp und ZF Friedrichshafen. Stiftungsgetragene Unternehmen gehören ganz oder teilweise einer Stiftung. Eine Stiftung ist eine juristische Person ohne Eigentümer, die von einem Stifter aufgesetzt wird. Der Stifter überträgt die gestifteten Vermögenswerte an die Stiftung und legt eine Stiftungssatzung fest, die den Zweck der Stiftung definiert. Grundsätzlich gibt es zwei verschiedene Arten von Stiftungen. Gemeinnützige Stiftungen unterstützen gemeinnützige Projekte finanziell. Familienstiftungen unterstützen die Familie des Stifters. Der Einfluss der Destinatäre der Stiftungen auf die stiftungsgetragenen Unternehmen ist in den meisten Fällen begrenzt. Besonders ist es fraglich, wer das Management antreibt, damit die Firma finanziell erfolgreich ist. Insofern besteht wegen der strikten Trennung von Eigentum und Kontrolle Potential für Agency-Konflikte. Nach der Standard-Agency-Theorie sollte dies das langfristige Überleben eines stiftungsgetragenen Unternehmens gefährden.

Im ersten Kapitel der Dissertation, das in gemeinsamer Forschungsarbeit mit Günter Franke entstanden ist, untersuchen wir verschiedene Aspekte der Firmenpolitik und die finanzielle Performance von stiftungsgetragenen Unternehmen. Wir vergleichen sie mit Firmen, die wir bezüglich Branche und Größe matchen, um herauszufinden, ob das Stiftungs-Setup unterschiedliche Firmenpolitik und finanzielle Performance induziert. Zusätzlich berücksichtigen wir verschiedene Stiftungs-Setups, die viel Heterogenität unter stiftungsgetragenen Unternehmen erzeugen. Wir entdecken, dass stiftungsgetragene Unternehmen viel größer sind als Vergleichsunternehmen, was wir auf einen Geburts-Bias zurückführen, da gewöhnlicherwiese nur erfolgreiche Unternehmer eine Stiftung aufsetzen. Arbeitnehmer scheinen eine privilegierte Stellung in stiftungsgetragenen Unternehmen zu haben wegen des Machtvakuums, ds dadurch entsteht, dass in den meisten stiftungsgetragenen Unternehmen natürliche Personen als Inhaber der Residualansprüche fehlen. Folglich beobachten wir mehr Arbeitsintensität in stiftungsgetragenen Unternehmen, z.B. scheinen sie weniger Produktion auszulagern. Zusätzlich ist die Finanzierungspolitik von stiftungsgetragenen Unternehmen konservativer, gemessen an niedrigeren Verschuldungsgraden und Ausschüttungsquoten. Das scheint die langfristige Existenz zu stabilisieren und erzeugt dadurch Arbeitsplatzsicherheit in stiftungsgetragenen Unternehmen. Die Vorteile der Arbeitnehmer scheinen zu Lasten der finanziellen Performance zu sein. Die Gesamtkapitalrendite ist niedriger in stiftungsgetragenen Unternehmen. Auf der anderen Seite ist sie weniger volatil. Die Sharpe Ratio, ein Maß für die risikoangepasste finanzielle Performance ist nicht verschieden für stiftungsgetragene Unternehmen und Vergleichsunternehmen. Alle beobachteten Einflüsse sind im allgemeinen stärker für stiftungsgetragene Unternehmen im Besitz einer gemeinnützigen Stiftung, im Vergleich zu einer Fa--milienstiftung. In jedem Fall beobachten wir, dass stiftungsgetragene Unternehmen klar überlebensfähig sind im Gegensatz zu Prognosen der Standard-Agency-Theorie.

Im zweiten Kapitel der Dissertation, das in gemeinsamer Forschungsarbeit mit Phillip Heiler entstanden ist, untersuchen wir Rendite-Unterschiede von stiftungsgetragenen Unternehmen und nicht-stiftungsgetragenen Unternehmen. Wir führen Rendite-Unterschiede auf Unterschiede der Firmenpolitik zurück. Die Auswahl der relevanten Firmenpolitiken basiert auf den Ergebnissen des ersten Kapitels. Es existieren einige Studien, v.a. im Bereich der Arbeitsmarktökonomik, in denen Outcome-Variablen in verschiedene Komponenten zerlegt werden. Diese Studien analysieren hauptsächlich Unterschiede der Durchschnitt-Outcomes. Mittels der Zerlegungsmethode, die wir verwenden, können wir die Effekte an verschiedenen Quantilen analysieren. Im Gegensatz zur Quantils-Regression addieren sich in unserer Studie die Effekte der analysierten Variablen zur Gesamt-Rendite-Differenz von stiftungsgetragenen Unternehmen und nicht-stiftungsgetragenen Unternehmen auf. Zusätzlich kann die Methode nichtlineare Prozesse berücksichtigen. Wir diskutieren das Problem eines potenziellen Simultaneity-Bias, der gewöhnlich ist, wenn man Buchhaltungsdaten verwendet. Durch die Konstruktion der Firmenpolitikvariablen nutzen wir Persistenz aus, um den Bias abzuschwächen. Schätzwerte können als untere Schranken für wahre Effekte interpretiert werden, aber je persistenter die Firmenpolitikvariablen sind, desto näher kommen die Schätzwerte den wahren Effekten.

Beim Vergleich der Renditen am Mittelwert und an den Quantilen beobachten wir starke Rendite-Unterschiede für den Mittelwert und für hohe Quantile, wo die Renditen der stiftungsgetragenen Unternehmen signifikant niedriger sind. Ein bedeutender Teil der beobachteten Rendite-Unterschiede an verschiedenen Quantilen kann Unterschieden in der Firmenpolitik zugemessen werden. Wir beobachten, dass geringeres Risiko in stiftungsgetragenen Unternehmen, gemessen an der Standardabweichung der Gesamtkapitalrendite, die Underperformance von stiftungsgetragenen Unternehmen an hohen Quantilen erhöht, aber an niedrigen Quantilen ihr entgegenwirkt. Niedrigere Verschuldung von stiftungsgetragenen Unternehmen wirkt der Underperformance an niedrigen Quantilen und dem Median entgegen. Höhere Arbeitsintensität wirkt der Underperformance an niedrigen Quantilen entgegen. Dass stiftungsgetragene Unternehmen größer sind, führt am Mittelwert und allen Quantilen dazu, dass deren Underperformance steigt. Geringere Wachstumsraten des Umsatzes von stiftungsgetragenen Unternehmen erhöhen die Underperformance an hohen Quantilen. Zusätzliche Unterschiede, fernab der Unterschiede der Firmenpolitik, scheinen unbedeutend zu sein.

Im dritten Kapitel der Dissertation untersuche ich den Einfluss unterschiedlicher Intensität des Gewinnmotivs auf Firmenpolitik und finanzielle Performance. Während das erste Kapitel den Vergleich von gewinnorientierten stiftungsgetragenen Unternehmen und anderen gewinnorientierten Unternehmen behandelt, vergleiche ich gewinnorientierte stiftungsgetragene Unternehmen und gemeinnützige Unternehmen (non-profit firms) im dritten Kapitel. Aufgrund der (rechtlichen) Definition ist das Gewinnmotiv in gemeinnützigen Unternehmen eingeschränkt wegen der Unzulässigkeit, den Reingewinn an Eigentümer, Manager und Aufsichtsratmitglieder zu verteilen. Stattdessen muss der Reingewinn für den Unternehmenszweck ausgegeben werden. Im Gegensatz zu anderen gewinnorientierten Unternehmen ist das Gewinnmotiv in gewinnorientierten stiftungsgetragenen Unternehmen abgeschwächt wegen der Tatsache, dass gewöhnlich keine natürliche Person Inhaberin der Residualansprüche ist. Jedoch mutmaße ich, dass das Gewinnmotiv in gewinnorientierten stiftungsgetragenen Unternehmen nicht so eingeschränkt ist wie in gemeinnützigen Unternehmen. Ich teste verschiedene Hypothesen, indem ich eine empirische Analyse durchführe.

Ich beobachte, dass im Vergleich zu gewinnorientierten stiftungsgetragenen Unternehmen gemeinnützige Unternehmen niedrigere Verschuldung haben, arbeitsintensiver operieren, eine niedrigere finanzielle Performance, gemessen an der Gesamtkapitalrendite, haben, aber diese auch weniger volatil ist; trotzdem ist ihre risikoangepasste finanzielle Performance niedriger. Diese Befunde können auf zwei Hauptkanäle, die das Resultat eines beschränkten Gewinnmotivs in gemeinnützigen Unternehmen sind, zurückgeführt werden. Erstens werden Manager gemeinnütziger Unternehmen weniger belohnt, wenn sie Gewinne erwirtschaften. Zweitens begegnen Träger, die Eigentümer von gemeinnützigen Unternehmen, höheren Reputations--kosten, wenn gemeinnützige Unternehmen in finanzielle Not kommen, weil gemeinnützige Unternehmen in der Öffentlichkeit gewöhnlich hoch angesehen sind. Diese zwei Kanäle scheinen das Eingehen von Risiken in gemeinnützigen Unternehmen zu reduzieren, was die Höhe der Renditen verringert, sowie deren Volatilität. Eine konservativere Verschuldung trägt auch zu einer stabileren Entwicklung des Unternehmens bei. Zusätzlich könnten Manager von gemeinnützigen Unternehmen abgeneigt gegenüber schmerzhaften Entlassungen sein wegen höherer öffentlicher Beachtung, was Arbeitsintensität erhöht.

Chapter 1

Foundation Owned Firms in Germany - Insights into Corporate Governance

1.1 Introduction

Over the last decades the discussion on corporate governance broadened; it now also includes the impact of socio-economic culture and legal systems. Yet, in all discussions owners of a firm play an important role in corporate governance as residual claimants. They push the firm's managers for profitability even though their power varies according to the legal setting and the costs and benefits of exercising control. If there are no residual claimants, then other stakeholders of the firm might extract pecuniary and non-pecuniary benefits from the firm instead of pursuing profitable long-term investments. This might endanger competitiveness of the firm and therefore its viability. Hence, it may appear paradoxical that there exist various small and big firms in Europe, in particular in Denmark and in Germany, which are partially or fully owned by a foundation. A foundation is a legal entity which has no owners (von Campenhausen and Richter (2014)). Therefore, natural persons being residual claimants in the firm may not exist. Big foundation owned firms in Germany include Bertelsmann, Bosch, Körber, ThyssenKrupp, ZF Friedrichshafen, Aldi, and Lidl. In Denmark, firms owned partially by a foundation, comprise a quarter of the largest 100 Danish corporations; their market value represents about half of the market value of the Danish stock index (Thomsen and Hansmann (2013)). Two important examples are Møller, the world's largest container shipping company, and Carlsberg Breweries, in Sweden IKEA.

Most foundations in Germany are charitable. They provide financial support for charitable purposes including hospitals, poor people, research, and ecological projects. In charitable foundations the beneficiaries have no formal impact on the foundation's policy. If such a foundation is the sole owner of a firm, then there may be nobody pressing the firm for high profits. Such a strict separation of ownership and control should lead to strong agency problems (Fama and Jensen (1983)). Also, capital market control is absent. This provides room for the employees and other stakeholders of the firm to pursue their own interests. A simplistic version of agency theory suggests that the financial performance of these firms should be inferior, they may not be viable in the long run. This simplistic version ignores the legal setting, other institutions of corporate governance, and the interaction between different stakeholder groups. These attributes of corporate governance possibly substitute for powerful residual claimants. While there are numerous studies on the impact of institutions on financial performance of firms (e.g., van Essen et al.

(2013)), it is still an open question which institutional settings motivate corporate policies that assure competitiveness and the long run existence of firms. The analysis of foundation owned firms can help to fill this theoretical gap. As financial performance is driven by various aspects of corporate policies, it is important to also analyze these drivers. Policies might be different even if financial performance is not.

The purpose of this paper is to analyze the policy and financial performance of foundation owned firms in Germany. Our sample includes 164 German non-financial firms which are partially or fully owned by a foundation. Most foundation owned firms (FoFs) originate from family firms. First, we compare FoFs to matching firms of similar size in the same industry which are not owned by foundations and mostly family owned/closely held. Second, we compare different subsets of FoFs, in particular firms owned by charitable foundations and firms owned by family foundations. A family foundation provides restricted financial support to the founder's family. The family often retains some rights to govern the foundation's policy and that of the FoF. Thus, the family partially retains the role of owners and constrains the influence of other stakeholders. All firms in our sample are for-profit, i.e., non-charitable. As most firms are not listed, we analyze annual statements of firms in the period 2003 to 2012.

The main findings of the paper can be summarized as follows. On average, FoFs are much larger than matching firms in terms of employees, operating revenue, and total assets. This is likely due to a birth bias. Usually, a successful entrepreneur sets up a foundation and transfers her ownership claims in a prospering firm to a foundation. Hence, FoFs tend to be fairly large at birth. Also, FoFs appear to be more labor-intensive and less raw material-intensive. FoFs may supply more services and more labor-intensive tangible products, they may be more vertically integrated, i.e., they may rely less on outsourcing parts of their production process which is common in many industries. Labor intensity appears to be particularly strong in firms with ownership of a charitable foundation. These findings suggest that, relative to matching firms, FoFs act more in the interest of their employees by creating and retaining jobs in the firm. But FoFs do not pay higher wages. Also, their hiring and firing policy, measured by the sensitivity of personnel expense to changes in operating revenue, is similar to that of matching firms.

The financing policy of FoFs is more conservative, stabilizing their long-term existence. Leverage tends to be lower than in matching firms. FoFs also appear to pay out less money to their owners. Return on assets is apparently somewhat smaller, regardless of whether charity or family foundations are owners. The median return on assets of FoFs is about 6.7 percent, compared to 7.5 percent of matching firms. This difference is fairly small. FoFs also tend to use less risky policies. A Sharpe ratio indicates that risk-adjusted financial performance of FoFs is not inferior.

German codetermination lowers returns on assets, similarly in FoFs and matching firms. Listing at a stock exchange appears to have a weakly negative impact on returns on assets of matching firms, but not of FoFs. Possibly, capital market control undermines long-term management as reported by He and Tian (2013) and thereby neutralizes positive listing effects. But in FoFs capital market control may partly substitute for the weakness of other residual claimants.

These findings cast serious doubts on the simplistic agency theory based view that firms without strong residual claimants do not thrive in the long run. But in line with agency theory, FoFs are clearly more labor-intensive, presumably driven by more powerful employees. This might also explain the somewhat weaker return on assets. But a privileged employee orientation apparently does not endanger the firms' existence. Some FoFs date from the 19th century. Governance mechanisms in FoFs apparently preserve long-term management.

We are not the first ones to look into these issues. Thomsen (1996) does not find inferior financial performance of Danish FoFs, relative to the largest Danish firms which are not foundation owned. Thomsen and Rose (2004) compare Danish FoFs with other Danish firms listed at a stock exchange while Thomsen and Hansmann (2013) compare them to firms with a traditional ownership structure. Both studies obtain the same result as Thomsen (1996). Hansmann and Thomsen (2013) find that greater managerial distance between the board of the foundation and that of the FoF improves financial performance.

In another early study Herrmann (1996) and Herrmann and Franke (2002) analyze a smaller sample of German FoFs over the years 1990 to 1992 with little differentiation between different types of foundations. Relative to other German firms listed at a stock exchange, they also find higher labor intensity, but lower salary levels in German FoFs. Financial performance of FoFs, however, is slightly better. This finding is not inconsistent with the findings of the current study since different benchmarks are used.

The paper is organized as follows. In the next section, we provide more details about the motives of founders of foundations and the regulation of foundations in Germany. Then, we derive some hypotheses on corporate policies of FoFs. The subsequent section shows descriptive statistics, and the following section presents our empirical findings. After discussing some robustness results, the paper concludes.

1.2 Institutional Background of Foundation Owned Firms

1.2.1 Motives for Setting up a Foundation

Usually, the founder transforms a family firm with a traditional ownership structure into an FoF to assure that the firm thrives ”forever”. Possibly, the entrepreneur feels grateful to her employees and wishes to preserve jobs for a long time. The foundation gets an ownership stake in the firm which usually cannot be sold. Motives of founders differ with regard to the beneficiaries of the foundation. Founders of a charitable foundation may wish to support society through funding charitable activities. Charitable foundations are tax-exempt. The founder can subtract donations to charity foundations from taxable income to a limited extent.

Founders of a family foundation may be afraid that changes in ownership due to heritage or conflicts between family members endanger the stability of the family firm. Also, descendants of founders may lack managerial expertise. To stabilize the firm, ownership claims may be transferred to a family foundation. It provides restricted financial support to the members of the founder’s family and, perhaps, other previous owners of the firm. The supported persons usually cannot sell their claims against the foundation. Conflicts between these persons may affect the foundation, but only to a lesser extent the FoF. The family foundation is not tax-exempt.

Another motive for setting up a foundation is regulatory arbitrage. A family firm may be set up as a partnership (Kommanditgesellschaft) in which at least one partner has unlimited liability. A foundation can take the position of an unlimited liability partner and thereby remove full liability of all natural persons. In our sample we have 14 family foundations which are fully liable partners in a partnership, but mostly have no equity stake, i.e., they cannot claim part of the firm's profit. Instead, these foundations get a fixed fee for management and for bearing the unlimited liability-risk. As a fully liable partner, the foundation is entitled to manage the firm. The members of the founder's family usually have some impact on the management of the foundation. The incentive for removing full liability of all natural persons may be particularly strong in firms with low profitability and high risk.

Another type of regulatory arbitrage relates to the German codetermination law. Firms with many employees are subject to codetermination. Aldi and Lidl, two very big retail store chains, have set up various small regional partnerships which own the supermarkets. The family foundations are similar to holding firms of the regional partnerships. Thereby, Aldi and Lidl bypass the codetermination law. The following table summarizes the different types of German foundations.

Table 1.1: Summary of German Foundation Types

Type of foundation	Founder's motives	Mechanism
Charitable foundation	Assure long-term existence of firm and support charitable projects	Foundation for stable ownership structure
Family foundation	Assure long-term existence of firm and support founder's family	Foundation for stable ownership structure
Managing partner-foundation	Remove unlimited liability of natural persons being partners	Foundation as unlimited partner
Holding company-foundation	Constrain power of employees	Foundation as holding firm to avoid codetermination

This table summarizes types of foundations and corresponding founder's motives and mechanisms.

1.2.2 Regulation of Foundations in Germany

Regulation of a foundation is mostly governed by the German state in which the foundation is domiciled. Setting up a foundation requires the founder to set up a foundation charter with many rules which specify the purpose of the foundation, restrict its activities, and prescribe how the foundation should be managed. Usually, it also contains rules about corporate governance of the FoF. The foundation charter has to be approved by the German federal state which registers the foundation. It is very difficult to change the charter once it has been approved by the state. Foundations are forced to preserve their capital. They must not pay money to beneficiaries if this undermines their initial capital, defined in real terms. The state usually does not interfere in the foundations' policies as long as the charter is observed.

The charter is an important and effective device for the founder to impose her will "forever" on the foundation and the FoF. The charter and the regulation should induce long-term orientation of the foundation managers which may induce long-term orientation of the supervisory body of the FoF. If this body appoints managers with a long-term orientation, then, it will be difficult for any stakeholder group to exploit the firm in the short/medium run.

1.3 Implications for Foundation Owned Firms

1.3.1 Family Firms: The Origin of FoFs

As FoFs mostly originate from family/closely held firms, we first discuss some properties of these firms. A successful entrepreneur may want to preserve her successful business model by setting up an FoF. Therefore, the corporate governance model of the FoF, as far as it is nailed down in the charter, likely inherits many features of the model existing previously in the firm. The role of owners in a family/closely held firm is controversial. Owners with a relational/stewardship attitude adopt a stakeholder orientation, while owners with an individualistic attitude maximize their private benefits (Bau and Chirico (2014), Bingham et al. (2011), Kallifatides et al. (2010). Jones et al. (2007) propose five different stakeholder cultures related to ethical considerations. This suggests that family firms pursue financial and non-financial goals. Empirically, Bau and Chirico (2014) and

Bingham et al. (2011) find a relational attitude in family firms which primarily benefits employees (see also Hillman and Keim (2001)). While family firms may suffer from tensions within the controlling family, from conflicts between the family and employees, and excessive valuation of socio-emotional wealth by family members, they may reduce agency problems, created by separation of ownership and control, and promote long-term oriented corporate governance instead of short-term financial performance. In their meta-analysis van Essen et al. (2015a), conclude that the performance of US family firms drops dramatically after the first generation so that then they are outperformed by public firms (similarly, Villalonga and Amit (2006)). They also find that listed family firms perform well when family members with large stakes monitor professional executives, and transparent and liquid capital markets assure effective monitoring of family owners[1].

Bezemer et al. (2015) argue that a stakeholder culture prevails in the Netherlands. This is also true in Germany. An important reason for the stakeholder culture in closely held firms could be the long-term presence of the owner-managers (Anderson and Reeb (2003)). In these firms other stakeholders are dealing with the same owner-managers for longer periods than in public firms, promoting stronger ties. Most matching firms in our sample are family/closely held firms.

1.3.2 Stakeholder versus Privileged Employee Orientation

The setup of FoFs may be endogenous in the sense that entrepreneurs with a strong employee orientation are inclined to perpetuate this orientation by changing their firms into FoFs. Therefore, this change need not strengthen the role of employees. But, possibly, the move to an FoF makes managers of the firm more powerful, in particular if the foundation's management is weak. This might translate into more power of employees. They are always present in the firm, their representatives often talk to managers. Other stakeholders (creditors, customers, suppliers) may actually lose some power if the role of the family is weakened by setting up an FoF. We conjecture that a weaker control of residual claimants translates into more employee control. FoFs may be managed with a stronger orientation on the interests of employees which we call "privileged employee orientation". Our hypotheses in this section compare corporate policies under the stakeholder and a privileged employee

[1] Lins et al. (2013) find that family firms, relative to other firms, are more conservative, invest less in a crisis, and their financial performance is lower. O'Boyle et al. (2012) find in their meta-analysis a slightly positive, insignificant performance effect of family involvement.

orientation.

Corporate governance under a privileged employee orientation depends on employee preferences. Employees are not only motivated extrinsically by money, but also intrinsically (Rebitzer and Taylor (2011)). The pleasure derived from strong individual performance on the job and the aspiration to contribute to intrinsically worthwhile goals may play a role as well as social rewards associated with the job. A critical question is whether employees pursue a short- or long-term perspective in their firm. In his analysis of the labor managed firm, Furubotn (1971) argues that the employees' time horizon depends, apart from their age, on their possibilities to extract money from the firm in the short- and medium-term and on their possibilities to earn money elsewhere. If creditors impose strong credit constraints, then, employees' possibilities to impose losses on creditors are restricted. This renders money extraction less attractive. Also, firm specific human capital of employees cannot be transferred to other jobs (Jensen and Meckling (1979)). Moreover, if job markets are characterized by high unemployment, then, employees may attach a high value to long-term job security. Therefore, employees' time horizon regarding their job is ambiguous. In the following, we derive some hypotheses for FoFs.

(1) Hypothesis 1 addresses potential employee benefits in FoFs. Raising the average income of employees indicates a short/medium-term orientation of employees because then, they extract more money from the firm which endangers its long run viability. Raising the number of jobs or making jobs safer indicates a long-term orientation of employees.

Hypothesis 1: Privileged employee orientation raises a) the average income of employees, b) the number of jobs, and c) makes jobs safer, relative to stakeholder orientation.

We briefly discuss mechanisms to raise the number of jobs and make jobs safer. Hypothesis 1b) states that the optimal number of jobs is higher under the privileged employee than under the stakeholder orientation. Alternatively, existing employees might want to maximize benefits per employee. That might prohibit new jobs. But firms need to hire young people to balance the age pyramid of employees. Also to be viable in a competitive environment, firms need to expand when there are new windows of opportunity. Presumably, employees then prefer to raise the number of jobs.

The number of jobs can be raised by various strategies. (i) Selling products is invariably combined with providing services to customers. The firm can put more weight on providing services and producing more labor-intensive products. Also, a firm may substitute labor (ii) for capital or (iii) for material. Consider the reverse substitution. A common approach to substitute capital for labor is to buy advanced labor-saving technical equipment. This may permit substantial cost cutting as illustrated by various stages of industrialization. Alternatively, outsourcing (vertical disintegration) is a typical approach to substitute material for labor. Since the eighties, many industrial firms use outsourcing to lower the overall cost and benefit from specialization of suppliers. While substitution of labor for capital lowers depreciation, substitution of labor for material lowers material expense. Both types of substitution would raise the number of jobs and might also strengthen job security.

The three strategies have different effects on accounting items. (i) Concentrating on labor-intensive products and services raises the firm's personnel expense, but may have little effects on depreciation and material expense. (ii) Substituting labor for capital should raise a firm's ratio "Personnel expense/depreciation". (iii) Substituting labor for material should raise the ratio "Personnel expense/material expense", but its effect on the ratio "Personnel expense/depreciation" depends on the used technology. Vertical integration[2] can have strong effects on accounting items and ratios: Merge two firms with subsequent production stages. Before the merger, each firm has its own material expense and its own operating revenue. As an approximation, the operating revenue of the firm with the first production stage equals the material expense of the firm with the second production stage. In the "consolidated annual statement" the material expense of the second firm is netted against the operating revenue of the first firm while personnel expenses are added. It can be shown that "Material expense/operating revenue" of the integrated firm is smaller than the average of these ratios of both firms before the merger. Similarly, "Personnel expense/operating revenue" of the integrated firm is higher than the average if labor intensity, measured by "Personnel expense/(operating revenue − material expense)", is the same for both firms before the merger. Hence, a high ratio "Personnel expense/operating revenue" does not always indicate low labor

[2]The CEO of the FoF "ZF Friedrichshafen", one of the biggest automotive suppliers worldwide, recently said that the firm is strongly vertically integrated (Müller (2015)).

productivity. It may be a pure ”accounting effect” of consolidation. It is dangerous to compare accounting figures of firms with different degrees of vertical integration.

Another look at the production and employment policy analyzes the long-term production function under the stakeholder and the privileged employee orientation. For simplicity, we assume that for a given portfolio of services and products the firm's production function can be approximated by a Cobb-Douglas function

$$ln\, OR = \alpha\, ln\, PE + \beta\, ln\, ME + \gamma\, ln\, DE + \delta\, ln\, OE \tag{1.1}$$

with OR = operating revenue, PE = personnel expense, ME = material expense, DE = depreciation, and OE = expenses for other production factors. α, β, γ, and δ are the elasticities of the operating revenue with respect to the production factors. These elasticities should add to $1, \alpha + \beta + \gamma + \delta = 1$.

To model the difference between stakeholder and privileged employee orientation, we assume that the firm maximizes a weighted average of operating revenue and personnel expense,

$$\kappa\, OR + (1 - \kappa)\, PE, \quad 0 < \kappa < 1.$$

The weight $(1 - \kappa)$, put on the personnel expense, is higher under the privileged employee than under the stakeholder orientation. The objective function is maximized with respect to PE, ME, DE, and OE, subject to the budget constraint $PE + ME + DE + OC = TC$. Assume the total production cost TC to be given. Then, a higher weight of the personnel expense lowers the optimal operating revenue and raises the optimal personnel expense and the elasticity of operating revenue with respect to personnel expense indicating higher labor intensity. The expenses for the other production factors and their corresponding elasticities go down. This follows from the optimization as shown in Appendix 1.A.

To implement this policy change, the firm has various options. It might retain its portfolio of services and products and accept the loss in operating revenue in exchange for higher labor intensity. But it might also change the portfolio composition towards more labor intensity to mitigate the loss in operating revenue and, thus, improve profitability. The optimization results motivate Hypothesis 2.

Hypothesis 2: Stronger employee orientation raises the elasticity of operating revenue with respect to personnel expense and the ratio "Personnel expense/operating revenue"; it lowers the elasticity of operating revenue with respect to material expense and the ratio "Material expense/operating revenue".

(iv) A fourth strategy to raise employment relates to core competences. Over the last decades, many firms streamlined their product portfolio to improve their competitiveness by focusing on core competences. This led to spin-offs and closures of product lines, the number of employees and operating revenue declined. With a privileged employee orientation, FoFs may abstain from such a policy. This might explain higher numbers of employees, higher operating revenue, and higher total assets. In other words, it might explain why FoFs tend to be larger than matching firms.

(2) Job security, addressed in Hypothesis 1c), can be strengthened through various channels including high profitability, a conservative financing policy, and firm growth. Internally driven operating revenue growth often requires more employees so that layoffs are remote. But more growth may also be associated with more risk.

(3) Next, consider financing policy. If the power of residual claimants is weakened in an FoF, then, creditors may have a stronger impact on corporate governance including financing policy. They also may be afraid of lower profitability raising the FoF's default risk. A lower leverage of the FoF might characterize an equilibrium with lower default risk and less power of creditors. This might be reinforced by a less risky investment policy. Hence, there would be more room for employee influence (see also Istaitieh and Rodriguez-Fernandez (2006)). Chen et al. (2012) find that firms with unionized workers (in which employee orientation is likely to be stronger) invest less risky and pay lower bond coupons than other firms. Croci et al. (2011) find that family firms (in which employee orientation tends to be stronger than in public firms) invest less risky and obtain more long-term debt. This suggests that a more conservative investment and financing policy benefits employees and creditors. High equity also reduces the need to react to losses by immediate cost cutting, including layoffs of employees. The alternative of raising new equity capital may not exist for FoFs because foundations often have small financial reserves so that they cannot provide new money. Hence, a conservative

financing policy should stabilize the firm and strengthen job security.

Hypothesis 3: Privileged employee orientation motivates a more conservative financing policy.

(4) If FoFs provide more benefits to employees than matching firms, these benefits likely are costly. Matching firms would also grant costless benefits, i.e., benefits which do not lower profits[3]. Hence, additional benefits due to privileged employee orientation should impair financial performance. The counterargument that ownership structure should not matter for financial performance (Demsetz and Villalonga (2001)) is based on a pure shareholder value approach: Profit maximizing shareholders choose the ownership structure so that it is endogenous and has no impact on financial performance. Given the very inflexible ownership structure in FoFs, the counterargument is likely invalid. This motivates

Hypothesis 4: Privileged employee orientation lowers financial performance.

Differences between stakeholder and privileged employee orientation are constrained by market control through competitive forces as argued by Fama (1980). An FoF has to offer goods and services at price and quality levels which are attractive to customers. Otherwise, the FoF will gradually decline and eventually fail.

1.3.3 Heterogeneity in Governance of FoFs

Even though all FoFs share properties relative to matching firms, there exists substantial heterogeneity among FoFs. First, consider an FoF where a charitable foundation is the single owner. Then, the lack of residual claimants may give much power to employees. Some counterbalance may be established by managers and by external directors who supervise the FoF. Their approach to corporate governance and their qualification are crucial. Sometimes, the supervisors are managers of other firms, sometimes retired CEOs of the FoF or other honorable persons. Even though these supervisors get some pay, this often appears to be modest. The expectation is that these persons are intrinsically motivated to act in the spirit of

[3]Hillman and Keim (2001) find that firms improving their relations with employees often raise shareholder value. Thus, a conflict between the stakeholder and the privileged employee approach need not exist.

the founder. Whether this expectation is justified in the long run, is doubtful.

Second, consider a family foundation. The charter often reserves some managerial power for the family, and, at the same time, may stabilize the quality of the firm's management by reserving top management positions to competent in- or outsiders. Since the family receives financial support from the foundation which is funded by the FoF, the family is likely to act in its own interest by constraining employee orientation in the FoF to a level which does not materially impair financial performance. Hence, we expect less employee orientation in firms owned by family foundations. This motivates

Hypothesis 5: Employee orientation is weaker in firms owned by family foundations than in those owned by charitable foundations.

Third, consider the case in which the foundation takes the role of the unlimited partner in a partnership. The founder and her family may still be powerful in the foundation. It is not obvious how this foundation setup affects corporate governance of the firm. Possibly, the removal of full liability of natural partners weakens their impact on governance. Alternatively, full liability of natural persons may overly constrain risk taking of the firm so that the new setup allows for a more successful corporate policy. Only the data can tell which effect is stronger.

1.4 Descriptive Statistics and Methods

1.4.1 Data

Fleschutz (2007) published a list of 419 German FoFs. This list includes for-profit- and not for-profit-firms. Also, parent companies and subsidiaries are included. Marc Eulerich from the University of Duisburg/Essen recently updated this list which now includes 740 firms. He was kind enough to provide us his new list which appears to be very carefully derived. In this paper, we only analyze for-profit-firms. We use a for profit-firm of the Eulerich list in our analysis only if certain requirements are satisfied. First, we exclude small FoFs. For all firms, the minimum annual operating revenue in the sampling period 2003 to 2012 is 380,000 EUR, minimum total assets are 49,000 EUR. Second, as FoFs operate in a broad range of industries, we need to compare them with suitable matching firms. These do not always exist.

For example, for the big discount chain stores Aldi and Lidl there are no matching firms. Therefore, we exclude these FoFs. We also exclude financial firms. Third, we only consider operating units as FoFs or matching firms, i.e., legal entities with operating revenues generated within this entity. Such an entity may be a subsidiary of another firm. Fourth, since we obtain the data of annual statements from Orbis, we exclude those FoFs for which Orbis does not provide (enough) data. These are mostly small FoFs as Orbis covers a very wide range of German firms.

Fifth, we include a firm as an FoF if a) the foundation has limited liability in the firm and has at least 2 percent of the voting rights or 2 percent of the equity stake (i.e., profit claims), or b) if the foundation is a partner in the firm with unlimited liability. Often, voting rights and equity stakes differ substantially. We obtain the foundation's share of equity stakes from Hoppenstedt, the share of voting rights from Orbis, as far as possible. In addition, we hand-collect data from public registers of annual statements and check them. Since there often exist pyramid structures of firms, we derive the effective shares of the foundation in the FoF (similar to Franks and Mayer (1997)). This leaves us with 164 for-profit-FoFs. Even though the number of FoFs may increase slightly over time, due to the setup of new foundations, our sample is representative for Germany. As Germany and Denmark are the European countries with most FoFs, and Danish FoFs are intensively analyzed by Steen Thomsen, German FoFs appear particularly suitable to broaden our knowledge about corporate governance.

Since only 21 FoFs are listed, we only use accounting data. Sometimes total assets and/or operating revenue of a firm change dramatically from one year to the next. This can be due to mergers or split-offs, but also due to data errors. Whenever in a time series of total assets, operating revenue, or number of employees we see a decline of more than 50 percent or an increase of more than 100 percent from one year to the next for the same firm, we only use the data starting after the dramatic change. This implies that for this firm each time series covers less than 10 years. This also happens if Orbis does not provide data for all 10 years. We winsorize data at the 1 percent- and at the 99 percent-quantile to avoid extreme outliers. To eliminate inflation effects, all accounting numbers are deflated to the 2003-price level using the Eurostat BIP-deflator for Germany.

German matching firms are also taken from Orbis. As in other papers (for example Strebulaev and Yang (2013)), for each FoF we select matching firms by industry and size. We use two digit US SIC codes for industry classification. But whenever there are more than 100,000 German firms in a two digit US SIC industry, we use the three digit US SIC codes for a finer classification. Size is measured by operating revenue or by total assets if operating revenue is not reported by Orbis. Both numbers are correlated with 0.945. If possible, we select for each FoF five matching firms of the same industry which are closest in size. Our sample contains 757 matching firms. Hence, on average, for every FoF we use 4.6 matching firms. By using several matching firms, we try to neutralize idiosyncrasies of single matching firms. The disadvantage of using so many matching firms is that the average size difference between the FoFs and the matching firms increases.

21 of the 164 FoFs are listed which is about 1/8. Among the 757 matching firms 89 are listed, slightly less than 1/8. As documented by Franks and Mayer (1997), there are only few firms in Germany without a blockholder. Even though this has changed to some extent in the last 15 years due to changes in tax laws, it is still typical. Hence, most matching firms are family/closely held firms.

1.4.2 Descriptive Statistics

1.4.2.1 Summary Statistics

Descriptive statistics of various accounting numbers of our sample of German FoFs are shown in the upper part of Table 1.2. For each firm, we use the time series of its accounting numbers and then take averages for descriptive statistics. The 164 FoFs can be split into 14 FoFs where the foundation has full liability (also counted as having all voting rights) and 150 FoFs where the foundation has limited liability. In 105 cases the foundation with an ownership stake is charitable, in 55 cases non-charitable. In 4 cases a charitable foundation and a non-charitable family foundation share ownership in an FoF. These cases are excluded when we analyze FoFs related to either a charitable or a non-charitable foundation. The foundation has the majority of votes in 112 cases, it owns the majority of equity claims in 84 cases.

Table 1.2: Summary Statistics

	all FoFs	Charity-owned FoFs		Full liability FoFs		vote share		equity share	
		no	yes	no	yes	≤0.5	>0.5	≤0.5	>0.5
Number of firms	164	55	105	150	14	52	112	80	84

FoFs	# of obs	Mean	Median	25%-quantile	75%-quantile
∅ Total assets (mill EUR)					
FoFs	164	1070	81	21	458
Matching firms	757	451	52	16	181
∅ Operating revenue (mill EUR)					
FoFs	151	1200	151	50	730
Matching firms	531	532	109	34	311
∅ Number of Employees					
FoFs	164	5588	624	171	3156
Matching firms	757	2050	320	106	1093
FoF-vote	164	0.699	0.944	0.316	1.000
FoF-equity stake	164	0.542	0.565	0.063	1.000

Summary statistics for foundation owned firms (FoFs) and matching firms. Charity-owned FoFs are FoFs with ownership by a charitable foundation, no-charity-owned FoFs are FoFs with ownership by a family foundation. Full liability FoFs are FoFs with unlimited liability of the foundation. Vote share [equity share] refers to the vote share [equity share] of the foundation in the FoF. In the lower part of the table, descriptive statistics for average total assets, average operating revenue, and average number of employees across firms are shown. For each firm an average number (∅) is a simple average of its numbers within the sampling period.

The lower part of Table 1.2 shows that total assets, operating revenue, and the number of employees are much higher in FoFs relative to matching firms. The frequency distributions of these numbers are strongly skewed to the right. Several reasons may explain the larger size of FoFs. First, a successful entrepreneur is more likely to transform her firm into an FoF than an unsuccessful entrepreneur. Successful firms likely have an above average-market share in their products and services markets. Hence, we expect a ”birth-bias” towards large FoFs. Second, if the entrepreneur has a strong employee orientation already before the setup of a foundation, then, her firm would employ more people. This would reinforce the ”birth-bias”. If the FoF continues this policy, then, it should stay large. But, in ”chemicals/rubber/plastics”, ”gas/electricity”, and ”other services”, the median operating revenue of FoFs is lower than that of matching firms. Thus, FoFs are smaller than matching firms in these few industries.

1.4.2.2 Production and Employment Policy

To better understand differences in the production and employment policies of FoFs and matching firms, we look at various accounting items and ratios. For each firm an average ratio a/b is a simple average of its annual ratios. As the frequency distributions of these ratios are sometimes strongly skewed, we present the medians of these averages for FoFs and matching firms and check the significance of the median difference by the Pearson chi-squared-test. To facilitate reading, we only report the ratio of the median of the FoFs, divided by the median of the matching firms. Hence, a ratio of more than 100 percent indicates a lower median of the matching firms. The ratios are shown for all FoFs and for different binary subgroups. First, we distinguish FoFs where the foundation has at least 50 percent of voting rights (Majority vote, yes) or not (Majority vote, no). Second, we distinguish FoFs where the foundation has at least 50 percent of the financial equity claims (Majority equity, yes) or not (Majority equity, no). Third, we distinguish FoFs where the foundation is charitable (Charity-owned, yes) or not, i.e., a family foundation (Charity-owned, no). Finally, we distinguish FoFs where the foundation is a partner with unlimited liability (Full liability, yes) or not (Full liability, no). The full liability FoFs are a subset of the FoFs with ownership of a family foundation. All FoFs are for-profit firms, irrespective of ownership.

Table 1.3: Descriptive Statistics

	Full sample of FoFs	Majority vote FoFs		Majority equity stake FoFs		Charity-owned FoFs		Full liability FoFs	
		no	yes	no	yes	no	yes	no	yes
∅ Number of employees	1.95***	1.88*	2.03***	2.06**	1.76**	1.48	2.08**	1.91***	2.39
∅ Income of employees	1.00	0.99	1.00	0.99	1.00	1.03	0.98	1.00	0.87
∅ Pers. expense/operating rev.	1.31***	1.11	1.38***	1.22**	1.34***	1.39***	1.22***	1.30***	1.24
∅ Mat. expense/operating rev.	0.79***	0.87	0.74***	0.84	0.77***	0.83	0.72***	0.80***	0.67
∅ Pers. expense/mat. expense	1.73***	1.35	1.98***	1.73*	1.89***	1.59	1.67***	1.70***	2.16
∅ Shareh. funds/total assets	1.19**	1.17*	1.23	1.10	1.33**	1.03	1.23***	1.22***	0.90
∅ Return on assets	0.89	0.79	0.94	0.86	0.95	0.99	0.86**	0.88	1.33
∅ Return on equity	0.76***	0.72***	0.77***	0.72***	0.79**	0.77	0.74***	0.76***	0.73
∅ Return on sales	1.08	1.13	1.02	1.08	1.08	0.89	1.03	1.07	1.19

This table shows ratios (FoFs/matching firms) for various numbers based on annual reports of firms. A ratio is the FoF-median divided by the median of the matching firms. Ratios are shown for the full sample of FoFs and for binary subgroups of FoFs. The table lists the ratios of the medians of firms' average (∅) number of employees, firms' average (∅) income of employees, firms' average (∅) of personnel expense/operating revenue, firms' average (∅) of material expense/operating revenue, firms' average (∅) of personnel expense/material expense, firms' average (∅) of shareholder funds/total assets, firms' average (∅) of return on assets (=EBIT/total assets TA), firms' average (∅) of return on equity (=EBT/shareholder funds), and firms' average (∅) of return on sales (EBT/operating revenue). Stars indicate whether the difference in medians is significant. ⋆, ⋆⋆, ⋆⋆⋆ indicate statistical significance at the 10%, 5%, and 1% level, resp.

The first line in Table 1.3 shows that FoFs employ on average about twice as many people as matching firms. The difference in medians is strongly significant supporting Hypothesis 1b). This also holds for all subgroups of FoFs, except for no-charity-owned FoFs and the subset of full liability FoFs. This supports a weaker employee orientation of FoFs with ownership of a family foundation (Hypothesis 5).

The average income of employees (= personnel expense/number of employees), shown in the second line of Table 1.3, appears to be very similar for FoFs and matching firms falsifying Hypothesis 1a). Apparently, employees do not exploit FoFs through higher income. Therefore, we do not use average income in our regressions later on.

Hypothesis 2 states that the ratio ”Personnel expense/operating revenue” should be higher for FoFs, while the ratio ”Material expense/operating revenue” should be lower. The 3rd and the 4th line of Table 1.3 support this hypothesis. The differences in medians are strongly significant for all FoFs and for most subgroups, except for no-majority vote FoFs, no-charity-owned FoFs and full liability FoFs. Not surprisingly, ”Personnel expense/material expense” should be even higher for FoFs relative to matching firms. This is clearly confirmed by the 5th line in Table 1.3.

We also check the ratio ”Personnel expense/depreciation” (not shown). Orbis always reports the sum of depreciation and amortization under the heading ”depreciation”. Differences in medians of FoFs and matching firms are always insignificant. Hence, FoFs appear to use more labor relative to material, but not relative to capital.

1.4.2.3 Financing Policy and Financial Performance

The last four lines in Table 1.3 portray the financing policy and financial performance. ”Shareholder funds/total assets” is higher in FoFs relative to matching firms, except for full liability FoFs. Significance of differences in medians is mixed. Financing policy appears to be more conservative in FoFs, in particular when the foundation is charitable, in line with Hypothesis 5. We also check the ratio ”Cash flow/(total assets − shareholder funds)”. Cash flow is defined as net income plus depreciation including amortization. As both ratios of capital structure provide a similar answer, we do not report results for the second ratio. Both ratios support Hypothesis 3.

One might assume that, due to a lower leverage of FoFs relative to matching firms, FoFs pay lower average interest rates on bank debt and other long-term debt. This is, however, not supported by the frequency distribution of the average paid interest rates. They are basically the same for FoFs and matching firms (not shown). This suggests that creditors are only ready to provide credit to FoFs at "normal" interest rates if FoFs protect creditors through a lower leverage. This may be explained also by the restricted possibilities of FoFs to raise new equity capital. In interviews 95 percent of FoF-managers confirmed this disadvantage. 24 percent considered it a strong disadvantage (Institut für Demoskopie (2012)).

If employees extract more costly benefits from FoFs, then, one would expect weaker financial performance of FoFs. The last three lines in Table 1.3 show our findings for "Return on assets", "Return on equity", and "Return on sales". To derive the return on assets, we take EBIT from Orbis. This is defined as operating profit/loss, excluding financial profit/loss, extraordinary expenses and revenues, and income taxes. The median return on assets is lower for all FoFs (6.7 percent) than for matching firms (7.5 percent) and also for all subgroups except for full liability FoFs. But the difference in medians is significant only for charity-owned FoFs. Thus, there is weak evidence that, apart from full liability FoFs, FoFs earn lower returns on assets than matching firms (Hypothesis 4).

The picture looks quite different for the return on equity, defined as EBT/equity capital. EBT is EBIT +/− financial profit/loss. Now, all FoFs as well as all subgroups of FoFs have clearly lower returns than matching firms. The explanation is that, apart from full liability FoFs, most FoFs have relatively more equity capital. The differences in medians are significant except for no-charity-owned FoFs and the subset of full liability FoFs. "Return on sales" again provides a different picture. The median is insignificantly higher for all FoFs and all subgroups except for no-charity-owned FoFs. This is presumably explained by many FoFs whose operating revenues are condensed by more vertical integration.

1.4.3 Methods

Next, we use regression analysis to get deeper insights into differences between FoFs and matching firms. Panel regressions with firm fixed effects capture time-invariant heterogeneity of firms. As there is much heterogeneity among firms, firm fixed effects are essential. Random effects are infeasible because the residuals strongly correlate with explanatory variables (Hausman-test).

We use firm fixed effects regressions in two ways. A) When we analyze Cobb-Douglas functions and the hiring and firing policy of firms, we are primarily interested in sensitivities to certain explanatory variables. We estimate the sensitivities separately for FoFs and matching firms and check whether these sensitivities are significantly different. If they are, then, this indicates different policies. B) In all other cases, we follow a two step-procedure. First, we panel-regress some variable on explanatory variables to estimate the fixed effects for FoFs and for matching firms. We also run this regression with different sensitivities for FoFs and matching firms. As the sensitivities never differ significantly, we estimate the firm fixed effects from the regression with unique sensitivities for all firms. Second, we OLS-regress the firm fixed effects on a dummy variable for FoFs and other time-invariant explanatory variables, including industry dummies. This permits us to find out whether the firm fixed effects are significantly higher/lower for FoFs than for matching firms. As there exists an error in variables-problem for the firm fixed effects, one would like to adjust for that in the second regression. A way around this problem is the Hausman-Taylor method (Hausman and Taylor (1981)). It requires suitable instrumental variables. These are difficult to find in our setting. Therefore, we follow Lewis and Linzer (2005) who conclude: "Indeed, OLS with robust standard errors is probably the best approach, except when information about the sampling in the dependent variable is not only available, but highly reliable" (p. 363). For large samples they suggest to use White standards errors, correcting for heteroscedasticity. We do this.

Analyzing corporate policies always faces endogeneity issues. As the management decides about corporate policy, it has a strong impact on most accounting numbers so that they are not independent. Hence, empirical estimates may be biased by endogeneity. This holds for FoFs and for matching firms. Our premise is that the estimated differences between both types of firms are robust to these biases. This premise is difficult to test. Robustness checks mitigate this problem.

1.5 Regression Analysis

1.5.1 Production and Employment Policy

1.5.1.1 Cobb-Douglas Function

To analyze production and employment policy, we use panel regressions to estimate the Cobb-Douglas function for FoFs and for matching firms[4]. As regressors we use personnel and material expense, and depreciation. Even though it is common to estimate translog-production functions with linear and quadratic terms, we only use linear terms because we are interested in the elasticities of operating revenue with respect to these expenses.

The first column of Table 1.4 shows the elasticities estimated separately for all FoFs and for their matching firms, and the differences between these elasticities. The elasticities for personnel expense, material expense, and depreciation add up to about 0.96 for the FoFs, and to 0.66 for the matching firms. The elasticity for personnel expense is more than twice as high for FoFs than for matching firms, the difference is significant. The elasticity for material expense is insignificantly lower for FoFs. The elasticities for depreciation are quite small and not significantly different. Apparently, FoFs are much more labor-intensive (Hypothesis 2). The strong difference in personnel expense-elasticities and the weak difference in material expense-elasticities suggest that - to a limited extent - FoFs substitute labor for material, but that FoFs also focus more on services and on more labor-intensive products than matching firms. Substitution of labor for capital in FoFs is not supported.

[4] The explanatory power of a regression is given by "within R squared". Consider a panel regression $y_{i,t} = a + \beta\, x_{i,t} + v_i + \varepsilon_{i,t}$ where v_i is the fixed effect of firm i. Let y_i and x_i be the means over time. Then, $(y_{i,t} - y_i) = \beta(x_{i,t} - x_i) + \varepsilon_{i,t}$. The within R squared denotes the variance of $\hat{\beta}(x_{i,t} - x_i)$, divided by the variance of $(y_{i,t} - y_i)$. This measure excludes the contribution of the estimated firm fixed effects to explaining the variance of y.

Table 1.4: Cobb-Douglas Function

ln OR	All FoFs	Lim Liability FoFs	No-Charity-owned FoFs	Charity-owned FoFs
ln PE				
mat	0.202**	0.229**	0.217***	0.258*
FoF	0.574***	0.573***	0.399***	0.729***
difference	0.372**	0.344*	0.182	0.471**
ln ME				
mat	0.427***	0.406***	0.585***	0.344***
FoF	0.345**	0.340**	0.561***	0.189
difference	−0.082	−0.066	−0.024	−0.155
ln DE				
mat	0.033**	0.024	0.029*	0.037
FoF	0.040	0.044	0.036	0.009
difference	0.007	0.020	0.013	−0.028
within R^2	0.6869	0.6798	0.8135	0.6622
# of obs	5052	4557	1802	3148

This table shows the results of panel regressions estimating the Cobb-Douglas function $ln\ OR_{i,t} = \alpha\ lnPE_{i,t} + \beta\ ln\ ME_{i,t} + \gamma\ DE_{i,t} + v_i + \varepsilon_{i,t}$. PE is the personnel expense, ME the material expense, and DE depreciation. v_i is the fixed effect for firm i. The coefficients are estimated separately for matching firms (mat) and for FoFs. Difference is "coefficient for FoFs − coefficient for matching firms", with asterisks indicating significance. The first column includes all FoFs and their matching firms, the other columns include only subsets of FoFs and their matching firms. Year dummies and regression constants are included, but not shown. Standard errors are adjusted for clustering (firm) effects and heteroscedasticity. $\star$, $\star\star$, $\star\star\star$ indicate statistical significance at the 10%, 5%, and 1% level, resp.

The second regression in Table 1.4 excludes full liability FoFs and their corresponding matching firms. The findings are similar. The third and the fourth column show the results for no-charity-owned and charity-owned FoFs, respectively. Again, the qualitative results are similar to "all FoFs". But the elasticity differences are much stronger for FoFs owned by charitable than those owned by family foundations, in line with Hypothesis 5.

1.5.1.2 A Simple Test of Labor Intensity

The ratio ”Personnel expense/material expense” should increase with labor intensity and, thus, be higher in FoFs. Here, we use a two step-procedure. In the first step, we regress the ratio on the operating revenue, on leverage, and on leverage squared to estimate firm fixed effects. Leverage is defined as (1 − shareholder funds/total assets). We include leverage in the first step because it might be relevant for job security. In the second step, we OLS-regress the firm fixed effects on various FoF-characteristics. The results in Table 1.5 suggest that labor intensity, measured by ”Personnel expense/material expense”, is stronger in smaller firms. In larger firms, economies of scope may mitigate concentration on services and labor-intensive products, also outsourcing may be less profitable. Leverage turns out to be insignificant.

Table 1.5: Analysis of the ”Personnel expense/material expense”-ratio (PPM) - First Step

PPM	Regression coefficients
ln OR	$-0.558^{\star}$
lev	-0.048
lev^2	0.085
within R^2	0.0097
# of obs	5378

This table displays the results of the panel regression $PPM_{i,t} = a + b \ln \text{OR}_{i,t} + c\,\text{lev}_{i,t} + d\,\text{lev}^2_{i,t} + v_i + \varepsilon_{i,t}$. v_i is the fixed effect for firm i. $lev_{i,t}$ is (1 − shareholder funds/total assets) of firm i in year t. Year dummies and regression constants are included, but not shown. Standard errors are adjusted for clustering (firm) effects and heteroscedasticity. $\star$, $\star\star$, $\star\star\star$ indicate statistical significance at the 10%, 5%, and 1% level, resp.

Table 1.6: Analysis of the "Personnel expense/material expense"-ratio (PPM) - Second Step

Firm fixed effects	Regression Coefficients				
FoF	1.301***	-	-	2.401*	1.879**
no-char FoF	-	0.689	-	-	-
char FoF	-	1.639**	-	-	-
difference	-	−0.950	-	-	-
lim liab FoF	-	-	1.276**	-	-
full liab FoF	-	-	1.557	-	-
difference	-	-	−0.281	-	-
FoF × vote share	-	-	-	−1.540	-
FoF × equity share	-	-	-	-	−1.041
adj R^2	0.2152	0.2161	0.2142	0.2165	0.2155
# of obs	778	761	778	778	778

This table displays OLS-regressions of firm fixed effects v_i, derived in Table 1.5. FoF, no-char FoF (= no-charity-owned FoF), char FoF (= charity-owned FoF), lim liab FoF (= limited liability FoF), and full liab FoF (= unlimited liability FoF) are dummies which are equal to 1 if a firm is of that type, 0 otherwise. FoF × vote share and FoF × equity share are interaction variables of the FoF-dummy and the foundation's vote share resp. the equity share in the FoF. "Difference" is the difference between the two sensitivities above in the same column, with asterisks indicating significance. Industry dummies and regression constants are included, but not shown. Significance is based on White standard errors correcting for heteroscedasticity. $\star$, $\star\star$, $\star\star\star$ indicate statistical significance at the 10%, 5%, and 1% level, resp.

In the first OLS-regression of the firm fixed effects (Table 1.6), the FoF-dummy (which is 1 for an FoF and 0 otherwise) has a strongly significant positive coefficient indicating that labor intensity is clearly higher in FoFs than in matching firms. In the next regression, the coefficient for charity-owned FoFs is significant and more than twice than that for no-charity-owned FoFs. But their difference is insignificant. For limited liability FoFs the coefficient is also significantly positive. The very high coefficient for full liability FoFs is insignificant, perhaps due to the small number of these FoFs. Again, the difference in coefficients is not significant.

In the last two regressions, we include the FoF-dummy and the interaction variables "FoF-dummy × vote share of the foundation" or "FoF-dummy × equity share of the foundation". We still find a significantly positive coefficient for the FoF-dummy, but the interaction terms are insignificant. Overall, these regressions support Hypothesis 2 that FoFs are more labor-intensive than matching firms. This appears to be particularly strong in charity-owned FoFs, supporting Hypothesis 5.

1.5.1.3 Hiring and Firing Policy

Job security is likely important for most employees. Therefore, we next analyze hiring and firing policies. Orbis shows the annual numbers of employees of firms and, thus, annual changes in these numbers, i.e., fluctuation. It is composed of employee motivated fluctuation (employees leave because of retirement or other personal reasons) and firm driven fluctuation (the firm hires and fires employees). Since firms do not publish information on motives for fluctuation, we relate fluctuation to changes in operating revenue, presumably the most important driver apart from mergers, acquisitions, and spin-offs. We measure fluctuation by annual relative changes in personnel expense or in the number of employees. As firms may react differently to positive and negative relative changes in operating revenue, we estimate the sensitivities separately for positive and negative changes. The first panel regression is

$$\mathrm{PE}_{i,t}/\mathrm{PE}_{i,t-1} = a + b\, OR^{+}_{i,t} + c\, OR^{-}_{i,t} + v_i + \text{year dummies} + \varepsilon_{i,t} \qquad (1.2)$$

with $OR^{+}_{i,t} := max\,(\mathrm{OR}_{i,t}/\mathrm{OR}_{i,t-1} - 1, 0)$ and $\mathrm{OR}^{-}_{i,t} := min\,(\mathrm{OR}_{i,t}/\mathrm{OR}_{i,t-1} - 1, 0)$. $\mathrm{PE}_{i,t}$ and $\mathrm{OR}_{i,t}$ are the personnel expense and the operating revenue of firm i in year t. v_i is the fixed effect for firm i. In regression (1.2) personnel expense growth is assumed to be equally sensitive to small and large changes in OR. This may not be true. Therefore, we run a second regression where we only include annual changes in OR of at least 10 percent. As personnel expense can change without hiring and firing people, we also run the same regressions replacing personnel expense by the number of employees.

Table 1.7: Hiring and Firing Policy - All Annual Changes in Operating Revenue

PE_t/PE_{t-1}	Coefficients	differences	EMP_t/EMP_{t-1}	Coefficients	differences
OR_t^+			OR_t^+		
mat	0.409***	-0.050;-0.228**	mat	0.155***	-0.021; 0.146
lim liab	0.359***	-0.178	lim liab	0.134*	0.167
full liab	0.181		full liab	0.301***	
OR_t^-			OR_t^-		
mat	0.270***	0.007; 0.297***	mat	0.142***	0.078; 0.129
lim liab	0.277***	0.290**	lim liab	0.220**	0.051
full liab	0.567***		full liab	0.271***	
within R^2	0.2895		within R^2	0.0764	
# of obs	5346		# of obs	4822	

This table shows the results of panel regressions with firm fixed effects estimating hiring and firing policy. It shows the results for equation (1.2), based on all annual changes in OR. Sensitivities are estimated separately for matching firms (mat), limited liability FoFs (lim liab), and full liability FoFs (full liab). On the left hand side, PE_t/PE_{t-1} is the dependent variable, on the right hand side it is EMP_t/EMP_{t-1}. PE is personnel expense, EMP the number of employees. Year dummies and regression constants are included, but not shown. "Differences" are differences between coefficients of the same regressor, with asterisks indicating significance. They are presented like in a covariance matrix. The first difference is that between mat and lim liab, the second is that between mat and full liab, and in the line below the third is that between lim liab and full liab. Standard errors are adjusted for clustering (firm) effects and heteroscedasticity. $\star$, $\star\star$, $\star\star\star$ indicate statistical significance at the 10%, 5%, and 1% level, resp.

Table 1.8: Hiring and Firing Policy - Annual Changes in Operating Revenue of at least 10 Percent

PE_t/PE_{t-1}	Coefficients	differences	EMP_t/EMP_{t-1}	Coefficients	differences
OR_t^{++}			OR_t^{++}		
mat	0.485***	-0.080;-0.381**	mat	0.176***	-0.017; 0.085
lim liab	0.405***	-0.301*	lim liab	0.159*	0.102
full liab	0.104		full liab	0.261*	
OR_t^{--}			OR_t^{--}		
mat	0.442***	0.005; 0.320***	mat	0.213***	0.106; 0.238**
lim liab	0.447***	0.315*	lim liab	0.319***	0.132
full liab	0.762***		full liab	0.451***	
within R^2	0.2764		withinR^2	0.0693	
# of obs	5346		# of obs	4822	

This table shows the results of panel regressions with firm fixed effects estimating hiring and firing policy. It shows the results for equation (1.2), based on annual changes in OR of at least 10 percent. Sensitivities are estimated separately for matching firms (mat), limited liability FoFs (lim liab), and full liability FoFs (full liab). On the left hand side, PE_t/PE_{t-1} is the dependent variable, on the right hand side, it is EMP_t/EMP_{t-1}. PE is personnel expense, EMP the number of employees. Year dummies and regression constants are included, but not shown. "Differences" are differences between coefficients of the same regressor, with asterisks indicating significance. They are presented like in a covariance matrix. The first difference is that between mat and lim liab, the second is that between mat and full liab, and in the line below the third is that between lim liab and full liab. Standard errors are adjusted for clustering (firm) effects and heteroscedasticity. $\star$, $\star\star$, $\star\star\star$ indicate statistical significance at the 10%, 5%, and 1% level, resp.

Table 1.7 reports the findings for equation (1.2), Table 1.8 for the same equation, but annual changes in OR of at least 10 percent only. In each table, the left hand side analyzes personnel expense, the right hand side the number of employees. We estimate the regression coefficients separately for matching firms, limited liability FoFs, and full liability FoFs. The tables also show the differences between the coefficients and their significance levels. Table 1.7, left hand side, shows that the sensitivity of personnel expense growth to positive operating revenue growth is similar for limited liability FoFs and matching firms, but very weak for full liability FoFs. The sensitivity to negative OR growth is again similar for matching firms and limited liability FoFs, but significantly stronger for full liability FoFs. They appear to react much stronger by cutting personnel expense, perhaps because their leverage ratio, relative to matching firms, is highest (Table 1.3). A higher leverage indicates lower financial reserves which may induce faster cost cutting in times of declining operating revenue. Considering only operating revenue changes of at least 10 percent (Table 1.8), all significant effects are stronger relative to those for equation (1.2). All firms appear to react harsher to stronger OR changes.

The right hand side of Table 1.7 and Table 1.8 confirms the results, using the number of employees instead of personnel expense. Employment reacts weaker than personnel expense to operating revenue, except for full liability FoFs. This indicates that firms use flexibility in working hours through working time accounts to accommodate changes in operating revenue before they hire or fire people. Differences in sensitivities are insignificant.

When we distinguish between matching firms, charity-owned FoFs, and no-charity-owned FoFs, the estimated sensitivities for these groups are not significantly different (not shown). This falsifies Hypotheses 1c) and 5. Summarizing, our findings do not support the conjecture that FoFs follow a more lenient hiring and firing policy.

1.5.2 Income of Top Managers

As there are no significant differences in average income of employees between FoFs and matching firms, we ignore this income in our regressions. However, in FoFs top managers might earn a higher income as they may be more powerful. Therefore, we check the total income and the per capita income of management boards in FoFs and matching firms. The German commercial code requires corporations to publish these numbers, unless the management board has only one member or the corporation is small. We have the data for 55 FoFs and for 192 matching firms. The median of the average number of board members over the sampling period is 4 for FoFs and 3.5 for matching firms. This indicates that the board is slightly larger in FoFs, even though FoFs tend to be much larger.

We first panel-regress total income of board members and their per capita-income on ln OR, EBIT, and leverage to derive firm fixed effects. In the second step, we OLS-regress these fixed effects on the FoF dummy, various FoF characteristics, industry dummies, and the IFRS-dummy. This dummy is 1 if the firm uses IFRS for its annual reports and 0 if the firm uses German accounting principles[5]. The FoF-dummy is positive with a p-value of 0.092 for total board income, but completely insignificant for per capita income. Other FoF-characteristics are also completely insignificant. Thus, we find no evidence for entrenchment of boards in FoFs. For brevity, these regressions are not shown.

1.5.3 Payout Policy

Next, we compare the payout policy of FoFs and matching firms. Apart from a lower leverage, FoFs can strengthen their equity capital by lower payouts to owners. As argued before, a more conservative financing policy likely supports job security and may be induced by privileged employee orientation (Hypothesis 3). Also, an FoF owned fully by a charitable foundation, may feel little pressure to pay out a substantial fraction of profits. For anecdotal evidence, the big profitable charity-owned FoFs Bosch, Mahle, and KÃ¶rber pay out about 3, 4, and 10 percent, respectively, of their net income, compared to an average of about 40 percent for the big German corporations listed in the DAX.

As the firms in our sample are composed of corporations and partnerships, it is not possible to measure payouts as in corporations. There is no official payout in partnerships. Therefore, we analyze for firm i in year t

$$\begin{aligned} \text{net payout}_{i,t} &= \text{equity payout}_{i,t} - \text{newly raised equity}_{i,t} \\ &= \text{net income}_{i,t} + \text{equity capital}_{i,t-1} - \text{equity capital}_{i,t}. \end{aligned}$$

The last line follows from the accounting identity

$$\begin{aligned} \text{equity capital}_{i,t-1} &+ \text{net income}_{i,t} \\ &+ \text{newly raised equity}_{i,t} \\ &- \text{equity payout}_{i,t} \\ &= \text{equity capital}_{i,t}. \end{aligned}$$

[5] According to Â§315a (2) of the German Commercial Code listed firms have to publish a consolidated annual statement according to IFRS, beginning in 2005. Non-listed firms can choose to publish a consolidated annual statement according to IFRS or to German accounting rules (Â§315a (3)). Non-consolidated annual statements have to be published according to the German accounting rules.

The decision on the net payout in year t may be driven by the firm's return on equity and the deviation of the leverage from a target-leverage in the previous year. Many firms appear to adjust their financing policy to a long-term target-leverage ratio (Hovakimian (2004)). As the cost of financial distress may increase with leverage in a convex manner, while the tax shield may increase linearly, the payout ratio might react to leverage (= lev) in a non-linear manner. Therefore, we also include the squared leverage in the regression for the payout ratio $\mathrm{PoR}_{i,t}$ (:= net $\mathrm{payout}_{i,t}/\mathrm{equity}_{i,t-1}$). The payout ratio may react differently to positive [$\mathrm{RoE}^{+}_{i,t-1}$] and negative [$\mathrm{RoE}^{-}_{i,t-1}$] return on equity. Therefore, we estimate the sensitivities separately (v_i is the fixed effect for firm i)

$$\mathrm{PoR}_{i,t} = a + b\,\mathrm{RoE}^{+}_{i,t-1} + c\,\mathrm{RoE}^{-}_{i,t-1} + d\,\mathrm{lev}_{i,t-1} + e\,\mathrm{lev}^{2}_{i,t-1} + v_i + \varepsilon_{i,t}. \qquad (1.3)$$

The payout ratio may be influenced in some years by raising substantial new equity capital so that the payout ratio is smaller than −1. In other years, the payout ratio may be higher than 1 because of spin-offs and other divestments. Since these years are exceptional, they are not representative for the normal payout policy. Also, payout ratios tend to be extreme whenever equity is close to 0. Therefore, we exclude payout ratios below −0.9 and above 0.9. Moreover, in some firms equity is sometimes negative. We also exclude these firms.

Table 1.9: Analysis of the Payout Ratio - First Step

PoR_t	$(-0.9; 0.9)$	$(-0.8; 0.8)$	$(-0.5; 0.5)$	$(-0.4; 0.4)$
RoE^{+}_{t-1}	$0.076^{\star\star\star}$	$0.066^{\star\star\star}$	$0.022^{\star}$	$0.022^{\star\star}$
RoE^{-}_{t-1}	0.028	-0.001	-0.033	-0.026
lev_{t-1}	-0.044	-0.091	-0.105	-0.160
lev^2_{t-1}	$-0.337^{\star\star}$	$-0.251^{\star}$	-0.110	-0.032
within R^2	0.0824	0.0683	0.0493	0.0570
# of obs	3399	3376	3247	3186

This table displays the findings for the panel regression of the payout ratio (equation (1.3)). Only firms are included that have positive equity in the whole sample period. Firm fixed effects, year dummies, and regression constants are included, but not shown. Standard errors are adjusted for clustering (firm) effects and heteroscedasticity. $\star$, $\star\star$, $\star\star\star$ indicate statistical significance at the 10%, 5%, and 1% level, resp.

Table 1.10: Analysis of the Payout Ratio - Second Step

Firm fixed effects	$(-0.9; 0.9)$	$(-0.8; 0.8)$	$(-0.5; 0.5)$	$(-0.4; 0.4)$
FoF	$-0.042^{\star\star}$	$-0.033^{\star\star}$	$-0.030^{\star\star\star}$	$-0.024^{\star\star\star}$
IFRS	$-0.087^{\star\star\star}$	$-0.079^{\star\star\star}$	-0.031	-0.020
adj. R^2	0.0447	0.0447	0.0306	0.0196
# of obs	558	556	551	548

This table displays OLS-regressions of firm fixed effects, derived in Table 1.9. FoF and IFRS are dummies which are equal to 1 if a firm is an FoF, resp., if the firm uses IFRS. Only firms are included which do not switch from IFRS to German accounting standards or vice versa in the sample period. Industry dummies and regression constants are included, but not shown. Significance is based on White standard errors correcting for heteroscedasticity. $\star$, $\star\star$, $\star\star\star$ indicate statistical significance at the 10%, 5%, and 1% level, resp.

In the first column of Table 1.9, only payout ratios between -0.9 and 0.9 are included, in the next column only ratios between -0.8 and 0.8, and so forth. The payout ratio increases significantly with a higher positive return on equity (Table 1.9). But there is no significant reaction to a negative return on equity. Firms may stop payouts when they incur losses. Leverage has no significant impact, but squared leverage has a strongly significant negative impact when payout ratios between -0.9 and 0.9 are considered. This suggests that the payout ratio declines in leverage in a concave manner, i.e., the higher the leverage, the stronger is the marginal decline in the payout ratio. Significance is weaker or disappears when payout ratios are restricted to a smaller range.

Next, we OLS-regress the estimated firm fixed effects on the FoF-dummy and the IFRS-dummy (Table 1.10). For all ranges of payout ratios, the FoF-dummy is negative and strongly significant. That indicates that FoFs have lower payout ratios and supports our earlier conclusion that FoFs follow a more conservative financing policy (Hypothesis 3). The interaction term for charity-owned FoFs is always insignificant (not shown). Family foundations apparently do not enjoy higher payout ratios than charity foundations. This is inconsistent with Hypothesis 5.

The payout ratio is negatively affected by IFRS accounting. Hung and Subramanyam (2007) analyze the effects of switching from German accounting rules to IFRS and document that, in many firms, equity capital increases because many assets are valued at market prices under IFRS instead of historical cost. A higher equity lowers the return on equity. This accounting artefact likely explains the negative IFRS effect on the payout ratio.

1.5.4 Financial Performance

Hypothesis 4 claims that the financial performance of FoFs is weaker than that of matching firms due to their stronger employee orientation. As argued before, we consider return on assets (RoA) a better measure of financial performance than return on equity or return on sales because the latter two appear to be biased. Again, we use a two step-procedure. In the first step, we run panel regressions of RoA on operating revenue as a size measure and on operating revenue growth. We use operating revenue growth as a proxy of a firm's aggressiveness in improving its competitiveness. Of course, these growth rates are driven by many factors, including product improvement and innovation by the firm and by its competitors. The median growth rate of operating revenue is insignificantly lower for all FoFs relative to matching firms (not shown). Growth rates are particularly low in FoFs

Table 1.11: RoA-Analysis - First Step

Financial Performance	EBIT/TA		EBITDA/TA
	(1)	(2)	(3)
ln OR	0.051***	0.096	0.049***
$(\ln \text{OR})^2$	-	−0.001	-
$\ln(\text{OR}_t/\text{OR}_{t-1})$	0.079***	0.079***	0.077***
lev	0.150**	0.148**	0.135**
lev^2	−0.247***	−0.244***	−0.230***
within R^2	0.1733	0.1735	0.1695
# of obs	5464	5464	5335

This table shows the findings of a panel regression estimating return on assets $\text{RoA}_{i,t} = a + b \ln \text{OR}_{i,t} + c\ \text{growth}_{i,t} + d\ \text{lev}_{i,t} + e\ \text{lev}_{i,t}^2 + v_i + \varepsilon_{i,t}$. Growth is $\ln(\text{OR}_t/\text{OR}_{t-1})$. v_i is the fixed effect for firm i. In the last column, EBIT/TA is replaced by EBITDA/TA. Year dummies and a constant are included in the regression, but not shown. Standard errors are adjusted for clustering (firm) effects and heteroscedasticity. $\star$, $\star\star$, $\star\star\star$ indicate statistical significance at the 10%, 5%, and 1% level, resp.

where the foundation has the majority of votes, the majority of equity claims, or full liability. This is weak evidence that FoFs are less aggressive.

We also use leverage and leverage squared as regressors. The effect of a low leverage might be a generous spending policy as stated by the free cash flow argument (see Jensen (1986), Core et al. (2005) for agency problems related to excess endowments). Hence, an increase of a low leverage might constrain generous spending and thereby increase RoA. The effect of a high leverage might be a shortage of funds available for investments leading to underinvestment (Myers (1977)). An increase of a high leverage might reinforce this shortage and thereby lower RoA.

Table 1.12: RoA-Analysis - Second Step

Firm fixed effects	(1)	(2)	(3)	(4)	(5)	(6)	(7)
FoF	−0.040***	−0.023**	−0.021*	−0.021**	−0.076***	−0.049***	−0.016
char × FoF	0.016	-	-	-	-	-	-
full liab × FoF	-	-	-	-	-	-	−0.075***
codetermination	-	−0.104***	−0.105***	−0.106***	−0.105***	−0.106***	−0.107***
FoF × codetermination	-	−0.003	−0.005	-	-	-	-
Listed Res	-	-	−0.030*	−0.041**	-	-	-
FoF × Listed Res	-	-	0.096**	0.082*	-	-	-
FoF × PPM	-	-	-	0.002*	-	0.003***	0.002**
(1 - FoF) × PPM	-	-	-	0.005***	-	0.004**	0.004***
FoF × age	-	-	-	-	-	0.002*	-
FoF × age^2	-	-	-	-	-	−0.00002**	-
FoF × vote share	-	-	-	-	0.294***	-	-
FoF × $(\text{vote share})^2$	-	-	-	-	−0.244***	-	
σ(RoA)	0.990***	0.876***	0.871***	0.788***	0.875***	0.802***	0.782***
IFRS	−0.124***	−0.094***	−0.090***	−0.082***	−0.091***	−0.087***	−0.085***
adj R^2	0.2861	0.4040	0.4044	0.3738	0.4064	0.3750	0.3777
# of obs	773	789	789	714	789	697	714

This table shows the findings of OLS-regressions of firm fixed effects v_i, estimated in the first regression of Table 1.11. FoF is a dummy which is 1 for an FoF and 0 otherwise. "char × FoF", "unlim liab × FoF" are interaction variables multiplying the FoF-dummy with a dummy which is 1 if the foundation is charitable or has unlimited liability, respectively; otherwise they are 0. "Codetermination" is a dummy which is 1 for a corporation with a supervisory board in which at least 1/3 of the seats are assigned to employee representatives. "FoF × codetermination" is an interaction variable multiplying the FoF-dummy with the codetermination-dummy. "Listed Res" is the residual from a linear regression of the listing dummy on the IFRS-dummy. The listing dummy is 1 for a firm listed at a stock exchange, 0 otherwise. "FoF × Listed res" is an interaction variable multiplying the FoF-dummy with the listed residual. "FoF × PPM" and "(1 - FoF) × PPM" are interaction variables multiplying a dummy with the ratio "Personnel expense/material expense". "FoF × age" is an interaction variable multiplying the FoF-dummy with the age of an FoF. Age is measured by the time between the setup as an FoF and 2013. "FoF × vote share" is the vote share of the FoF multiplied by the FoF-dummy. σ(RoA) is the standard deviation of the RoA-time series of a firm. IFRS is a dummy which is 1 if the firm uses IFRS, 0 otherwise. Only firms are included which do not switch from IFRS to German accounting standards or vice versa in the sample period. Industry dummies and regression constants are included, but not shown. Significance is based on White standard errors correcting for heteroscedasticity. ⋆, ⋆⋆, ⋆⋆⋆ indicate statistical significance at the 10%, 5%, and 1% level, resp.

RoA increases with ln OR (Table 1.11) as expected. The positive coefficient in the panel regression does not necessarily indicate economies of scale effects. As FoFs likely have a broader portfolio of products and services than matching firms, a positive size effect would be consistent with both, economies of scale and scope effects. Splitting FoFs and matching firms into quartiles of operating revenue shows quite different pictures. The median RoA of FoFs is lowest (highest) in the lowest (highest) OR-quartile, but this is reversed for the matching firms. This suggests more effective governance in larger FoFs and/or economies of scale for FoFs, but diseconomies of scale for matching firms. The relation between RoA and ln OR might be inversely u-shaped. This is not supported by regression (2).

The positive effect of operating revenue growth is strongly significant as expected. The leverage effect is inversely u-shaped and strongly significant. That supports the free cash flow argument for low levels of leverage and the underinvestment argument for high levels of leverage. The inverse u-shape attains it peak at a leverage of 0.26 while most firms operate at a leverage above 0.5. Hence, they operate on the declining part of the curve.

In the second step, we OLS-regress the firm fixed effects, estimated in the first regression of Table 1.11, on different FoF-characteristics. All regressions in Table 1.12, except for the last one, show a significantly negative coefficient of the FoF-dummy. In support of Hypothesis 4, RoAs are significantly smaller in FoFs than in matching firms. In the first regression, the interaction term for charity-owned FoFs is insignificant so that RoA does not depend on ownership of a charitable or a family foundation.

We always include as a regressor the standard deviation of the firm's RoA, σ(RoA), derived from the time series of the firm's RoA. The median σ(RoA) is lower for FoFs (3.7 percent) than for matching firms (4.8 percent), the difference is strongly significant[6]. The regression coefficient is always positive and strongly significant. Hence, firms with higher risk tend to earn higher returns. We also include the IFRS-dummy because accounting rules may have an effect on RoA. As argued before, under IFRS various assets are valued at market instead of historical cost. That raises total assets and lowers RoA. This is strongly confirmed in all regressions.

In the next regressions in Table 1.12, we include a codetermination dummy. van Essen et al. (2013) find that labor institutions matter for blockholder effectiveness in European countries. According to German law, in a corporation 1/3 resp. 1/2 of the seats in the supervisory board are assigned to employee representatives if the number of employees exceeds 500 resp. 2000. In both cases, the codetermination dummy of a firm is 1. The impact of the codetermination dummy is strongly negative and strongly significant. The interaction term "FoF-dummy × codetermination dummy" is insignificant. That indicates that codetermination lowers RoA, this effect is about the same for FoFs and matching firms. The findings are similar if we restrict the codetermination dummy to corporations with more than 2000 employees.

In the third regression, we analyze listing effects. Each listed firm has to use IFRS. Therefore, the IFRS-dummy and the listing-dummy (= 1 for a listed firm) are strongly correlated. To avoid multicollinearity, we first linearly regress the listing dummy on the IFRS-dummy and use the regression residual "Listed res" in Table 1.12. Surprisingly, "Listed res" has a weakly significant, negative impact on RoA. Apparently, capital market control does not appear to improve RoA. Our finding is consistent with Bezemer et al. (2015) who find that Dutch firms which reinforce their shareholder value orientation end up with lower financial performance. But the interaction term "FoF-dummy × Listed res" has a significantly positive impact on RoA. To derive the net effect of listing for FoFs, we add the regression coefficients of "Listed Res" and of the interaction term, $-0.030 + 0.096 = 0.066$. This term is positive, but insignificant. Hence, it appears that listing has a significantly negative effect on the RoA of matching firms, but an insignificantly positive effect on the RoA of FoFs. Thomsen and Hansmann (2013) also find that listing improves the financial performance of Danish FoFs.

[6] It is well known that larger firms tend to have lower risk due to more diversification of their activities. But a linear regression of the standard deviations of return on assets shows that the larger size of FoFs can only explain a small part of the negative difference in standard deviations between FoFs and matching firms. Thus, FoFs appear to play a safer game.

These listing effects are also supported by regression (4) in which we include labor intensity measured by PPM (personnel expense over material expense). Its regression coefficient is about twice as high for matching firms than for FoFs and strongly significant. This indicates that matching firms could benefit by less labor intensity. Possibly, they outsource too much. The listing effects disappear, however, when we match firms according to industry, size, and, in addition, to age (not shown). Age is the time span from the incorporation of the firm until 2013.

In regression (5), we drop the listing and the PPM variables and include, through interaction terms, the voting share of the foundation and its square. The vote-effect is inversely u-shaped and clearly significant. This is in line with some studies of corporate governance which suggest that a stronger owner improves financial performance by reducing agency problems, but a very strong owner lowers it because she may extract private benefits from the firm (McConnell and Servaes (1990), Himmelberg et al. (1999)). But the empirical evidence on the relation between ownership structure and financial performance is controversial (see the excellent overview in Demsetz and Villalonga (2001)). When the vote share of the foundation is replaced by its equity share, then, this share has no significant effect (not shown). This does not come as a surprise because the equity share should not matter for corporate governance.

Apart from the FoF's voting share, blockholders might affect financial performance (see van Essen et al. (2013)). To check for that in FoFs, we define the free float as the percentage of voting rights neither held by the foundation nor by blockholders. A blockholder has at least 5 percent of the voting rights. We find that in 3/4 of the FoFs there is no free float. Thus, most FoFs are closely held firms. It turns out that neither free float nor the number of blockholders affects RoA (not shown).

In regression (6) we check for effects of age, measured by the number of years since the firm's incorporation until 2013. The median age is 54 years for FoFs and 30 years for matching firms. This difference might indicate a survivorship bias. To check for that bias, we include age in the RoA-regression. As vote share and age of FoFs are strongly correlated, we drop the vote share. We do not find significant age effects for matching firms (not shown). When we distinguish matching firms with an age above and below 30 years, we do not find evidence for generational effects. Alternatively, we measure the age of an FoF by the number of years since its setup as an FoF until 2013. When age is included as a linear or loglinear regressor, it has no impact on the RoA of FoFs. When we include age as a quadratic function, we find a significant inverse u-shaped age effect (regression (6)). The findings for FoFs are the same if age is measured by the FoFs' incorporation age. Thus, there is some weak evidence that old FoFs earn a lower RoA.

There might be an aging effect of single FoFs over the sample period from 2003 to 2012. To check for that, we rerun the first regression in Table 1.11 including, besides of year dummies, the interaction terms "year dummy × FoF-dummy". Their coefficients are insignificant (not shown). Hence, we do not observe aging effects. FoFs likely have rather stable policies. They may inherit these policies from the days before the foundation setup[7].

In the last regression in Table 1.12, we check the performance of FoFs with unlimited liability of the foundation. The interaction dummy "full liability dummy × FoF-dummy" has a significantly negative impact on RoA. It suggests, in contrast to the descriptive statistics in Table 1.3, that full liability FoFs earn lower RoAs. This may partly explain why these FoFs exist. Full liability is more dangerous if RoA is lower, motivating natural persons as partners to escape full liability. As the FoF-dummy turns insignificant, a substantial part of the RoA-gap appears to be driven by FoFs with fully liable foundations. But if we match firms with respect to industry, size, *and* age, then full liability shows no RoA-effects.

Finally, FoFs might have fared better in the recent financial crisis than matching firms. van Essen et al. (2015b) find that family controlled firms are less likely to downsize their workforce or cut wages in the crisis. As the German government heavily subsidized firms to maintain their work force in the crisis, downsizing and wage cuts are not visible in Germany. Analyzing firm fixed effects shows that the RoA-gap between FoFs and matching firms also exists in the crisis years 2008-2010 (not shown).

Our findings on RoA are not inconsistent with those of Herrmann and Franke (2002)

[7] This is also consistent with Franks et al. (2012) who find that family control persists in countries with inactive markets for corporate control. Germany might belong to these countries.

and those of Thomsen (1996), Thomsen and Rose (2004), and Thomsen and Hansmann (2013) for Denmark. They do not find lower RoAs for FoFs. Most of these papers compare FoFs with listed firms, while we compare them with mostly family/closely held firms.

1.5.5 Risk-Adjusted Financial Performance

Comparing RoAs is adequate if all firms are equally risky. But the standard deviation of RoA is mostly smaller for FoFs than for matching firms. Therefore, we also derive for each firm a Sharpe ratio SR := average (RoA − 12 months money market rate)/σ(RoA). Its median is 1.06 for FoFs and 1.09 for matching firms; the difference is small and insignificant. In the OLS-regression

$$\begin{aligned} \text{SR} = a \quad &+ \quad b \ln \text{average (OR)} + c \text{ FoF-dummy} \\ &+ \quad d \text{ IFRS-dummy} + \text{industry dummies} + \text{noise}, \end{aligned}$$

all coefficients are insignificant. Also, when we check for subsets of FoFs and codetermination effects, we do not find significant coefficients. Hence, there is no visible difference in risk-adjusted financial performance of FoFs and matching firms, measured by the Sharpe ratio.

1.6 Robustness Checks

We do many robustness checks some of which we report in the following.

(1) Under IFRS and German accounting principles firms can manage their earnings through various channels. The most important is arguably depreciation and amortization. Therefore, we repeat the analysis of financial performance by replacing RoA = EBIT/TA by EBITDA/TA. EBITDA equals EBIT plus depreciation including amortization. The firm fixed effects are derived from the last regression in Table 1.11. For these firm fixed effects, we run the same regressions as in Table 1.12. As the analysis yields similar results, we do not report them.

(2) The RoA-findings might be different for small and for large FoFs. Therefore, we repeat the analysis for different size quartiles of FoFs. The results change little. FoFs always have a slightly lower RoA relative to matching firms.

(3) The panel regressions for RoA assume that the sensitivities are the same for FoFs and matching firms. This assumption is dangerous because the previous findings indicate that the production policy of FoFs differs from that of matching firms. Therefore, we also include interaction terms for FoFs in the first step. Their coefficients are insignificant.

(4) Possibly, more risky firms pay out less to stabilize solvency. Therefore, we include the standard deviation of RoA in the OLS-regressions of firm fixed effects in Table 1.10. Its coefficient is positive and weakly significant only if the payout ratio is restricted to the range $(-0.9;\ 0.9)$. This suggests that a firm's risk has a very small impact on its payout policy.

(5) Somewhat tricky is the estimation of the Cobb-Douglas function. In Table 1.4, we report the results for a log-linear Cobb-Douglas function. We also run a panel regression for a quadratic function (translog production function) in personnel and material expense with separate slopes for matching firms and FoFs. We estimate four linear terms, four quadratic terms, and two cross-terms. The coefficients of three linear terms are insignificant; all the other coefficients are significant with varying sign (not shown). That makes it hard to interpret these coefficients. It indicates that the findings for the log-linear Cobb-Douglas function in Table 1.4 need to be interpreted with caution.

(6) We also check whether the number of matching firms has a strong impact on our findings. The results are quite similar if we move from 5 to 4 or 3 matching firms, but the findings change more if we move to 2 or 1 matching firm(s). This is to be expected because with one matching firm the specifics of this firm matter a lot (even though size can be matched more precisely).

(7) We also rerun our analysis using a different matching procedure. Within the same industry we match an FoF with other firms by size and by age using nearest neighbor matching (Abadie et al. (2004)). The results (not shown) are quite similar to those obtained before. But all listing effects and the full liability effect on RoA are now insignificant.

Table 1.13: Logistic Regression

FoF	Coefficients	
ln OR	-	0.186***
ln OR-growth	−1.754	−1.890
PPM	0.063***	0.071***
Leverage	−1.563***	−1.737***
RoA	−3.508**	−3.577**
σ(RoA)	−7.836**	−6.389**
HL p-value	0.578	0.864
# of obs	774	774
# of groups	10	10

This table shows the results of a logistic regression to find out which variables predict whether a firm is an FoF. For each time-dependent variable we take the average of its observations within the sampling period as a regressor. OR-growth is (OR_t/OR_{t-1}). PPM is "Personnel expense/material expense". RoA is return on assets. σ(RoA) is the standard deviation of the firm's return on assets within the sampling period. Industry dummies are included, but not shown. Significance is based on White standard errors correcting for heteroscedasticity. The Hosmer-Lemeshow (HL) p-value indicates the goodness of fit of the logistic regression. If it is less than 10 percent, the model should be rejected as insignificant. $\star$, $\star\star$, $\star\star\star$ indicate statistical significance at the 10%, 5%, and 1% level, resp.

(8) Finally, we run a logistic regression to find out strong predictors for a firm to be an FoF. The results are shown in Table 1.13. An important predictor is the size measure "Operating revenue". In the first regression size is omitted, in the second it has a strongly significant positive coefficient. The Hosmer-Lemeshow p-value which measures the goodness of fit of the model, strongly increases from about 58 percent to about 86 percent. Hence, a higher operating revenue raises the likelihood of a firm to be an FoF. The other predictors are the same in both regressions. Annual growth of operating revenue tends to be smaller in FoFs, but is insignificant. Strongly significant are "Personnel expense/material expense" (PPM) and leverage. As expected, FoFs are more labor-intensive and less leveraged. Also, a lower average return on assets and a lower standard deviation of this return raise the likelihood of a firm to be an FoF. The Hosmer-Lemeshow p-value of 86 percent indicates a very good fit of the model. This suggests that omitted variables are not a major problem in our analysis.

1.7 Conclusion

This paper analyzes the policy and financial performance of German foundation owned firms (FoFs), a very unusual class of firms. In these firms the role of natural persons as residual claimants is weakened or eliminated giving room to agency problems due to separation of ownership and control. An analysis of these firms allows us to derive important insights into agency and corporate governance problems. Entrepreneurs usually set up a foundation together with an FoF to assure the long run existence of the firm. Typically, these firms originate from family/closely held firms.

In FoFs in which natural persons have a weak position as residual claimants, employees might strengthen their influence to earn rents in the form of higher wages, more jobs, and more job security. Higher wages might endanger competitiveness and long-term viability of the FoF. Our findings suggest that employees and board members do not receive higher income. But FoFs appear to be more labor-intensive, they substitute labor for material, but not for capital. This may be explained by a long-term privileged employee orientation combined with more investments induced by lower payouts to owners. The hiring and firing policy of FoFs is hardly different from that of matching firms. Thus, some aspects of the employment policy of FoFs provide some support for agency theory, others do not.

The financing policy of FoFs is more conservative. This stabilizes FoFs financially and, perhaps, also employment, it also protects creditors. Stabilization is also supported by lower risk taking of FoFs. Their return on assets tends to be smaller as well. However, a Sharpe ratio which is a measure of risk-adjusted financial performance, is about the same for FoFs and matching firms.

Return on assets is about the same in FoFs with ownership of charitable versus family foundations. But it tends to be lower when the family foundation was set up to eliminate unlimited liability of natural persons being partners. Listing at a stock exchange has a very weak positive impact on the RoA of FoFs, but a negative impact on matching firms. Capital market control may partly substitute for weak residual claimants in FoFs. But these listing effects disappear when the matching of firms is also based on firms' age.

Our findings do not support the simplistic agency theory based view that in competitive markets only firms with strong residual claimants survive in the long run. Corporate governance of FoFs appears to be long-term oriented. This is presumably supported by the charter and the regulation of the foundation, by long-term orientation of employees, and, perhaps, a corporate culture preserving the spirit of the founder.

This contrast between simplistic agency theory and observed corporate governance outlines an important agenda for future research. Absence or weakness of residual claimants and privileged employee orientation of FoFs apparently do not impair their risk-adjusted financial performance. This surprising finding suggests mechanisms of corporate governance which effectively constrain dangers of privileged employee orientation and, thus, substitute for strong residual claimants. Which mechanisms are responsible for this result and how do they interact? More detailed studies of these mechanisms are required to understand which sets and interactions of mechanisms induce corporate policies satisfying the needs of different stakeholder groups and assuring long-term viability of firms. A comparison with FoFs in Denmark and the analysis of corporate governance mechanisms in other countries, in which the role of residual claimants varies substantially, should help to answer these questions.

Appendix 1.A Analysis of Elasticities

Assume that the firm produces various services and products such that the operating revenue is given by ln OR = α ln PE + β ln ME + γ ln DE + δ ln OE with $\alpha+\beta+\gamma+\delta = 1$. The firm maximizes κ OR + $(1-\kappa)$ PE, s.t. the budget constraint PE + ME + DE + OE = TC. The FOCs are (λ is the Lagrange-multiplier of the budget constraint)

$$\begin{aligned} \mathrm{PE}^{\star}: \quad & \kappa\,\alpha\,\mathrm{OR/PE} + (1-\kappa) && = \lambda \quad \text{and} \\ \mathrm{ME}^{\star}: \quad & \kappa\,\beta\,\mathrm{OR/ME} && = \lambda. \end{aligned}$$

The FOCs for DE and OE are the same as that for ME except for replacing β by the corresponding elasticities and replacing OR/ME by OR/DE resp. OR/OE. Solving the FOCs for the elasticities and adding the equations yields (because $\alpha+\beta+\gamma+\delta = 1$) $\kappa + (1-\kappa)$ PE/OR = λ TC/OR. Replacing λ from this equation in the FOCs yields the rewritten FOCs

$$\begin{aligned} \mathrm{PE}^{\star}: \quad & \mathrm{PE/TC} = \alpha + (1-\alpha)\,\mathrm{B} && =: \alpha(\kappa) \\ \mathrm{ME}^{\star}: \quad & \mathrm{ME/TC} = \beta\,(1-\mathrm{B}) && =: \beta(\kappa) \end{aligned}$$

with $\mathrm{B} := (1-\kappa)\ (\mathrm{PE/OR})\ [\kappa + (1-\kappa)\ \mathrm{PE/OR}]^{-1}$ so that $0 < \mathrm{B} < 1$.

Now, consider a move from stakeholder to employee orientation, modeled by an increase in $(1-\kappa)$. Then, the optimal personnel expense increases, while the optimal operating revenue declines. Hence, B increases. The optimal share PE/TC and the elasticity of operating revenue with respect to personnel expense, $\alpha(\kappa)$, increase, while the other cost shares and their corresponding elasticities go down. This motivates Hypothesis 2.

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Chapter 2

Foundation Owned Firms - A Detailed Decomposition of Differences in Return Distributions

2.1 Introduction

In Germany, Denmark, and Sweden big firms like Aldi, Bosch, Carlsberg, IKEA, and ThyssenKrupp are important players. They have in common that they are owned by a foundation. Foundations are legal entities without owners. They act and operate in line with the charter set up by the founder. For example, profit payments of foundation owned firms (FoFs) to the owner foundation have to be spent for purposes defined in the charter. The beneficiaries of charitable foundations are charitable projects and programs, those of family foundations are members of the founder's family. Hence, in contrast to other profit-oriented firms, there are fewer or no natural persons being residual claimants in FoFs. Traditional agency theory suggests that strong corporate governance of residual claimants is required for a firm to be viable in the long run; natural persons as owners with a strong profit motive are likely to push the management for high profits. If they are absent, other stakeholders might exploit the firm for their own benefits which could weaken financial performance and endanger the existence of the firm in the long run. Interestingly, many examples and several studies of FoFs show that they are clearly viable.

This study investigates how FoFs and firms that are not owned by a foundation (Nons) differ in terms of their financial performance, measured by returns on assets. We use accounting information of German firms to decompose the return distributions for 109 FoFs and about 11000 Nons. For a meaningful analysis, Nons are selected such that their firm policies are similar to those of FoFs; in our case, we remove firms having at least one firm policy variable being smaller than the FoFs' minimum or larger than the FoFs' maximum for that variable. In addition, we account for industry fixed effects in most of our models. Using the method of Rothe (2015), we isolate the impact of relevant firm policies on the difference in returns. In contrast to established decomposition methods by Blinder (1973) and Oaxaca (1973)[1], the method allows for analyzing return differences at different quantiles and not only at the mean and is robust with respect to nonlinear data generating processes and hence able to capture more observable heterogeneity than a simple linear mean model. In contrast to quantile regression methods or sequential decompositions, the effects of the analyzed variables add up to the overall return difference of FoFs and Nons when using the Rothe (2015) method. In

[1]The decomposition of Blinder (1973) and Oaxaca (1973) is a special case of the method of Rothe (2015), see Section 2.2.

addition, we address the problem of a potential simultaneity bias that is adherent when using accounting data. We give a detailed discussion on how parameter estimates in a linear framework can be misleading if contemporaneous accounting information is used for estimation. Our identification approach exploits persistence of firm variables to obtain the actual determinants of return differences or at least absolutely lower bounds depending on the type of variable considered and degree of persistence over time. In addition to prior studies such as Draheim and Franke (2015), the paper contains a fully conditional analysis that considers all potential firm policy variables that affect returns simultaneously which goes beyond simple component-wise group comparisons.

Comparing the mean and quantiles of returns, we find pronounced return differences for the mean and high quantiles, where the returns of FoFs are significantly lower. A substantial proportion of the observed return differences at several quantiles can be attributed to differences in firm policies. We find that (1) lower risk in FoFs, as measured by the standard deviation of return on assets, increases FoF underperformance at high quantiles, but offsets it at low quantiles, (2) a lower leverage of FoFs offsets FoF underperformance at low quantiles and the median, (3) higher labor intensity in FoFs offsets FoF underperformance at low quantiles, (4) the larger size of FoFs increases FoF underperformance for the mean and all quantiles, (5) lower operating revenue growth rates of FoFs increase FoF underperformance at high quantiles, and (6) residual differences beyond firm policies tend to be insignificant.

Reasons for differences in firm policies and financial performance of FoFs and Nons are manifold. One important driver may be the profit motive that appears to be weaker in FoFs due to the lack of natural persons as residual claimants. In addition, most foundation charters support a stable development of the foundation's wealth and long-term orientation in FoFs. Therefore, managers may be less incentivized to generate profits by taking higher risks, but to pursue stable firm policies. This might explain lower returns of FoFs at a lower return volatility. In particular, this seems to hold for high quantiles of return on assets, see (1). A high equity buffer might serve as protection against economic downturns; FoFs tend to have a lower leverage. Apparently, a lower leverage in FoFs might translate into more freedom of action with respect to investments, in contrast to a potential shortage of funds in Nons due to high leverage (Myers (1977)). In line with that, we find that a lower leverage is beneficial for FoFs, in particular at lower return quantiles, see (2). Labor intensity appears to be higher in FoFs. We find pronounced substitution of raw material by labor in FoFs. Surprisingly, this seems to be beneficial for FoFs at low return quantiles, see (3). Only successful entrepreneurs usually transform their firms into an FoF. Thus, FoFs tend to be large, already when they are set up. We find that they are much larger than Nons. Small firms are usually more dynamic and react faster to changes in the market environment. Consistently, we find that the bigger size of FoFs contributes to underperformance over the whole return distribution, see (4). Possibly due to more long-term orientation that favors more conservative strategies, operating revenue growth rates in FoFs tend to be lower. This seems to explain underperformance of FoFs, in particular at high quantiles, see (5). We find that differences in these policies can explain a substantial proportion of return differences over the whole distribution, see (6).

Several studies compare the financial performance of Danish FoFs to different control samples. Thomsen (1996) uses the largest 150 Danish Nons, Thomsen (1999) uses Nons listed at the Copenhagen Stock Exchange, and Thomsen and Rose (2004) use Danish Nons with dispersed ownership or family control as benchmarks. All studies find that the financial performance of Danish FoFs is not inferior. Hansmann and Thomsen (2013) find that financial performance of FoFs improves if there is less personal overlap between the boards of the foundations and those of the corresponding FoFs, more outside ownership, and more administrative independence of foundations and FoFs. For Germany, Herrmann and Franke (2002) compare FoFs to German firms being listed at a stock exchange. They find that FoFs perform even slightly better. In addition, labor intensity is higher in FoFs. Draheim and Franke (2015) analyze a larger sample of German FoFs. Additionally, they control for different institutional setups of FoFs. They find that, relative to control firms, FoFs are more conservative in terms of financing policy, they are more labor-intensive, their financial performance, measured by return on assets, is lower; their risk, measured by the standard deviation of returns on assets, is also lower. As a consequence, risk-adjusted financial performance of FoFs is not significantly different from Nons. We add to the literature by decomposing the return differences of FoFs and Nons at several quantiles. We attribute a substantial proportion of these differences to differences in firm policies that Draheim and Franke (2015) identify. It turns out that the impact of these policies varies when comparing top-, average- and low-performers.

The paper is structured as follows. In the next section, there is an overview over the relevant decomposition methods. Then, we discuss identification and simultaneity issues. Estimation and inference are addressed in the subsequent section. Then, the following section describes the data. Observational findings are shown in the subsequent section. After reporting and discussing decomposition results, the paper concludes.

2.2 Decomposition Methods

Since the seminal work of Blinder (1973) and Oaxaca (1973) decomposition methods of distributional features from non-overlapping groups have been heavily used in economics. The literature on labor market or education outcomes decomposes differences in wages or test scores between two groups such as genders, time periods, or migrants and natives. It is the objective to investigate whether differences of an outcome variable are due to differences of explanatory variables, such as the level of education in the context of wage analyses, and the magnitude of these variables. Here, we are particularly interested in differences in the financial performance measured by the return on assets between FoFs and Nons.

For two groups $g = 0, 1$, a simple linear mean model for the return on assets, denoted by Y_i^g, within groups is given by

$$Y_i^g = X_i^{g\prime}\beta^g + \varepsilon_i^g \tag{2.1}$$

assuming an error orthogonal to the regressors, Y_i^g being the return of firm i belonging to group g and X_i^g being a vector of firm-specific covariates such as financing policies or size measures. Using this model, one can decompose the difference in the mean outcomes between group 0 and 1 as follows

$$\begin{aligned} E[Y_i^1] - E[Y_i^0] &= E[X_i^1]\beta^1 - E[X_i^0]\beta^0 \\ &= \underbrace{E[X_i^1](\beta^1 - \beta^0)}_{\Delta_S^\mu \text{"Structure effect"}} + \underbrace{(E[X_i^1] - E[X_i^0])\beta^0}_{\Delta_X^\mu \text{"Composition effect"}}. \end{aligned}$$

The two components of the decomposition are also referred to as price or discrimination and endowment effect, respectively. This aggregate decomposition can yield insights into the overall contribution of differences in firm policies to differences in financial performance. To get the separate effect of each policy variable, the composition effect can be decomposed as follows

$$\Delta_X^{\mu} = \sum_{k=1}^{K} (E[X_{ik}^1] - E[X_{ik}^0])\beta_k^0 \tag{2.2}$$

with each element within the summation representing the marginal impact of the k-th covariate on the aggregate composition effect. Computing a detailed decomposition at the mean is labeled a solved problem in the literature (Fortin et al. (2011)). Its solution does not depend on the ordering of the covariates and adds up to the total effect.

For quantiles and distributional features other than the mean, the analysis is inherently difficult since they are no longer additive separable functions in the population defining parameters, in contrast to the mean function. Consequently, sequential detailed decompositions are widely used (DiNardo et al. (1995), Machado and Mata (2005), Altonji et al. (2012), Chernozhukov et al. (2013)). Their general idea is to first get an estimate for the contribution of a single variable to the aggregate decomposition and then conditional on the first variable for a subsequent one and so forth leading to an overall *path dependent* decomposition. This is an unattractive feature and in many examples these path-wise decompositions are strongly varying across different orderings. Another approach is based on local approximations of the differences via recentered influence function regressions (Firpo et al. (2009), Firpo et al. (2013)). They tend to be inaccurate if the compared distributions are not close to location shifted versions of each other or if their differences are generally large.

Rothe (2015) proposes a more general decomposition for one-dimensional distributional features such as quantiles or standard deviations. He relies on a copula approach to rewrite the joint distribution function of the explanatory variables as a continuous function of marginal distributions only which eases the construction of counterfactual distributions. His approach gives a *path independent* detailed decomposition of the composition effect into three different components: changes in marginal distributions, interactions, and a difference in the dependence structure of the explanatory variables across groups.

Formally, for two groups $g = 0, 1$, let F_Y^g and F_X^g be the distribution functions for outcome Y and covariates X with support $\mathcal{Y}^g$ and $\mathcal{X}^g$ and the conditional cumulative distribution function be $F_{Y|X}^g$. A distributional feature of interest $v(F)$ is a functional such that $v : \mathcal{F} \to \mathbb{R}$ maps from all one-dimensional distribution functions to the real numbers such as the mean or a quantile. The overall difference for a functional v between two group outcomes Δ_O^v is then given by

$$\begin{aligned}\Delta_O^v &= v(F_Y^1) - v(F_Y^0) \\ &= \underbrace{(v(F_Y^1) - v(F_Y^{0|1}))}_{\Delta_S^v\text{"Structure Effect"}} + \underbrace{(v(F_Y^{0|1}) - v(F_Y^0))}_{\Delta_X^v\text{"Composition Effect"}}\end{aligned}$$

with

$$F_Y^{0|1}(y) = \int F_{Y|X}^0(y, x) dF_X^1(x) \tag{2.3}$$

being a *counterfactual* distribution that uses the conditional distribution of the outcome given observables as in group zero but the joint distribution of the explanatory variables as in group one. This corresponds to a hypothetical distribution that could be observed for group one if the observations became part of the zero group. We impose $\mathcal{X}^1 \subset \mathcal{X}^0$ to assure that the integral in (2.3) is well-defined or put differently that the range of firm policy variables are overlapping and hence comparable across groups. For further related identification assumptions see the subsequent section.

To get a detailed decomposition Rothe proposes to rewrite (2.3) in terms of the single marginal distributions. By Sklar's Theorem (Sklar (1959)) for continuously distributed variables there exists a unique function $C_g(\cdot)$ called coupla such that

$$F_X^g(x) = C^g(F_{X_1}^g(x_1), \ldots, F_{X_d}^g(x_d)) \text{ for } g \in \{0, 1\}.$$

The copula is effectively a multivariate cumulative distribution function with standard uniformly distributed marginals. For a short example on why the copula can be helpful for a general decomposition, consider the case of two covariates, i.e., $K = 2$.

By adding and subtracting, one can rewrite the composition effect as follows

$$\begin{aligned}\Delta_X^v =& v\left(\int F^0_{Y|X}(y,x)dC^1(F^1_{X_1}(x_1),F^1_{X_2}(x_2))\right) \quad + v\left(\int F^0_{Y|X}(y,x)dC^0(F^1_{X_1}(x_1),F^1_{X_2}(x_2))\right)\\ &\underbrace{- v\left(\int F^0_{Y|X}(y,x)dC^0(F^1_{X_1}(x_1),F^1_{X_2}(x_2))\right)}_{\Delta_D^v\text{"Dependence Effect"}} \underbrace{- v\left(\int F^0_{Y|X}(y,x)dC^0(F^0_{X_1}(x_1),F^0_{X_2}(x_2))\right)}_{\beta^v(1,1)}.\end{aligned}$$

Note that the dependence effect uses the same marginal and conditional distributions and hence is only affected by differences between the copula functions of the two groups which can be interpreted as a difference in the dependence structure of the covariates across the two groups. By adding and subtracting, the second component on the right hand side can further be rewritten as

$$\begin{aligned}\beta^v(1,1) =& v\left(\int F^0_{Y|X}(y,x)dC^0(F^1_{X_1}(x_1),F^0_{X_2}(x_2))\right) - v(F^0_Y) && \Rightarrow \Delta^v_M(1,0)\\ &+ v\left(\int F^0_{Y|X}(y,x)dC^0(F^0_{X_1}(x_1),F^1_{X_2}(x_2))\right) - v(F^0_Y) && \Rightarrow \Delta^v_M(0,1)\\ &+ \left.\begin{bmatrix} v\left(\int F^0_{Y|X}(y,x)dC^0(F^1_{X_1}(x_1),F^1_{X_2}(x_2))\right) - v(F^0_Y)\\ -v\left(\int F^0_{Y|X}(y,x)dC^0(F^1_{X_1}(x_1),F^0_{X_2}(x_2))\right) - v(F^0_Y)\\ -v\left(\int F^0_{Y|X}(y,x)dC^0(F^0_{X_1}(x_1),F^1_{X_2}(x_2))\right) - v(F^0_Y)\end{bmatrix}\right\} && \Rightarrow \Delta^v_M(1,1)\end{aligned}$$

with $\Delta^v_M(\mathbf{k})$ reflecting the direct contribution of a possibly simultaneous change of the covariates defined by $\mathbf{k} \in \{0,1\}^K$. For the first component $\Delta^v_M(1,0)$ note that it can only be driven by a change of the marginal distribution of the first covariate X_1 of group zero to $F^1_X(x_1)$ while conditional distribution, copula, and remaining marginal distributions are being held fixed. This corresponds to a fixed partial distributional policy effect Rothe (2012). $\Delta^v_M(0,1)$ can be interpreted similarly while $\Delta^v_M(1,1)$ is the difference due to a joint change in the marginal of both covariates minus the individual marginal contributions $\Delta^v_M(1,0)$ and $\Delta^v_M(0,1)$ which can be interpreted as a pure interaction effect.

For the general case, one can rewrite the composition effect in a similar fashion as

$$\Delta^v_X = \sum_{i\le|\mathbf{k}|\le K} \Delta^v_M(\mathbf{k}) + \Delta^v_D$$

with $|\mathbf{k}| = \sum_{i=1}^{K} \mathbf{k}_i$. The components $\Delta_M^v(\mathbf{k})$ can capture either direct contribution of a change in the marginal distribution of a variable to the overall difference, i.e., $\mathbf{k}$ being the corresponding unit vector or contributions of interaction terms.

The difference in the copulas or the dependence structure Δ_D^v is a new component that is not addressed by prior decomposition methods. In the context of firm accounting data we would expect this effect to be close to zero since the stochastic relation of fundamental firm data taken from balance sheet information is unlikely to differ based on whether the firm is owned by a foundation or other shareholders.

2.3 Identification and Simultaneity Bias

The use of accounting information for achieving causal statements is inherently difficult since, by construction, any double-entry bookkeeping system creates dependencies over the different accounting figures that are not one-directional. From a corporate governance point of view, a management has different channels to influence the company's accounting figures. This is the so-called (real) earnings management. There are many examples that show that there are interdependencies of accounting figures. For instance, a balance sheet contraction without changing the equity capital lowers leverage which is defined as debt divided by total assets and raises return on assets. A firm can do so by selling receivables, so-called factoring. Another example is that a firm's management might have a target leverage ratio. On the other hand, Welch (2004) finds that stock returns can explain a substantial proportion of leverage dynamics. Also, a firm that is particularly indebted to its employees might be interested in publishing high personnel expense ratios on a regular basis. Thus, such a firm might be willing to earn lower returns and get more employees' satisfaction instead. There are many more examples showing that potentially everything depends on everything when dealing with accounting data.

For illustration, consider the following linear model setup. Let Y_{it} be the return on assets, X_{it} the standard deviation of the return on assets, and Z_{it} the leverage of firm i in year t. In the following, we impose without loss of generality that all variables have a mean of zero. For simplicity, assume all firms are observed over the time period $t = 1, \ldots, T$. Let the structural mechanism be described by the following model

$$
\begin{aligned}
Y_{it} &= X_{it}\beta + Z_{it}\gamma + \varepsilon_{it},\\
Z_{it} &= X_{it}\alpha + Y_{it}\delta + u_{it}
\end{aligned}
$$

with all errors being orthogonal to the contemporaneous X_{it} and not correlated across equations. The latter assumption could be easily relaxed. In the data at hand, the risk measure is unobservable on a yearly basis but a standard deviation of the return on assets can be computed ex post and used as an average measure of risk. The model averaging all variables within firm over time looks as follows

$$
\begin{aligned}
\bar{Y}_i &= \bar{X}_i\beta + \bar{Z}_i\gamma + \bar{\varepsilon}_i,\\
\bar{Z}_i &= \bar{X}_i\alpha + \bar{Y}_i\delta + \bar{u}_i.
\end{aligned}
$$

Assume we are interested in the structural parameters of the first equation. Ignoring the simultaneity of Z_{it} and Y_{it}, we could run an OLS regression for the first equation. One can show that the estimators for β and γ do not converge to the true parameters, i.e., under some mild regularity conditions it holds that

$$
\begin{aligned}
\hat{\beta} &\xrightarrow{p} \frac{\beta + \alpha\gamma}{1-\delta\gamma} + \left[\frac{\rho_{X,Z}}{\sigma_X\sigma_Z}\right]\frac{\gamma\sigma_u^2 + \delta\sigma_\varepsilon^2}{(1-\rho_{X,Z}^2)(1-\delta\gamma)^2}\\
\hat{\gamma} &\xrightarrow{p} \frac{\gamma\sigma_u^2 + \delta\sigma_\varepsilon^2}{(1-\rho_{X,Z}^2)\sigma_Z^2(1-\delta\gamma)^2}
\end{aligned}
$$

assuming that $(1-\delta\gamma) \neq 0$, $|\rho_{XZ}| < 1$ with σ_L^2 being the variance of a random variable L, $\sigma_{L,S}^2$ the covariance between two random variables L and S, and $\rho_{L,S}$ their correlation coefficient. All formal statements for the assumptions as well as proofs and derivations can be found in Appendix 2.A.

Hence, depending on the type of simultaneity that is determined by the signs and size of the parameters, we would over- or underestimate the true structural relationships in a nontrivial fashion. To overcome this issue, we propose to exploit the persistence of firm policy variables as an identification strategy. In particular for leverage ratios, Lemmon et al. (2008) and Hanousek and Shamshur (2011) find historically strong persistence even over several decades. Assume leverage can be observed in a year $t = 0$ prior to the period for which we average the return on assets. To put persistence into a model, say that the dynamics of leverage are appropriately captured by a stationary AR(1) structure, i.e., we have that

$$Z_{it} = \theta Z_{it-1} + \nu_{it} \Leftrightarrow Z_{it} = Z_{i0}\theta^t + \sum_{j=0}^{t-1} \theta^j \nu_{it-j}$$

with ν_{it} being some independent zero mean error. This could be easily relaxed and merely serves illustrative purposes. Taking averages for the leverage over $t = 1, \ldots, T$ yields

$$\begin{aligned} \bar{Z}_i &= Z_{i0}\frac{1}{T}\sum_{t=1}^{T}\theta^t + \frac{1}{T}\sum_{t=1}^{T}\sum_{j=0}^{t-1}\theta^j \nu_{it-j} \\ &\equiv Z_{i0}\Theta + N_i. \end{aligned}$$

Using the lagged leverage as regressor, leads to the following model

$$\bar{Y}_i = \bar{X}_i\beta + Z_{i0}\omega + \mu_i$$

with $\mu_i = \bar{Z}_i\gamma - Z_{i0}\omega + \bar{\varepsilon}_i$. Assuming that simultaneity is not present across different time periods, one can show that OLS for this model yields

$$\begin{aligned} \hat{\beta} &\xrightarrow{p} \beta, \\ \hat{\omega} &\xrightarrow{p} \Theta\gamma \end{aligned}$$

and, hence, we can consistently estimate the structural parameter on the standard deviation of the return on assets. Under stationarity, we have that $|\Theta| < 1$ and, thus, our estimated coefficient for the leverage, $\hat{\omega}$, would correspond to a lower bound in absolute terms for the actual structural parameter γ. Since for leverage the AR parameter is expected to be positive, our estimates can be understood as actual lower bounds for the structural relationship. The higher the persistence in the variable, the closer the estimates are to the true parameter. In particular, $\hat{\omega}$ converges to γ if the firm policy variable follows a random walk, i.e., $Z_{it} = Z_{it-1} + \nu_{it}$.

This allows in a similar fashion for identification of the actual components or at least the lower bounds of the detailed decomposition in equation (2.2). We are aware that, for the linear model, applying the decomposition on an IV (instrumental variables) estimator, that uses the lagged policy variable as instrument, would in general be a better way how to approach the problem for the average return difference. However, the main focus of this study is the heterogeneity between low-, average-, and top-performers and, hence, the Blinder-Oaxaca decomposition serves more as a benchmark comparison to the Rothe decomposition for which the IV methodology cannot be transferred as easily as for conditional mean models.

Note that our approach can be regarded as a predictive problem as well. For instance, assume at the end of time $t = 0$ a manager would like to predict the possible effect for the next year(s) of adjusting a firm policy towards the policy of competing FoFs in the market. She can only observe her firm's and the competing firms' policy variables right now but not for the following periods. Since her decision is based on the information set in time 0, understanding the relationship between structural parameters and the actually available information can be beneficial. Using the biased results from a least squares regression for contemporaneous variables would be misleading since the estimates do not reflect the relation between today's firm policy variables and future returns. Thus, in this study, we rely on the assumption of persistence of certain firm policy variables. For instance, we assume that the leverage of today can be seen as a good proxy for the leverage of tomorrow which also appears to be backed by the literature. We use this to predict future returns. So, the manager can analyze whether an adjustment of the firm's leverage towards the leverage of FoFs might have a desired impact on the firm's return on assets.

2.4 Estimation and Inference

All Blinder-Oaxaca based models are estimated via least squares using heteroscedasticity robust standard errors. For the copula decomposition, we need to estimate the marginal distribution functions of the covariates for each group, the copula, and the conditional distribution function within the control group. We mostly follow the proposals by Rothe (2015) and estimate the marginal distributions by the empirical distribution function, i.e.,

$$\hat{F}^g_{X_l}(x) = \frac{1}{n_g} \sum_{i=1}^{n_g} \mathbb{1}(X^g_{il} \leq x)$$

with n_g being the group size of group g. For the conditional distribution function, we use a parametric approach of distributional regression (Foresi and Peracchi (1995)) which assumes that locally at a point y, it holds that $F^g_{Y|X}(y, x) \equiv \Phi(x'\delta^g(y))$ with

Φ being a strictly increasing, positive link function. Here, we use the standard normal distribution function. The parameters depend on the location of y and can be estimated by maximum likelihood, i.e.,

$$\hat{\delta}^g(y) = \arg\max_{\delta} \sum_{i=1}^{n_g} (\mathbb{1}(Y_i^g \leq y) \log(\Phi(X_i^{g\prime}\delta)) + (1 - \mathbb{1}(Y_i^g \leq y)) \log(1 - \Phi(X_i^{g\prime}\delta))).$$

Plugging in the estimate into the expression for the conditional distribution function gives the prediction. The detailed decomposition only requires estimation of the conditional distribution function for the 0 group which is very large in the data at hand. Hence, we allow for a more flexible model by including quadratic terms of all firms policy variables as well as first order interactions.

For the copula, we restrict attention to the Gaussian copula model only. This is beneficial since its parameterization requires the estimation of joint distributions for only two variables at once. Especially for estimating the copula for the FoFs with less than 110 observations, the possibly restrictive nature is required to still achieve precise estimates. Formally, assume that $C_\Sigma^g(u) = \Phi_\Sigma^K(\Phi^{-1}(u_1), \ldots, \Phi^{-1}(u_K))$ is a K-dimensional Gaussian copula with variance covariance matrix Σ. The parameterization of the copula can be done via a minimum distance approach that minimizes the squared distance between the estimated joint distribution of a pair of variables and the Gaussian copula, i.e., for a pair a, b

$$\hat{\Sigma}_{ab} = \arg\min_{\rho} \sum_{i=1}^{n_g} (\hat{F}^g_{X_a,X_b}(X^g_{ia}, X^g_{ib}) - \Phi^2_\rho(\Phi^{-1}(\hat{F}^g_{X_a}(X^g_{ai})), \Phi^{-1}(\hat{F}^g_{X_b}(X^g_{bi}))))^2$$

with

$$\hat{F}^g_{X_a,X_b}(x_a, x_b) = \frac{1}{n_g} \sum_{i=1}^{n_g} \mathbb{1}(X_a^g \leq x_a, X_b^g \leq x_b).$$

Rothe (2015) shows that under some regularity conditions in all steps, the estimate for the marginal components $\hat{\Delta}^v_M(\mathbf{k})$ of the detailed decomposition is root n asymptotically normal. The standard errors are computed using a nonparametric bootstrap that samples with replacement.

2.5 Data

We analyze accounting data of German firms for the sampling period 2004 until 2013. Accounting data is provided by Orbis. For the identification of FoFs, we refer to a list from 2012 by Marc Eulerich (University of Duisburg/Essen) that is not publicly available. This list is an updated version of the list of German FoFs in Fleschutz (2007). It comprises 740 firms. For each of these firms, we check the ownership structure. A firm is included as an FoF, if a foundation has at least two percent of the voting rights of the firm or at least two percent of the equity stake of the firm. Robustness checks with a more restrictive threshold are considered in Section 2.7.4 as well. We consider effective shares of the foundation in the foundation owned firm since there are often pyramid structures (Draheim and Franke (2015)). For most FoFs, we get data on voting rights from Orbis. If the data is not available for a particular firm, we hand-collect it using firm reports. Concerning the equity stakes, most data is provided by Hoppenstedt. Again, we hand-collect data if Hoppenstedt does not provide the desired information. In this study, we compare FoFs to firms that are not foundation owned (Nons). For a meaningful comparison, we apply several criteria for the construction of Nons that are described below and in Section 2.7.1.

We start with the collection of all German firms available in Orbis. Several data filters are applied. We exclude firms that are not for-profit. For industry classification, we use two digit US SIC codes. We do not include financial institutions (US SIC 60-64) due to special accounting conventions or firms that are part of the public authority (US SIC 91-93, 97) because in this sector we assume incentive structures to be different from the other sectors we analyze. In order to avoid outliers due to structural breaks such as a mergers or acquisitions or due to data errors, we analyze the time series of operating revenue, total assets, and the number of employees for each German firm available in Orbis. If we see a negative change of more than 50 percent or a positive change of more than 100 percent from one year to the next year, we exclude all the firm's observations (for each variable) before the most current change (Strebulaev and Yang (2013)). Similarly, if a firm switches from German accounting standards to IFRS or vice versa, then we exclude all the observations before the most current switch. All observations are deflated to the price level of 2004 using the Eurostat BIP deflator for Germany.

For our analysis, we require each firm to report operating revenue for at least two years within the sampling period 2004 to 2013. We denote the first year a firm reports operating revenue as t_0. In addition, we require each firm to report material expense, personnel expense, and shareholder funds at least for the year t_1. EBIT and total assets is required to be reported at least for the years t_2 and t_3. Thus, we require firms to report accounting figures for at least four years. All firms that do not meet these requirements are excluded. Firms that have missing values for any firm policy variable are disregarded as well. To avoid low persistence in the firm policy variables that would weaken the identification result according to Section 2.3, the age of the firms is required to be at least ten years, i.e., we exclude start-ups. This should remove extreme adjustments that are common in the first years of a firm. We consider only industries with both FoFs and Nons. That leaves us with 109 FoFs and 20260 Nons.

We use variables for our analysis that Draheim and Franke (2015) find to be significantly different for FoFs and Nons. Table 2.1 contains the description and construction of the variables we use.

Table 2.1: Description of Variables

Variable	Description	Time
RoA	Average return on assets = EBIT / total assets, financial performance measure.	$t_2 - t_{max}$
σ_{RoA}	Standard deviation of the RoA, risk measure.	$t_2 - t_{max}$
PPM	Personal expense / material expense, production policy measure.	t_1
Leverage	$1 -$ (shareholder funds / total assets), financing policy measure.	t_1
OR rank	$[0, 1]$-normalized operating revenue rank relative to all other firms at time of entrance, size measure.	t_1
OR growth	Operating revenue growth, measure of growth dynamics	$t_0 - t_1$
HGB	Indicator for whether firm uses German accounting standards or IFRS	constant
Listed	Indicator for whether firm listed at stock exchange or not	constant
Voting share	Share of foundation's voting rights	constant
Charitable	Indicator for whether foundation charitable or not	constant

This table describes the construction of the relevant variables used in this study.

We are aware of the fact that we, in general, do not use all available accounting information for a firm; several variables (PPM, Leverage, OR rank) are only analyzed for one year as Table 2.1 indicates, although we likely observe them for more years. This is due to accounting for a potential simultaneity bias as explained in Section 2.3. There is always a trade-off between information content and avoiding a simultaneity bias when using accounting data. However, we think that we do not neglect too much information following our approach. Since operating revenue is very unstable over time, i.e., non-stationary, we use as size measure OR rank. This is defined as the rank according to the size of operating revenue (1 represents the smallest firm, N represents the largest firm at t_1) divided by N. OR rank turns out to be much more stable than operating revenue itself, i.e., OR rank is persistent by construction. According to literature, leverage is also found to be persistent (e.g., Lemmon et al. (2008) and Hanousek and Shamshur (2011)). PPM turns out to be less persistent than leverage but more presistent, relative to OR growth. As explained in Section 2.3, the estimated effects get closer to the true effects, the higher persistence is. Nonetheless, estimates can be interpreted as lower bounds although the according variable does not show high levels of persistence.

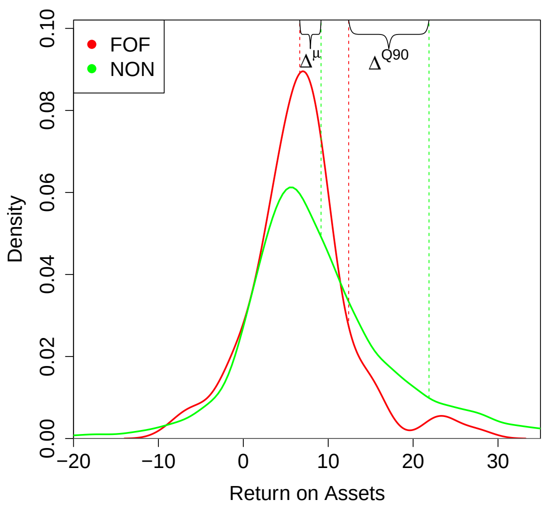
2.6 Observational Findings

Table 2.2: Untrimmed Sample Comparison

	FoF, n = 109					Non, n = 20260				
	Mean	SD	Q25	Median	Q75	Mean	SD	Q25	Median	Q75
RoA	6.650	5.792	3.608	6.689	9.169	9.132	11.663	3.444	7.496	13.395
σ_{RoA}	4.279	3.047	2.098	3.570	6.084	6.006	6.386	2.207	4.302	7.714
PPM	1.693	3.541	0.361	0.722	1.607	1.470	3.370	0.171	0.450	1.117
Leverage	0.630	0.210	0.460	0.675	0.778	0.722	0.284	0.567	0.742	0.881
OR rank	0.847	0.157	0.769	0.889	0.969	0.532	0.279	0.301	0.545	0.769
OR growth	0.068	0.135	-0.008	0.048	0.120	0.081	0.217	-0.032	0.053	0.161

This table shows summary statistics for the the return on assets (RoA) and firm policy variables for FoFs and Nons.

Figure 2.1: Density: Return on Assets



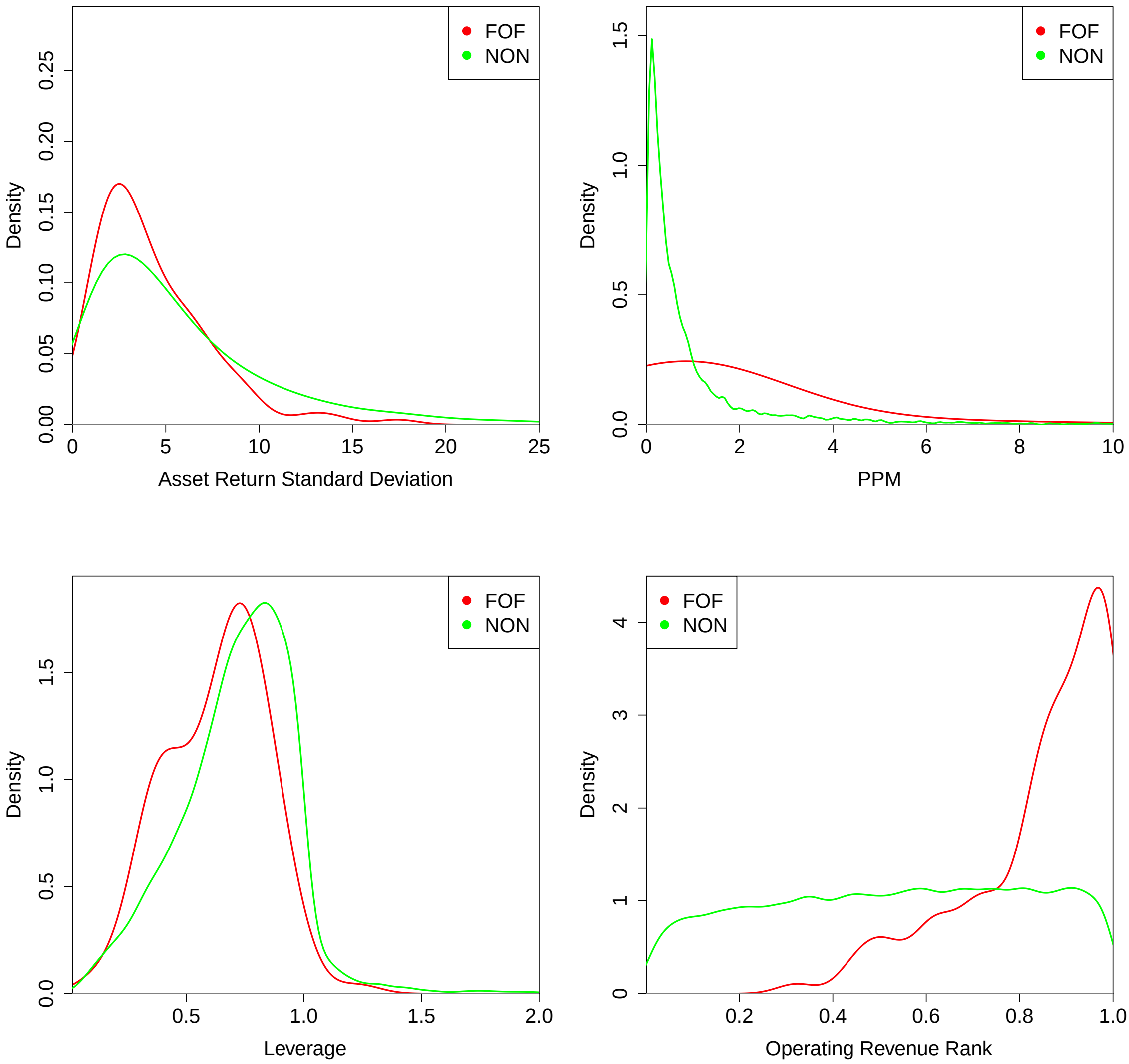
This figure shows kernel density estimates of the return on assets for FoFs and Nons. The estimates are obtained with a boundary corrected Epanechnikov kernel. Bandwidths are chosen via cross-validation.

Table 2.2 shows summary statistics for the most relevant variables of our analysis before any trimming procedure as done in Section 2.7. We report the mean, the standard deviation, the 25 percent quantile, the median, and the 75 percent quantile for each variable, separately for FoFs and Nons. We choose these values for the points at which we estimate the decompositions in Section 2.7 as well. Although results would be interesting for quantiles higher than the 75 percent quantile or lower than the 25 percent quantile, estimates at extreme quantiles are less reliable due to the small number of FoFs.

First, we consider the RoA, the outcome variable in this study, for FoFs and Nons. FoFs have a slightly higher 25 percent quantile RoA than Nons: 3.61 percent for FoFs and 3.44 for Nons. For the other quantiles as well as for the mean, the RoA is lower for FoFs. This difference seems to increase along the quantiles: the median RoA is 6.69 percent for FoFs and 7.50 percent for Nons, the 75 percent quantile RoA is 9.17 percent for FoFs and 13.40 percent for Nons. This is also depicted in Figure 2.1 which plots the RoA density function for FoFs and Nons[2]. The right tail of the density function contains more probability mass for Nons indicating more firms with high returns. As an illustration, the figure contains the return differences for the mean and the 90 percent quantile. It is very striking that the difference increases dramatically as we move to more extreme quantiles. This is one of the major motivations for a general decomposition that goes beyond the mean. A Kolmogorov-Smirnoff (KS) test on equality of the two cumulative distribution functions is rejected at $p < 0.001$.

[2] All density functions in Figure 2.1 and Figure 2.2 are estimated using a second order Epanechnikov kernel with cross-validated bandwidths.

Figure 2.2: Density: Firm Policy Variables



This figure shows kernel density estimates of σ_{RoA}, PPM, Leverage, and OR rank for FoFs and Nons. The estimates are obtained with a boundary corrected Epanechnikov kernel. Bandwidths are chosen via cross-validation.

Second, we consider several firm variables that might have an impact on the difference in RoA for FoFs and Nons. For σ_{RoA}, the picture is clear-cut. For all reported quantiles and the mean, σ_{RoA} is lower for FoFs. This difference seems to increase along the quantiles monotonically. Hence, the highest difference is for the 75 percent quantile: it is 6.08 percent for FoFs and 7.71 percent for Nons. Figure 2.2, upper left hand corner, displays the density function of σ_{RoA} for FoFs and Nons. For FoFs, there is more mass for low levels of σ_{RoA} and less mass for high levels of σ_{RoA}, relative to Nons. The findings for σ_{RoA} are consistent with the result that the standard deviation of RoA within the group of FoFs is 5.79 percent which is much lower than the standard deviation of RoA of Nons which is 11.66 percent. There is a lot of literature supporting the positive relation between risk and return of a firm, see, e.g., Glosten et al. (1993), Duffee (1995), and Bekaert and Wu (2000).

For all quantiles and the mean, labor intensity is higher in FoFs, as measured by PPM. The means for FoFs and Nons seem to be driven by some extremely labor intensive firms since they are higher than the 75 percent PPM quantiles. Figure 2.2, upper right hand corner, visualizes the finding of more labor intensity in FoFs. Draheim and Franke (2015) find that most FoFs are firms with former family ownership, i.e., family firms. Thus, FoFs share several characteristics with family firms. Bau and Chirico (2014) and Bingham et al. (2011) observe that there is a firm culture in family firms that benefits employees. More labor intensity is one channel to do so.

Leverage is consistently lower in FoFs. All reported quantities as well as Figure 2.2, lower left hand corner, support this finding. For low levels of leverage there is more mass for FoFs, while there is less mass for higher levels of leverage for FoFs. Smith (1977) argues that small firms face higher costs to issue new equity and to issue long-term debt. FoFs tend to be clearly larger than Nons (see OR rank). Thus, it is likely that Nons are more leveraged.

Summary statistics for the size, measured by OR rank, support the hypothesis that FoFs are much larger than Nons. All OR rank quantiles of FoFs are much higher than the quantiles of Nons. Figure 2.2, lower right hand corner, supports this. While the density function for Nons is flat which suggests a uniform rank distribution[3], there is a very pronounced peak at the right side of the density function for FoFs. Draheim and Franke (2015), who generate a nearest neighbor matching firm sample for 164 FoFs, match with respect to industry and size. They also find that FoFs are larger than control firms but, due to their matching approach, their observed discrepancy is not as strong as in our sample.

Concerning growth dynamics, we find that OR growth tends to be smaller for FoFs. Only for the 25 percent quantile, we find lower OR growth for Nons. This

[3]This is the case by construction since Nons make up most of the sample. Note that the ranking of operating revenue is defined before any trimming procedure is applied and hence there are some slight deviations at the boundaries.

finding for FoFs and Nons might be in line with Evans (1987) who finds a negative relationship between firm growth and size.

For all variables considered here, the KS tests reject the null of equal distributions in the covariates for FoFs and Nons with p-values below 0.001. In the subsequent section, we address the question of whether and how these significant differences translate into financial performance differences.

2.7 Results

2.7.1 Model Setup

In this section, we present the results for the decompositions of RoA differences. The decompositions are performed by using the method of Blinder (1973) and Oaxaca (1973) (this method is denoted by "BO") and of Rothe (2015) (this method is denoted by "RO"). For both methods, we estimate 7 models whereas we regard model 2 and 3 as the baseline models; the other models are included as robustness checks. The models differ in how and if they take into account OR growth, industry fixed effects, accounting standards, stock listing effects, voting share of foundations, and charity of foundations. For BO, we can only evaluate RoA differences at the mean; for RO, we evaluate RoA differences at the mean, the median, the 25 percent quantile, and the 75 percent quantile.

The construction of our variables and the assumptions for identification require some adjustments in the estimation procedures. For models that look at a restricted sample, e.g., according to accounting standards, all firms that do not fulfill this requirement are removed.

To account for the impact of the financial crisis, all models contain a time dummy indicating if the RoA time series of a firm contains the financial crisis year 2008. For firms that enter the panel after 2008 this dummy has a value of zero. Except for model 1, industry fixed effects are included. In practice, the Frisch-Waugh-Lovell results on partitioned regression (Frisch and Waugh (1933), Lovell (1963)) are used to first regress all firm policy variables and RoA on the corresponding crisis and industry dummies. Then, we take the residuals from the models as the firm policy variables and the RoA for the decomposition models. This is equivalent to demeaning all variables within industry and crisis status. In economic terms, models 2 to 7 represent a decomposition of differences in deviations from the industry (crisis) specific average RoAs and relate them to deviations from the industry (crisis) specific firm policy averages. Again, this is equivalent to modeling constant industry and crisis fixed effects for both groups simultaneously[4].

Common support adjustment is always done after controlling for any type of fixed effects or restricting the subsample which explains the slightly varying sample sizes even in the less restricted models. For all models a minima-maxima comparison[5] is applied; for each firm policy variable, we observe a minimum and a maximum for FoFs and Nons. Firms are removed that are out of the support range. A firm is out of the support range if at least one of its policy variables is smaller than the less extreme minimum of FoFs and Nons for this variable or larger than the less extreme maximum of FoFs and Nons for this variable. In practice, that only drops Nons. In addition, the sample is trimmed more severely according to OR rank. There is a single FoF that is very small. The outlier can be seen in Figure 2.2, lower right hand corner, at the left side tail of the FoFs in the OR rank category around 0.35. We remove this firm which is an extreme outlier, relative to the other FoFs. Consequently, the minima-maxima comparison is used after removing this outlier. Common support adjustment is required since else the counterfactual distribution and the corresponding decomposition terms are not well defined. In economic terms, it ensures that the characteristics of FoFs and Nons do not diverge too much which is likely to be reasonable for a meaningful comparison.

Note that, since the return on assets is an average over time, the residual variance is expected to be larger for firms that only enter the panel for a short time. Hence, to get a more efficient estimate, all observations are weighted by the number of years that are used to construct the average RoA. The same weighting scheme is applied for the copula decomposition as well. However, this generates slight deviations in the overall differences between BO and RO that can be seen in the subsequent section. We regard these differences as negligible since they are usually in the second digit after the decimal point.

[4]Note that for the copula based decomposition we are using, the within industry demeaned variables may avoid computational problems arising from a high number of industry dummies in the copula estimation.

[5]See Dehejia and Wahba (1999) in the context of propensity score trimming.

Table 2.3: Mean RO2/BO2 and RO3/BO3

Variable	BO2	RO2	BO3	RO3
Total Δ_O^v	$-1.4502^{\star\star}$	$-1.4595^{\star\star\star}$	$-1.5106^{\star\star}$	$-1.5363^{\star\star\star}$
	(0.6307)	(0.5236)	(0.6315)	(0.5582)
Structure Δ_S^v	-0.8023	-0.6591	-0.7604	-0.6509
	(0.6789)	(0.6284)	(0.6760)	(0.5833)
Composition Δ_X^v	$-0.6479^{\star\star\star}$	$-0.8005^{\star\star\star}$	$-0.7502^{\star\star\star}$	$-0.8853^{\star\star\star}$
	(0.1575)	(0.2284)	(0.1693)	(0.2316)
Dependence Δ_D^v	-	$-0.1902^{\star}$	-	-0.0841
		(0.1079)		(0.1093)
Marginal Δ_M^v	-	$-0.6103^{\star\star\star}$	-	$-0.8012^{\star\star\star}$
		(0.2052)		(0.1974)
σ_{RoA}	$-0.2933^{\star\star}$	-0.2430	$-0.2843^{\star\star}$	$-0.2890^{\star\star}$
	(0.1283)	(0.1589)	(0.1276)	(0.1357)
Leverage	$0.1166^{\star}$	$0.1498^{\star\star\star}$	$0.1233^{\star}$	0.0972
	(0.0615)	(0.0377)	(0.0651)	(0.0734)
PPM	0.0149	0.0474	0.0145	-0.0138
	(0.0198)	(0.0666)	(0.0196)	(0.0466)
OR rank	$-0.4861^{\star\star\star}$	$-0.4602^{\star\star\star}$	$-0.5053^{\star\star\star}$	$-0.5457^{\star\star\star}$
	(0.0842)	(0.0882)	(0.0861)	(0.1029)
OR growth	-	-	$-0.0983^{\star}$	$-0.1266^{\star}$
			(0.0565)	(0.0700)
FoFs	108	108	108	108
Nons	11562	11562	11151	11151

This table shows mean decomposition estimates for BO and RO for models 2 and 3. Bootstrapped standard errors are in parentheses. *, ** and *** denote 10%, 5%, and 1% significance levels.

2.7.2 Decomposition Results of the Mean Difference

In addition to separately analyzing firm policy variables that seem to be relevant for RoA differences, we analyze their impact on RoA differences when conditioning on the other variables. All statements in the subsequent sections are valid conditional on all other differences being held fixed. For the baseline specification (model 2 and 3), the firm policy variables that we investigate are σ_{RoA}, leverage, PPM, OR rank, and, in addition, OR growth for model 3. In both models, we take industry fixed effects into account as described before. Here, we look at the RoA mean difference, i.e., we decompose the difference of the mean RoA of FoFs and that of Nons into its components. Table 2.3 shows the findings for BO and RO for the models 2 and 3. BO is a benchmark for RO since it can be considered a special case of RO under linear structural functions and a zero dependence effect. Here, Nons are the reference group: e.g., a coefficient of -1.45 as total effect for BO2 corresponds to an underperformance of FoFs by 1.45 percentage points. Note that when interpreting the estimation results for BO and RO, they must always be related to the difference in the performance. Hence, e.g., a negative estimate for the marginal effect of σ_{RoA} implies that the different level of risk that FoFs take, relative to Nons, makes them perform worse in comparison.

First, we analyze BO2 and RO2. The total difference, according to BO2, is 1.45 percentage points; it is significant at the 5 percent level. This difference is the sum of differences in firm policies (composition effect) which accounts for 0.65 percentage points (highly significant), and of structural or unexplained differences (structure effect) of FoFs and Nons: 0.80 percentage points (insignificant). For RO2, the total difference is 1.46 percentage points which is highly significant. The highly significant composition effect accounts for 0.80 percentage points. The structure effect is insignificant. Dependence effect and marginal effects of firm policy variables sum up to the composition effect. The dependence effect reflects different dependence structures of the explanatory variables for FoFs and Nons. It is slightly significant. More important is the highly significant sum of the marginal effects of firm policies, the total marginal effect, which accounts for 0.61 percentage points.

Regardless of analyzing BO2 or RO2, PPM turns out to not significantly contribute to the difference in mean RoAs. According to BO2, the difference in σ_{RoA} lowers the mean RoA of FoFs by 0.29 percentage points. For RO2, the magnitude of this effect is similar but, surprisingly, insignificant. According to theory, which predicts a positive relationship between risk and return, we would expect a significantly negative effect due to consistently lower σ_{RoA} in FoFs. The effect of leverage is positive for BO2 (slightly significant) and for RO2 (highly significant). This might reflect that lower levels of leverage, which are typical for FoFs, might be beneficial regarding RoA, relative to higher levels of leverage for Nons. Size as measured by OR rank has a significantly negative effect of similar magnitude according to BO2 and RO2. FoFs are significantly larger. Potentially, large firms are subject to different constraints making them react slowlier to new market developments than small firms and, therefore, they generate relatively lower returns.

OR growth is added to the analysis in BO3 and RO3. Relative to model 2, the total effect rises by a negligible extent. The composition effect grows, whereas the structure effect remains insignificant. Thus, a larger proportion of the difference in mean RoAs can be explained by differences in firm policies. For RO3, the dependence effect is insignificant, in contrast to RO2, and the sum of marginal effects of firm policy variables is larger, relative to RO2.

We, now, turn to the impact of single firm policy variables on the total mean RoA difference for FoFs and Nons. PPM, again, turns out to be insignificant. In contrast to model 2, the effect of σ_{RoA} is significant, also for the Rothe decomposition. Here, it is negative which is in line with the well-documented positive relationship between risk and return due to lower σ_{RoA} in FoFs. The impact of leverage is not clear-cut: it is positive but only significant for BO3. As in model 2, the effect of OR rank is significantly negative. There seem to be many small Nons generating high returns even after trimming and conditioning on other firm policy variables. The impact of OR growth is slightly significantly negative for BO3 and RO3 reflecting lower financial performance due to lower growth rates in FoFs.

In general, differences at the mean between BO and RO are either a result of the dependence effect or, which is more likely here, a result of nonlinearities in the data generating process or misspecification of some models. For instance, under a correct RO specification, BO potentially overestimates the effect of leverage since our specification for BO cannot capture non-linearities. Except for RO3, the contribution of leverage at the mean seems to be positive. This suggests that the contribution of lower leverage in FoFs is beneficial for them with respect to the RoA difference. A potential mechanism here could be that Nons operate at relatively high levels of leverage, thus, restricting the funding of profitable investment opportunities. The impact of σ_{RoA} is significantly negative, except for RO2, where it is insignificant. This indicates that higher risk in Nons might lead to higher returns, in line with theory. In addition, the largest proportion of the total difference can be explained by different size of the firms. It turns out that even after conditioning on other firm policies, FoF size is detrimental to financial performance. This is potentially connected to slower adjustment processes of large firms. In addition, lower OR growth in FoFs contributes to lower mean RoA of FoFs.

One can conclude from these findings that differences in firm policy variables capture a significant proportion of return differences at the mean. Although some findings

Table 2.4: RO2: All Estimates, FoFs = 108, Nons = 11562

Variable	Q25	Median	Mean	Q75
Total Δ_O^v	0.4807	−0.2341	−1.4595***	−2.2495***
	(0.7836)	(0.6420)	(0.5236)	(0.5893)
Structure Δ_S^v	0.9594	0.3336	−0.6591	−1.0435
	(0.7976)	(0.6578)	(0.6284)	(0.6760)
Composition Δ_X^v	−0.4786***	−0.5678***	−0.8005***	−1.2060***
	(0.1720)	(0.1418)	(0.2284)	(0.2723)
Dependence Δ_D^v	−0.2688**	−0.1227*	−0.1902*	−0.1347*
	(0.1167)	(0.0684)	(0.1079)	(0.0788)
Marginal Δ_M^v	−0.2098*	−0.4451***	−0.6103***	−1.0713***
	(0.1221)	(0.1188)	(0.2052)	(0.2708)
σ_{RoA}	0.1863***	−0.1558	−0.2430	−0.6348**
	(0.0382)	(0.1010)	(0.1589)	(0.2894)
Leverage	0.1737***	0.1219***	0.1498***	0.1003
	(0.0337)	(0.0337)	(0.0377)	(0.0646)
PPM	0.1416***	0.0824*	0.0474	−0.0332
	(0.0410)	(0.0470)	(0.0666)	(0.1051)
OR rank	−0.2441**	−0.3344***	−0.4602***	−0.6621***
	(0.0962)	(0.0774)	(0.0882)	(0.1353)

This table shows decomposition estimates for RO2. Bootstrapped standard errors are in parentheses. *, ** and *** denote 10%, 5%, and 1% significance levels.

do not seem to be consistent (findings for leverage and for σ_{RoA}), we argue that, as explained before, estimated effects can be seen as lower bounds for true effects. Relying on this, the picture gets more clear-cut: lower levels of σ_{RoA}, higher levels of OR rank, and lower OR growth contribute to the mean RoA underperformance of FoFs, whereas lower levels of leverage offset this result. PPM differences do not seem to have an impact on mean RoA differences.

2.7.3 Decomposition Results of Quantile Differences

In addition to analyzing the differences in mean RoAs, the copula approach allows to conduct a detailed analysis at different quantiles. Thus, we can decompose RoA differences at different quantiles of the distributions to address potential heterogeneity. Table 2.4 shows the estimation results for model 2; Table 2.5 displays the findings for model 3 of the copula based decomposition[6]. For different quantiles, the RoA difference (”total effect”) varies. The difference seems to be the more pronounced the higher the quantile is. At the 25 percent quantile, the difference is

[6]The results for the means are already discussed in section 2.7.2 but they are included for the sake of comparability.

Table 2.5: RO3: All Estimates, FoFs = 108, Nons = 11151

Variable	Q25	Median	Mean	Q75
Total Δ_O^v	0.4235	−0.2910	−1.5363⋆⋆⋆	−2.3083⋆⋆⋆
	(0.8581)	(0.5648)	(0.5582)	(0.6391)
Structure Δ_S^v	0.8703	0.3667	−0.6509	−0.9990
	(0.8370)	(0.5756)	(0.5833)	(0.6504)
Composition Δ_X^v	−0.4468⋆⋆⋆	−0.6578⋆⋆⋆	−0.8853⋆⋆⋆	−1.3092⋆⋆⋆
	(0.1602)	(0.1547)	(0.2316)	(0.2722)
Dependence Δ_D^v	−0.0773	−0.0687	−0.0841	−0.0604
	(0.0945)	(0.0622)	(0.1093)	(0.0846)
Marginal Δ_M^v	−0.3695⋆⋆⋆	−0.5891⋆⋆⋆	−0.8012⋆⋆⋆	−1.2488⋆⋆⋆
	(0.1330)	(0.1386)	(0.1974)	(0.2561)
σ_{RoA}	0.1699⋆⋆⋆	−0.1784⋆	−0.2890⋆⋆	−0.6525⋆⋆
	(0.0334)	(0.1023)	(0.1357)	(0.2586)
Leverage	0.1574⋆⋆⋆	0.0888⋆⋆	0.0972	0.0551
	(0.0370)	(0.0441)	(0.0734)	(0.1049)
PPM	0.1189⋆⋆⋆	0.0453	−0.0138	−0.0848
	(0.0383)	(0.0372)	(0.0466)	(0.0684)
OR rank	−0.2940⋆⋆⋆	−0.3660⋆⋆⋆	−0.5457⋆⋆⋆	−0.7669⋆⋆⋆
	(0.1056)	(0.0858)	(0.1029)	(0.1427)
OR growth	0.0646	−0.0416	−0.1266⋆	−0.2569⋆⋆⋆
	(0.0530)	(0.0567)	(0.0700)	(0.0823)

This table shows decomposition estimates for RO3. Bootstrapped standard errors are in parentheses. ⋆, ⋆⋆ and ⋆⋆⋆ denote 10%, 5%, and 1% significance levels.

even positive (indicating overperformance of FoFs) but insignificant. The difference in median RoAs is negative but insignificant. For the mean and the 75 percent quantile, the difference is significantly negative. These findings hold true for RO2 and RO3. Apparently, there seem to be some high-performing Nons driving the RoA difference at high quantiles. On the other hand, the return difference gets insignificant at low quantiles.

The composition effect seems to increase monotonically in absolute terms along the quantiles. It is always highly significant. This is confirmed by RO2 and RO3. While the dependence effect is slightly significant and negative at all quantiles for RO2, its significance vanishes when considering RO3 where OR growth is included as additional firm policy variable. The total marginal effect seems to be more relevant: except for the 25 percent quantile when regarding RO2 where it is slightly significant, it is highly significant for all the other quantiles, irrespective of RO2 or RO3. In absolute terms, it increases monotonically along the quantiles.

When analyzing the marginal effects of the firm policy variables, we find that the effect of differences in σ_{RoA} is decreasing monotonically along the quantiles: at the 25 percent quantile it is significantly positive for RO2 and RO3, at the median it is negative and slightly significant for RO3 and insignificant for RO2, at the 75 percent quantile it is significantly negative for RO2 and RO3. This might indicate that, even conditional on other policy variables, FoFs follow more stable firm policies, i.e., they are not willing to take a lot of risk. On the one hand, this might restrict high levels of RoA (see underperformance of FoFs at the 75 percent quantile). On the other hand, this also might avoid very low RoA levels (see (insignificant) overperformance of FoFs at the 25 percent quantile). Concerning the leverage, we find that its effect decreases along the quantiles: leverage has the strongest positive and most significant impact at the 25 percent quantile for RO2 and RO3, at the median it is still positve and highly significant for RO2 and significant for RO3, at the 75 percent quantile significance vanishes. This suggests that typically lower levels of leverage offset the effect of other firm policy variables that are disadvantageous for FoFs in terms of financial performance for lower quantiles but do not matter for higher quantiles. Apparently, at lower quantiles, firms with a lower leverage (FoFs) have more scope to invest into profitable investments, whereas highly indebted firms are restricted to do so. For high-performing firms a high leverage might not represent a source of investment restriction. The impact of PPM is highly significant at the 25 percent quantile for RO2 and RO3, it is slightly significant at the median for RO2. Whenever it is significant, its sign is positive. Thus, for low quantiles, stronger substitution of raw material by labor seems to contribute to better financial performance of FoFs. For size, as measured by OR rank, the findings are clear-cut: its effect is highly significant (except for the 25 percent quantile when analyzing RO2, where it is only significant at the 5 percent level) and increases monotonically in absolute terms along the quantiles. The bigger size of FoFs, as measured by OR rank, seems to be a disadvantage for FoFs in terms of financial performance. There seem to be small or medium size Nons generating high returns and, thus, driving the RoA difference. This is consistent with the finding of Banz (1981) who documents that small firms have higher risk-adjusted stock returns than larger firms. OR growth is only included in RO3. Its effect is insignificant, except for the 75 percent RoA difference where it is highly significant and negative. Different growth rates of FoFs and Nons - on average, they are higher for Nons - might drive the RoA difference for high-performing FoFs and Nons.

Overall, the RoA difference for high-performing FoFs and Nons (75 percent quantile) is driven by differences in σ_{RoA}, OR rank, and OR growth. Apparently, there are several Nons that take more risk, are smaller and, thus, more dynamic, and grow faster than FoFs which results in the large RoA discrepancy. For average performers (median), there is an underperformance of FoFs which is insignificant. Still, size differences, as measured by OR rank, have a negative impact on FoF performance. This effect is partly offset by different levels of leverage in FoFs. It is likely that generally lower levels of leverage in FoFs lead to more freedom regarding investment opportunities, in contrast to being restricted by too much debt which might be the case for Nons. For low-performing FoFs and Nons, there is even underperformance of Nons, but this effect is insignificant. Only differences in OR rank drive underperformance of FoFs. This effect is overcompensated by differences in σ_{RoA}, leverage, and PPM. Apparently, there are low-performing Nons having taken too much risk, as well as being exposed to a high leverage restricting further investment opportunities. The significant effect of PPM is not easy to interpret. It may be that more outsourcing, as indicated by lower levels of PPM in Nons, is not beneficial regarding RoA.

2.7.4 Robustness Checks

2.7.4.1 Setup

We perform the analysis for five additional specifications to assure robustness of the major findings in the previous subsection. In addition to estimating model 2 and 3, we estimate model 1 which is the same as model 2 without accounting for industry fixed effects. Model 4, 5, 6, and 7 are the same as model 3 but, additionally, exclude listed firms (model 4), only include firms using German accounting standards ("HGB") (model 5), HGB firms and FoFs whose owning foundations have a voting share of at least 25 percent (model 6), and HGB firms and FoFs whose owning foundations are charitable (model 7). Check marks in the corresponding tables display the specifications of the models. The discussion focuses on major differences, relative to model 2 and 3.

2.7.4.2 Mean Differences

We display the findings for the difference in mean RoAs in Table 2.6 for BO and in Table 2.7 for RO. Only for model 1, the structure effect is significant (BO) or slightly significant (RO). This is no surprise since model 1 does not take industry effects into account not capturing structural differences among certain industries.

Models 4, 5, and 6 do not display significant effects of σ_{RoA}, leverage, and OR growth. This might be a consequence of the sample restrictions leading to only few FoFs. Anyway, for RO2 and RO3, the effects of σ_{RoA} and leverage are also not always significant as seen before. But as described before, one has to be aware of the fact that the estimates displayed have to be understood as lower bounds for the true effects. Due to this, one does not need to conclude that the results are inconsistent. Based on this reasoning, we, rather, want to point to the findings of model 2 and 3 which seem to be the most appropriate models in our setup, at least with respect to the number of observations. Having this in mind, their findings do not seem to be contradicted by the other models. Anyway, the estimates of OR rank are consistent, and OR rank turns out to be the most important driver of mean RoA differences.

2.7.4.3 Quantile Differences

We display the findings for the difference in 25 percent quantile RoAs in Table 2.8, for the difference in median RoAs in Table 2.9, and for the difference in 75 percent

Table 2.6: Blinder Oaxaca Decomposition

Variable	BO1	BO2	BO3	BO4	BO5	BO6	BO7
Total Δ_O^v	$-1.9502^{\star\star\star}$	$-1.4502^{\star\star}$	$-1.5106^{\star\star}$	$-1.7708^{\star\star\star}$	$-1.6561^{\star\star}$	$-1.3043^{\star}$	$-1.5063^{\star}$
	(0.5727)	(0.6307)	(0.6315)	(0.6568)	(0.7431)	(0.7767)	(0.7935)
Structure Δ_S^v	$-1.2276^{\star\star}$	-0.8023	-0.7604	-1.1004	-0.9968	-0.7195	-1.0864
	(0.6204)	(0.6789)	(0.6760)	(0.7050)	(0.7904)	(0.8259)	(0.8389)
Composition Δ_X^v	$-0.7226^{\star\star\star}$	$-0.6479^{\star\star\star}$	$-0.7502^{\star\star\star}$	$-0.6704^{\star\star\star}$	$-0.6593^{\star\star\star}$	$-0.5847^{\star\star\star}$	$-0.4199^{\star}$
	(0.1554)	(0.1575)	(0.1693)	(0.1790)	(0.1930)	(0.2088)	(0.2260)
σ_{RoA}	$-0.3239^{\star\star\star}$	$-0.2933^{\star\star}$	$-0.2843^{\star\star}$	-0.2183	-0.1764	-0.1871	-0.1832
	(0.1201)	(0.1283)	(0.1276)	(0.1340)	(0.1456)	(0.1633)	(0.1781)
Leverage	$0.1096^{\star\star}$	$0.1166^{\star}$	$0.1233^{\star}$	0.1042	0.1166	0.1322	$0.1918^{\star\star}$
	(0.0465)	(0.0615)	(0.0651)	(0.0718)	(0.0796)	(0.0871)	(0.0927)
PPM	-0.0165	0.0149	0.0145	0.0234	0.0123	0.0176	0.0332
	(0.0217)	(0.0198)	(0.0196)	(0.0264)	(0.0207)	(0.0254)	(0.0382)
OR rank	$-0.4918^{\star\star\star}$	$-0.4861^{\star\star\star}$	$-0.5053^{\star\star\star}$	$-0.4888^{\star\star\star}$	$-0.5170^{\star\star\star}$	$-0.4894^{\star\star\star}$	$-0.4236^{\star\star\star}$
	(0.0867)	(0.0842)	(0.0861)	(0.0868)	(0.0906)	(0.0902)	(0.0909)
OR growth	-	-	$-0.0983^{\star}$	-0.0909	-0.0948	-0.0581	-0.0382
			(0.0565)	(0.0614)	(0.0716)	(0.0718)	(0.0947)
Industry	-	✓	✓	✓	✓	✓	✓
HGB	-	-	-	-	✓	✓	✓
No Listed	-	-	-	✓	-	-	-
Voting Share > 25%	-	-	-	-	-	✓	-
Charitable only	-	-	-	-	-	-	✓
FoFs	108	108	108	100	87	77	65
Nons	11406	11562	11151	10916	10170	10711	9935

This table shows decomposition estimates for BO for all the models. Bootstrapped standard errors are in parentheses. *, ** and *** denote 10%, 5%, and 1% significance levels.

Table 2.7: Copula Decomposition: Mean

Variable	RO1	RO2	RO3	RO4	RO5	RO6	RO7
Total Δ_O^v	-1.9698^{***}	-1.4595^{***}	-1.5363^{***}	-1.7539^{***}	-1.6522^{**}	-1.2342^{*}	-1.4098^{*}
	(0.5536)	(0.5236)	(0.5582)	(0.6008)	(0.6943)	(0.7002)	(0.8536)
Structure Δ_S^v	-1.1354^{*}	-0.6591	-0.6509	-1.0369	-0.9510	-0.4919	-0.7643
	(0.6182)	(0.6284)	(0.5833)	(0.6466)	(0.7351)	(0.7445)	(0.8492)
Composition Δ_X^v	-0.8344^{***}	-0.8005^{***}	-0.8853^{***}	-0.7170^{***}	-0.7012^{***}	-0.7423^{**}	-0.6454^{*}
	(0.2040)	(0.2284)	(0.2316)	(0.2068)	(0.2412)	(0.3203)	(0.3299)
Dependence Δ_D^v	-0.1816	-0.1902^{*}	-0.0841	-0.0208	0.0014	-0.1057	-0.2074^{*}
	(0.1134)	(0.1079)	(0.1093)	(0.0953)	(0.0975)	(0.1081)	(0.1150)
Marginal Δ_M^v	-0.6528^{***}	-0.6103^{***}	-0.8012^{***}	-0.6962^{***}	-0.7027^{***}	-0.6366^{**}	-0.4380
	(0.1946)	(0.2052)	(0.1974)	(0.1893)	(0.2300)	(0.3053)	(0.3099)
σ_{RoA}	-0.2806^{*}	-0.2430	-0.2890^{**}	-0.1984	-0.1871	-0.1872	-0.1398
	(0.1454)	(0.1589)	(0.1357)	(0.1253)	(0.1704)	(0.1952)	(0.1987)
Leverage	0.1716^{***}	0.1498^{***}	0.0972	0.1115	0.0919	0.1102	0.2362^{**}
	(0.0589)	(0.0377)	(0.0734)	(0.0866)	(0.0806)	(0.1021)	(0.1115)
PPM	0.0751	0.0474	-0.0138	0.0347	-0.0113	-0.0043	0.0637
	(0.0718)	(0.0666)	(0.0466)	(0.0496)	(0.0391)	(0.0476)	(0.0664)
OR rank	-0.4182^{***}	-0.4602^{***}	-0.5457^{***}	-0.4934^{***}	-0.5372^{***}	-0.5212^{***}	-0.4073^{***}
	(0.1095)	(0.0882)	(0.1029)	(0.1089)	(0.0964)	(0.0969)	(0.1014)
OR growth	-	-	-0.1266^{*}	-0.0868	-0.1203	-0.0835	-0.0120
			(0.0700)	(0.0661)	(0.0815)	(0.0869)	(0.1103)
Industry	-	✓	✓	✓	✓	✓	✓
HGB	-	-	-	-	✓	✓	✓
No Listed	-	-	-	✓	-	-	-
Voting Share > 25%	-	-	-	-	-	✓	-
Charitable only	-	-	-	-	-	-	✓
FoFs	108	108	108	100	87	77	65
Nons	11406	11562	11151	10916	10170	10711	9935

This table shows mean decomposition estimates for RO for all the models. Bootstrapped standard errors are in parentheses. *, ** and *** denote 10%, 5%, and 1% significance levels.

Table 2.8: Copula Decomposition: Q25

Variable	RO1	RO2	RO3	RO4	RO5	RO6	RO7
Total Δ_O^v	0.3958	0.4807	0.4235	0.1230	-0.7355	0.2302	0.2368
	(0.7127)	(0.7836)	(0.8581)	(0.9324)	(1.1684)	(1.0837)	(1.0410)
Structure Δ_S^v	0.7606	0.9594	0.8703	0.5186	-0.4097	0.6529	0.7302
	(0.7101)	(0.7976)	(0.8370)	(0.9103)	(1.1520)	(1.0785)	(0.9803)
Composition Δ_X^v	-0.3648^{***}	-0.4786^{***}	-0.4468^{***}	-0.3956^{**}	-0.3258^{**}	-0.4227^{**}	-0.4933^{**}
	(0.1111)	(0.1720)	(0.1602)	(0.1753)	(0.1629)	(0.1988)	(0.2172)
Dependence Δ_D^v	-0.1306^{**}	-0.2688^{**}	-0.0773	-0.0380	-0.0009	-0.0845	-0.1958^{**}
	(0.0648)	(0.1167)	(0.0945)	(0.0983)	(0.0908)	(0.0987)	(0.0946)
Marginal Δ_M^v	-0.2342^{***}	-0.2098^{*}	-0.3695^{***}	-0.3576^{**}	-0.3249^{***}	-0.3382^{**}	-0.2975
	(0.0888)	(0.1221)	(0.1330)	(0.1420)	(0.1261)	(0.1691)	(0.1824)
σ_{RoA}	0.1876^{***}	0.1863^{***}	0.1699^{***}	0.1863^{***}	0.1531^{***}	0.1634^{***}	0.1560^{***}
	(0.0480)	(0.0382)	(0.0334)	(0.0328)	(0.0303)	(0.0326)	(0.0347)
Leverage	0.0716	0.1737^{***}	0.1574^{***}	0.1811^{***}	0.1508^{***}	0.1682^{***}	0.1739^{***}
	(0.0536)	(0.0337)	(0.0370)	(0.0343)	(0.0404)	(0.0393)	(0.0457)
PPM	0.2085^{***}	0.1416^{***}	0.1189^{***}	0.1428^{***}	0.1227^{***}	0.1333^{***}	0.1618^{***}
	(0.0655)	(0.0410)	(0.0383)	(0.0404)	(0.0342)	(0.0343)	(0.0378)
OR rank	-0.1853^{**}	-0.2441^{**}	-0.2940^{***}	-0.2611^{***}	-0.2334^{**}	-0.2554^{**}	-0.2048^{**}
	(0.0749)	(0.0962)	(0.1056)	(0.0992)	(0.0925)	(0.1044)	(0.0953)
OR growth	-	-	0.0646	0.0902^{*}	0.0684	0.1021	0.1348
			(0.0530)	(0.0523)	(0.0569)	(0.0628)	(0.0824)
Industry	-	✓	✓	✓	✓	✓	✓
HGB	-	-	-	-	✓	✓	✓
No Listed	-	-	-	✓	-	-	-
Voting Share > 25%	-	-	-	-	-	✓	-
Charitable only	-	-	-	-	-	-	✓
FoFs	108	108	108	100	87	77	65
Nons	11406	11562	11151	10916	10170	10711	9935

This table shows 25 percent quantile decomposition estimates for RO for all the models. Bootstrapped standard errors are in parentheses. *, ** and *** denote 10%, 5%, and 1% significance levels.

Table 2.9: Copula Decomposition: Median

Variable	RO1	RO2	RO3	RO4	RO5	RO6	RO7
Total Δ_O^v	−0.6286	−0.2341	−0.2910	−0.5530	−0.4691	0.2934	−0.5351
	(0.5481)	(0.6420)	(0.5648)	(0.5869)	(0.8538)	(0.9394)	(1.1241)
Structure Δ_S^v	0.1565	0.3336	0.3667	0.0093	0.0552	0.8509	−0.0412
	(0.5781)	(0.6578)	(0.5756)	(0.5923)	(0.8842)	(0.9535)	(1.1153)
Composition Δ_X^v	−0.7851***	−0.5678***	−0.6578***	−0.5623***	−0.5243***	−0.5576***	−0.4940*
	(0.1561)	(0.1418)	(0.1547)	(0.1448)	(0.1618)	(0.2168)	(0.2598)
Dependence Δ_D^v	−0.1642**	−0.1227*	−0.0687	−0.0510	0.0040	−0.0566	−0.1124
	(0.0736)	(0.0684)	(0.0622)	(0.0569)	(0.0640)	(0.0668)	(0.0702)
Marginal Δ_M^v	−0.6209***	−0.4451***	−0.5891***	−0.5112***	−0.5283***	−0.5009**	−0.3815
	(0.1366)	(0.1188)	(0.1386)	(0.1396)	(0.1570)	(0.1999)	(0.2460)
σ_{RoA}	−0.2735***	−0.1558	−0.1784*	−0.1132	−0.1193	−0.1306	−0.1053
	(0.1035)	(0.1010)	(0.1023)	(0.0955)	(0.1274)	(0.1362)	(0.1564)
Leverage	0.0877**	0.1219***	0.0888**	0.1057**	0.0689	0.0889	0.1871**
	(0.0401)	(0.0337)	(0.0441)	(0.0530)	(0.0531)	(0.0648)	(0.0870)
PPM	0.0372	0.0824*	0.0453	0.0904*	0.0524	0.0735	0.1406**
	(0.0456)	(0.0470)	(0.0372)	(0.0484)	(0.0443)	(0.0522)	(0.0700)
OR rank	−0.3585***	−0.3344***	−0.3660***	−0.3452***	−0.3900***	−0.3766***	−0.3213***
	(0.0885)	(0.0774)	(0.0858)	(0.0961)	(0.0787)	(0.0775)	(0.0878)
OR growth	-	-	−0.0416	−0.0194	−0.0523	−0.0200	0.0258
			(0.0567)	(0.0503)	(0.0665)	(0.0683)	(0.0918)
Industry	-	✓	✓	✓	✓	✓	✓
HGB	-	-	-	-	✓	✓	✓
No Listed	-	-	-	✓	-	-	-
Voting Share > 25%	-	-	-	-	-	✓	-
Charitable only	-	-	-	-	-	-	✓
FoFs	108	108	108	100	87	77	65
Nons	11406	11562	11151	10916	10170	10711	9935

This table shows median decomposition estimates for RO for all the models. Bootstrapped standard errors are in parentheses. *, ** and *** denote 10%, 5%, and 1% significance levels.

Table 2.10: Copula Decomposition: Q75

Variable	RO1	RO2	RO3	RO4	RO5	RO6	RO7
Total Δ_O^v	$-3.4793^{\star\star\star}$	$-2.2495^{\star\star\star}$	$-2.3083^{\star\star\star}$	$-2.2090^{\star\star\star}$	$-2.1036^{\star\star}$	$-1.9096^{\star}$	-2.0156
	(0.5083)	(0.5893)	(0.6391)	(0.7180)	(0.8514)	(0.9784)	(1.2639)
Structure Δ_S^v	$-2.1452^{\star\star\star}$	-1.0435	-0.9990	-1.1771	-1.0633	-0.8704	-1.2152
	(0.6134)	(0.6760)	(0.6504)	(0.7502)	(0.9086)	(0.9876)	(1.3250)
Composition Δ_X^v	$-1.3341^{\star\star\star}$	$-1.2060^{\star\star\star}$	$-1.3092^{\star\star\star}$	$-1.0319^{\star\star\star}$	$-1.0403^{\star\star\star}$	$-1.0392^{\star\star}$	-0.8004
	(0.2575)	(0.2723)	(0.2722)	(0.2620)	(0.3385)	(0.4491)	(0.4902)
Dependence Δ_D^v	-0.1046	$-0.1347^{\star}$	-0.0604	0.0155	0.0046	-0.1047	$-0.2218^{\star}$
	(0.0685)	(0.0788)	(0.0846)	(0.0880)	(0.0872)	(0.1094)	(0.1286)
Marginal Δ_M^v	$-1.2295^{\star\star\star}$	$-1.0713^{\star\star\star}$	$-1.2488^{\star\star\star}$	$-1.0474^{\star\star\star}$	$-1.0449^{\star\star\star}$	$-0.9345^{\star\star}$	-0.5786
	(0.2514)	(0.2708)	(0.2561)	(0.2607)	(0.3483)	(0.4537)	(0.4726)
σ_{RoA}	$-0.7923^{\star\star\star}$	$-0.6348^{\star\star}$	$-0.6525^{\star\star}$	$-0.4960^{\star\star}$	-0.4731	-0.4790	-0.3956
	(0.2453)	(0.2894)	(0.2586)	(0.2397)	(0.3236)	(0.3642)	(0.3523)
Leverage	$0.1706^{\star\star\star}$	0.1003	0.0551	0.0718	0.0659	0.0859	$0.2586^{\star}$
	(0.0532)	(0.0646)	(0.1049)	(0.1240)	(0.1221)	(0.1639)	(0.1486)
PPM	-0.0375	-0.0332	-0.0848	-0.0240	-0.0526	-0.0335	0.0825
	(0.0927)	(0.1051)	(0.0684)	(0.0909)	(0.0777)	(0.0983)	(0.1187)
OR rank	$-0.7240^{\star\star\star}$	$-0.6621^{\star\star\star}$	$-0.7669^{\star\star\star}$	$-0.6697^{\star\star\star}$	$-0.8007^{\star\star\star}$	$-0.7243^{\star\star\star}$	$-0.5663^{\star\star\star}$
	(0.1321)	(0.1353)	(0.1427)	(0.1503)	(0.1394)	(0.1368)	(0.1362)
OR growth	-	-	$-0.2569^{\star\star\star}$	$-0.2156^{\star\star}$	$-0.2582^{\star\star}$	$-0.2116^{\star}$	-0.0975
			(0.0823)	(0.0881)	(0.1124)	(0.1120)	(0.1266)
Industry	-	✓	✓	✓	✓	✓	✓
HGB	-	-	-	-	✓	✓	✓
No Listed	-	-	-	✓	-	-	-
Voting Share > 25%	-	-	-	-	-	✓	-
Charitable only	-	-	-	-	-	-	✓
FoFs	108	108	108	100	87	77	65
Nons	11406	11562	11151	10916	10170	10711	9935

This table shows 75 percent quantile decomposition estimates for RO for all the models. Bootstrapped standard errors are in parentheses. *, ** and *** denote 10%, 5%, and 1% significance levels.

quantile RoAs in Table 2.10.

Most of the findings for the 25 percent quantile appear to be consistent for all the models. Varying significance levels of the dependence effect are one exception. The total marginal effect is not significant for model 7, in contrast to the other models. The findings for σ_{RoA}, leverage, PPM, and OR rank seem to be consistent; only for model 1, leverage is insignificant. Model 4 is the only model where OR growth is at least slightly significant.

For median RoAs, the findings are not clear-cut. Only for model 1 and 2, the dependence effect is significant or slightly significant, respectively. Model 7 is the only model whose total marginal effect is insignificant, possibly due to the small number of FoFs taken into account. Only for model 1 and 3 the impact of σ_{RoA} is negative and (slightly) significant. Leverage turns out to be significantly positive, except for model 5 and 6. The picture for PPM is not clear-cut at all. Again, OR rank turns out to be highly significant and negative for all models. We remind of the fact that estimated effects are lower bounds (in absolute terms) for the true effects. Considering this and observing that the signs of the estimates are consistent, we conclude that the findings for the different models might support consistency.

The picture looks similar for the 75 percent quantile. For model 7, we do not find a significant total effect; the composition effect is insignificant, while the dependence effect is slightly significant. Besides, we see a highly significant structure effect for model 1, possibly due to not taking industry fixed effects into account moving the additional heterogeneity to the unexplained or structural component. σ_{RoA} is insignificant for model 5, 6, and 7. Leverage turns out to be positive and highly significant for model 1 and slightly significant for model 7. The effect for PPM is insignificant for all models, while the effect of OR rank is significantly negative for all models. Except for model 7, OR growth turns out significant and negative. Again, we refer to the fact that these estimates have to be interpreted as lower bounds of the true effects. Taking this into consideration and observing consistent signs of estimated firm policy effects across the models, we believe that these findings support the findings of baseline models 2 and 3.

2.8 Conclusion

In this paper, we study if and how differences in firm policies have an impact on differences in return on assets of FoFs and Nons. We perform the analysis for return differences at the mean and at several quantiles. We document that for high-performing FoFs and Nons the RoA difference is more pronounced in favor of Nons, for low-performing firms the difference vanishes. Performance differences are substantially driven by differences in firm policies. We find that (1) lower risk in FoFs, as measured by the standard deviation of return on assets, increases FoF underperformance at high quantiles, but offsets it at low quantiles, (2) a lower leverage of FoFs offsets FoF underperformance at low quantiles and the median, (3) higher labor intensity in FoFs offsets their underperformance at low quantiles, (4) the larger size of FoFs increases FoF underperformance for the mean and all quantiles, (5) lower growth rates of FoFs increase FoF underperformance at high quantiles, and (6) residual differences beyond firm policies tend to be insignificant.

Managers of FoFs might be less incentivized to take higher risk which is likely to be a driver of lower but more stable returns in FoFs, while there seem to be several Nons generating very high returns. A lower leverage in FoFs appears to give more scope to new investment opportunities and, thus, partly offsets the performance disadvantage of FoFs. More labor intensity in FoFs might be interacted with less outsourcing. Possibly, some Nons have overdone outsourcing reducing the performance gap. The larger size of FoFs involves less flexibility and lower adjustment to new market conditions resulting to higher RoA difference. Slower growth of FoFs might translate into lower returns.

By the construction of the variables we try to mitigate the simultaneity bias adherent in accounting information. We show that under this potential bias estimates have to be interpreted as lower bounds for true effects. The more persistent the variables are, the closer the estimates get to true effects.

This study might contribute to a better understanding about the impact of today's firm policies on future returns since it can be interpreted as a predictive approach due to the construction of the variables. As far as it is possible, a manager of a Non might adjust a certain variable towards the level which can be observed in FoFs for this variable and vice versa in order to push future returns into the desired direction.

Further studies on the relationship between present firm policies and future returns combined with conversations with practitioners might deepen our understanding.

Appendix 2.A Parameter Proofs

The models for the time averages are given by

$$\begin{aligned} \bar{Y}_i &= \bar{X}_i\beta + \bar{Z}_i\gamma + \bar{\varepsilon}_i, \\ \bar{Z}_i &= \bar{X}_i\alpha + \bar{Y}_i\delta + \bar{u}_i. \end{aligned}$$

Let the model stacked over all observations be denoted as

$$\begin{aligned} Y &= X\beta + Z\gamma + \varepsilon, \\ Z &= X\alpha + Y\delta + u \end{aligned}$$

with all elements being vectors of size n and all parameters being scalars. We assume that $E[\bar{X}_i\bar{\varepsilon}_i] = E[\bar{X}_i\bar{u}_i] = 0$ and without loss of generality that all variables have mean zero, i.e., are centered. For the sake of simplicity we assume that the errors are uncorrelated across equations. In addition, we assume the usual regularity conditions to assure that all empirical correlation and variance covariance matrices converge to a fixed matrix in probability. In the following, we derive the probability limits for the least squares estimation of β and γ. One can rewrite the outcomes as

$$\begin{aligned} Y &= X\beta + Z\gamma + \varepsilon \\ &= X\beta + (X\alpha + Y\delta + u)\gamma + \varepsilon \\ \Leftrightarrow Y &= X\left(\frac{\beta + \alpha\gamma}{1-\delta\gamma}\right) + u\left(\frac{\gamma}{1-\delta\gamma}\right) + \varepsilon\left(\frac{1}{1-\delta\gamma}\right) \\ \Rightarrow Z &= X\left(\frac{\alpha + \beta\delta}{1-\delta\gamma}\right) + u\left(\frac{1}{1-\delta\gamma}\right) + \varepsilon\left(\frac{\delta}{1-\delta\gamma}\right). \end{aligned}$$

Let for any n times k dimensional matrix W the residual maker matrix be defined as $M_W = I - W(W'W)^{-1}W'$, σ^2_L be the variance of a random variable L, $\sigma^2_{L,S}$ the covariance between two random variables L and S, and $\rho_{L,S}$ their correlation coefficient. The closed form solution for the least squares estimate of β is given by

$$\begin{aligned}
\hat{\beta} &= (X'M_ZX)^{-1}X'M_ZY \\
&= (X'M_ZX)^{-1}X'M_ZX\left(\frac{\beta+\alpha\gamma}{1-\delta\gamma}\right) + (X'M_ZX)^{-1}X'M_Z\left[u\left(\frac{\gamma}{1-\delta\gamma}\right)+\varepsilon\left(\frac{1}{1-\delta\gamma}\right)\right] \\
&= \left(\frac{\beta+\alpha\gamma}{1-\delta\gamma}\right) + (X'M_ZX)^{-1}\left\{X'\left[u\left(\frac{\gamma}{1-\delta\gamma}\right)+\varepsilon\left(\frac{1}{1-\delta\gamma}\right)\right]\right. \\
&\quad \left. - X'Z(Z'Z)^{-1}Z'\left[u\left(\frac{\gamma}{1-\delta\gamma}\right)+\varepsilon\left(\frac{1}{1-\delta\gamma}\right)\right]\right\} \\
&= \left(\frac{\beta+\alpha\gamma}{1-\delta\gamma}\right) + (X'X - X'Z(Z'Z)^{-1}Z'X)^{-1}\left\{X'\left[u\left(\frac{\gamma}{1-\delta\gamma}\right)+\varepsilon\left(\frac{1}{1-\delta\gamma}\right)\right]\right. \\
&\quad \left. - X'Z(Z'Z)^{-1}Z'\left[u\left(\frac{\gamma}{1-\delta\gamma}\right)+\varepsilon\left(\frac{1}{1-\delta\gamma}\right)\right]\right\}.
\end{aligned}$$

As auxiliary result we use that

$$\begin{aligned}
n^{-1}Z'u &= n^{-1}X'u\left(\frac{\alpha+\beta\delta}{1-\delta\gamma}\right) + n^{-1}u'u\left(\frac{1}{1-\delta\gamma}\right) + n^{-1}\varepsilon'u\left(\frac{\delta}{1-\delta\gamma}\right) \xrightarrow{p} \frac{\sigma_u^2}{1-\delta\gamma} \\
n^{-1}Z'\varepsilon &= n^{-1}X'\varepsilon\left(\frac{\alpha+\beta\delta}{1-\delta\gamma}\right) + n^{-1}u'\varepsilon\left(\frac{1}{1-\delta\gamma}\right) + n^{-1}\varepsilon'\varepsilon\left(\frac{\delta}{1-\delta\gamma}\right) \xrightarrow{p} \frac{\delta\sigma_\varepsilon^2}{1-\delta\gamma}
\end{aligned}$$

and hence by multiplying and dividing through with n it follows that

$$\begin{aligned}
\hat{\beta} &\xrightarrow{p} \frac{\beta+\alpha\gamma}{1-\delta\gamma} + \left(\sigma_X^2 - \frac{\sigma_{X,Z}^2}{\sigma_Z^2}\right)^{-1}\frac{\sigma_{X,Z}}{\sigma_Z^2}\left[\frac{\gamma\sigma_u^2+\delta\sigma_\varepsilon^2}{(1-\delta\gamma)^2}\right] \\
&= \frac{\beta+\alpha\gamma}{1-\delta\gamma} + \left[\frac{\rho_{X,Z}}{\sigma_X\sigma_Z}\right]\frac{\gamma\sigma_u^2+\delta\sigma_\varepsilon^2}{(1-\rho_{X,Z}^2)(1-\delta\gamma)^2}.
\end{aligned}$$

With the intermediary step from above one can show that the OLS estimate of γ yields

$$\begin{aligned}
\hat{\gamma} &= (Z'M_XZ)^{-1}Z'M_XY \\
&= (Z'M_XZ)^{-1}Z'[Y - X(X'X)^{-1}X'Y] \\
&= (Z'M_XZ)^{-1}\left\{\left[Z'X\left(\frac{\beta+\alpha\gamma}{1-\delta\gamma}\right) + Z'u\left(\frac{\gamma}{1-\delta\gamma}\right) + Z'\varepsilon\left(\frac{1}{1-\delta\gamma}\right)\right]\right. \\
&\quad \left. - Z'X(X'X)^{-1}\left[X'X\left(\frac{\beta+\alpha\gamma}{1-\delta\gamma}\right) + X'u\left(\frac{\gamma}{1-\delta\gamma}\right) + X'\varepsilon\left(\frac{1}{1-\delta\gamma}\right)\right]\right\} \\
&= (Z'M_XZ)^{-1}\left[Z'u\left(\frac{\gamma}{1-\delta\gamma}\right) + Z'\varepsilon\left(\frac{1}{1-\delta\gamma}\right)\right. \\
&\quad \left. - Z'X(X'X)^{-1}\left\{X'u\left(\frac{\gamma}{1-\delta\gamma}\right) + X'\varepsilon\left(\frac{1}{1-\delta\gamma}\right)\right\}\right].
\end{aligned}$$

Using the identification and convergence assumptions and plugging in Z, we obtain

$$\begin{aligned}
\hat{\gamma} &= (Z'M_XZ)^{-1}\left[\frac{\gamma}{1-\delta\gamma}Z'u + \frac{1}{1-\delta\gamma}Z'\varepsilon\right] + o_p(1) \\
&= (Z'M_XZ)^{-1}\left[\frac{\gamma}{1-\delta\gamma}\left\{X'u\left(\frac{\alpha+\beta\gamma}{1-\delta\gamma}\right) + u'u\left(\frac{1}{1-\delta\gamma}\right) + \varepsilon'u\left(\frac{\delta}{1-\delta\gamma}\right)\right\}\right. \\
&\quad \left. + \frac{1}{1-\delta\gamma}\left\{X'\varepsilon\left(\frac{\alpha+\beta\gamma}{1-\delta\gamma}\right) + u'\varepsilon\left(\frac{1}{1-\delta\gamma}\right) + \varepsilon'\varepsilon\left(\frac{\delta}{1-\delta\gamma}\right)\right\}\right] + o_p(1) \\
&= (Z'M_XZ)^{-1}\left[\frac{\gamma}{(1-\delta\gamma)^2}u'u + \frac{\delta}{(1-\delta\gamma)^2}\varepsilon'\varepsilon\right] + o_p(1) \\
&= (Z'Z - Z'X(X'X)^{-1}X'Z)^{-1}\left[\frac{\gamma}{(1-\delta\gamma)^2}u'u + \frac{\delta}{(1-\delta\gamma)^2}\varepsilon'\varepsilon\right] + o_p(1)
\end{aligned}$$

and hence it follows that

$$\begin{aligned}
\hat{\gamma} &\xrightarrow{p} \left[\sigma_Z^2 - \frac{\sigma_{X,Z}^2}{\sigma_X^2}\right]^{-1}\frac{\gamma\sigma_u^2 + \delta\sigma_\varepsilon^2}{(1-\delta\gamma)^2} \\
&= \frac{\gamma\sigma_u^2 + \delta\sigma_\varepsilon^2}{(1-\rho_{X,Z}^2)\sigma_Z^2(1-\delta\gamma)^2}.
\end{aligned}$$

Now, consider the auxiliary model with lagged regressors Z_{i0} assuming that the prior values are not subject to simultaneity bias, i.e., $E[Z_{i0}\bar{\varepsilon}_i] = E[Z_{i0}\bar{u}_i] = 0$. Let Z_0 be the stacked vector of the predetermined regressors. To put persistence into a model, say that the dynamics of leverage are appropriately captured by a stationary AR(1) structure, i.e., we have that

$$Z_{it} = \theta Z_{it-1} + \nu_{it} \Leftrightarrow Z_{it} = Z_{i0}\theta^t + \sum_{j=0}^{t-1}\theta^j\nu_{it-j}$$

with ν_{it} being some independent zero mean error. This could be easily relaxed and merely serves illustrative purpose. Taking averages for the leverage over $t = 1, \ldots, T$ yields

$$\begin{aligned}
\bar{Z}_i &= Z_{i0}\frac{1}{T}\sum_{t=1}^{T}\theta^t + \frac{1}{T}\sum_{t=1}^{T}\sum_{j=0}^{t-1}\theta^j\nu_{it-j} \\
&\equiv Z_{i0}\Theta + N_i \\
\Leftrightarrow Z &= Z_0\Theta + N.
\end{aligned}$$

Therefore, the auxiliary model for estimation is given by

$$Y = X\beta + Z_0\omega + \nu$$

with $\nu = \varepsilon - Z_0\omega + Z\gamma$. Using the additional orthogonality condition as well as the independence of the error in the autoregressive model, one can derive the probability limits for the least squares estimator of the auxiliary model parameters

$$\begin{aligned}
\hat{\beta} &= (X'M_{Z_0}X)^{-1}X'M_{Z_0}Y \\
&= (X'M_{Z_0}X)^{-1}X'M_{Z_0}(X\beta + Z\gamma + \varepsilon) \\
&= \beta + (X'M_{Z_0}X)^{-1}X'M_{Z_0}Z\gamma + (X'M_{Z_0}X)^{-1}X'M_{Z_0}\varepsilon \\
&= \beta + (X'M_{Z_0}X)^{-1}X'M_{Z_0}(Z_0\Theta + N)\gamma + (X'M_{Z_0}X)^{-1}X'M_{Z_0}\varepsilon \\
&= \beta + (X'M_{Z_0}X)^{-1}X'M_{Z_0}(N\gamma + \varepsilon) \\
&\xrightarrow{p} \beta.
\end{aligned}$$

Hence, we can estimate β consistently. For the new parameter ω on the lagged regressor one obtains that

$$\begin{aligned}
\hat{\omega} &= (Z_0'M_XZ_0)^{-1}Z_0M_XY \\
&= (Z_0'M_XZ_0)^{-1}Z_0M_X(X\beta + Z\gamma + \varepsilon) \\
&= \Theta\gamma + (Z_0'M_XZ_0)^{-1}Z_0M_X(N\gamma + \varepsilon) \\
&\xrightarrow{p} \Theta\gamma
\end{aligned}$$

which under stationarity is an absolutely lower bound for the effect size γ from the true structural equation which completes the proof.

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Chapter 3

For-Profit Foundation Owned Firms and Non-Profit Firms - The Intensity of the Profit Motive Matters

3.1 Introduction

For-profit firms are usually owned by individual or institutional investors. Primarily, they own firms hoping to earn income. Thus, they are likely to push managers for profits. In other words, the profit motive of these owners is usually pronounced. In many countries, there exists also a big non-profit sector. Non-profit firms are usually active in industries that provide complex personal services, such as health services, nursing services, and education. They less frequently operate in industries where highly standardized goods are produced. Non-profit firms are defined by the infeasibility to allocate net earnings to owners[1], managers, directors, and all other stakeholders that are not favored by the purpose the firm has been set up for (Hansmann (1980)). Net earnings have to be spent for the firm's purpose which is in general for the public benefit. This weakens the profit motive in non-profit firms.

At the same time, in some countries, in particular in Denmark and Germany, several big profit-oriented firms, including Aldi, Bosch, Carlsberg, Mærsk, ThyssenKrupp, and ZF Friedrichshafen, are fully or partly owned by foundations. Foundations are legal entities without owners; their income has to be spent for purposes defined in the foundation charter. Such purposes are often charitable. In this setup, a natural person being a residual claimant may be absent. A weaker profit motive relative to other profit-oriented firms, but stronger relative to non-profit firms is likely[2]. Thus, different ownership setups might be associated with different intensities of the profit motive across firms. What is the impact of different intensities of the profit motive on firm policies and financial performance?

There is a rich literature on the comparison of for-profit and non-profit firms that are not foundation owned, as well as on the comparison of for-profit firms that are foundation owned to those with other owners. I focus on for-profit foundation owned firms and non-profit firms and ask how they differ in terms of firm policies and financial performance using accounting information for German firms. An empirical analysis of these firms based on theoretical conjectures is the main contribution of the paper. First, I find that non-profit firms do not differ in the

[1]For non-profit firms, I call them "sponsors" (German: "Träger") in order to account for the fact that they provide money for firms but do not get dividends.

[2]For more legal details of foundation owned firms see, e.g., von Campenhausen and Richter (2014). For more details concerning the institutional background of German foundation owned firms see Draheim and Franke (2015).

analyzed firm policies and performance measures, regardless of being owned by a foundation or not. Hence, for the comparison of for-profit foundation owned firms and non-profit firms, I do not differentiate between non-profit firms that are foundation owned and those that are not. Second, I find that non-profit firms, relative to for-profit foundation owned firms, (1) have a lower leverage, (2) operate more labor-intensively, and (3) their financial performance, measured by the return on assets, is lower but also less volatile. Still their risk-adjusted financial performance is lower.

These findings may be explained through two channels which are due to a weaker profit motive in non-profit firms. Firstly, managers of non-profit firms are likely less rewarded for profits than their for-profit counterparts. Secondly, non-profit firms, that serve charitable purposes, are often more highly regarded in the public than for-profit firms. Therefore, sponsors of non-profit firms face higher reputational costs if a non-profit firm runs into financial distress than owners of for-profit firms. Less rewards for profits and more fear of financial distress might lead to risk-reducing firm policies aiming to achieve a stable development of a firm, i.e., to lower volatility of returns. A lower leverage might lower a firm's risk of financial distress. On the downside, generating more stable returns, is usually associated with lower returns. Additionally, I find that, even after controlling for industry effects, non-profit firms produce more labor-intensively. Due to the non-profit orientation and due to more public attention, managers of non-profit firms might be averse to painful firings. In addition, they may be less incentivized to reduce the workforce in order to cut personnel expense.

In the research area of non-profit firms, the work of Hansmann (1980) and Hansmann (1996) is a cornerstone. He is the first to formally define non-profit firms (see Section 3.2.1). Their existence may be explained by the inability of incomplete contracts to police producers in industries where the quality of a good is difficult to control. In this situation, non-profit firms appear more trustworthy. Glaeser and Shleifer (2001) recap the arguments by Hansmann and set up a formal model for the existence of non-profit firms. Chang and Tuckman (1990) analyze accounting data of US non-profit firms and find that managers seek profits in order to raise the equity base of the firm. Accumulating surpluses is seen as a measure of financial success, a hedge against uncertainty and risk, and can strengthen independence from market competition. Thomsen (2014) hypothesizes that non-profit firms have a lower leverage than for-profit firms since they are eager to accumulate capital reserves in order to prevent bankruptcy. Sloan and Steinwald (1980) compare US for-profit and non-profit hospitals and find that non-profit hospitals use more labor input and less non-labor input. Hoerger (1991) analyzes financial data of US hospitals and finds that the profits of non-profit hospitals are exposed to less variability compared to for-profit hospitals.

There exist several studies comparing for-profit foundation owned firms to other for-profit firms for Denmark and Germany. Thomsen (1996), Thomsen (1999), and Thomsen and Rose (2004) compare Danish foundation owned firms to the largest 150 Danish not foundation owned firms, to firms with dispersed ownership or family ownership, and to firms listed at the Copenhagen Stock Exchange, respectively. They find that foundation owned firms do not perform worse. Hansmann and Thomsen (2013) study foundation owned firms only and analyze the personal overlap between the boards of the foundations and the boards of the owned firms, outside ownership, and administrative independence of the foundations from the firms. They find that financial performance improves if the distance between firms and foundations grows in these three dimensions. Børsting et al. (2013) analyze the capital structure of Danish firms and find that foundation owned firms operate with lower leverage than other firms.

For Germany, Herrmann and Franke (2002) find a slightly better financial performance of foundation owned firms. Their control group consists of firms being listed at a stock exchange. They also find higher labor intensity in foundation owned firms. Draheim and Franke (2015) extend the latter study by analyzing a larger sample of foundation owned firms, having a longer sampling period, and taking into account the heterogeneous institutional background of foundation owned firms. They find that foundation owned firms, in comparison to firms matched by industry and size, have a more conservative financing policy in terms of leverage and payout policy, are more labor-intensive, their financial performance, measured by return on assets, and the standard deviation of return on assets is lower, but their risk-adjusted financial performance is not significantly different.

The paper is structured as follows. The next section serves as an introduction to non-profit firms. Then, I derive hypotheses based on the comparison of foundation owned firms and non-profit firms. The subsequent section presents the data and summary statistics. In the following section, I present findings for the comparison of non-profit foundation owned firms and non-profit firms with other sponsors. After showing the findings for the comparison of non-profit firms and for-profit foundation owned firms, the paper concludes.

3.2 Institutional Background of the Non-Profit Sector

3.2.1 Definition, Sponsors, and Tax-Exemption

According to the definition of Hansmann (1980), non-profit firms are firms that may earn profits but are not allowed to distribute net earnings to sponsors, directors, managers, or other stakeholders. Net earnings are entirely to be used for the purpose the firm has been set up for[3]. This crucial property is the so-called "non-distribution constraint". In other words, the profit motive is restricted, but not making profits itself.

I call the owners of non-profit firms "sponsors". This notation is supposed to account for the fact that the non-profit firms' owners provide money to the firms but do not get any dividends due to the non-distribution constraint. However, mainly due to the threat of reputational loss, sponsors would typically help out in the case of financial distress of the non-profit firm; e.g., a mayor might lose reputation if she had to announce the closing of the municipal hospital[4]. Thus, sponsors have some interest that non-profit firms make profits as a buffer for future losses or for future investments, but this profit motive is likely weaker than that of owners of for-profit firms. Important examples of sponsors are churches and related public benefit-associations, local public authorities, and welfare associations.

Most non-profit firms in Germany are tax-exempt. The German tax code defines firm purposes which are recognized as charitable/for the public benefit and, thus, imply tax-exemption. Charitable firms do not pay corporate taxes. Local tax

[3] In general, the purpose of a non-profit firm is for the public benefit.

[4] Horwitz (2005a) finds that "under financial pressure, for-profit hospitals are more likely to close or restructure than nonprofits" (p. 96).

authorities decide on the recognition as a charitable organization. A typical legal form that many non-profit firms share is the gGmbH - charitable company with limited liability. Most firms we analyze in this study have this legal form. Without endangering tax-exemption, a charitable firm may distribute net earnings to other charitable organizations.

Hansmann (1980) states that the privilege of tax-exemption of non-profit firms is far less important than often assumed. Firstly, he argues that tax-exemption has not spurred the non-profit sector. Rather, it is the non-profit sector that has driven and still drives tax legislation, including the definition of purposes allowing for tax-exemption. Secondly, he finds empirical evidence that there are several (sub-)industries where non-profit firms exist but do not dominate although they are tax-exempt[5].

3.2.2 Motives for the Existence of Non-Profit Firms

It is not obvious why non-profit firms exist: low performance pressure due to the lack of owners as residual claimants and the lack of capital market control might endanger the existence of these firms. On the other hand, non-profit firms have advantages over their for-profit counterparts.

Consider a patient that is proposed a costly surgery in a for-profit hospital and a less costly treatment in a non-profit hospital. In general, a patient is not able to decide which treatment turns out to be the most effective one. In order words, the patient faces information deficits due to the complex issue. This situation is normal when being concerned with complex, non-standardized services. The patient might be more willing to receive the treatment from the non-profit hospital firm that is not or less driven by monetary incentives. Less monetary incentives might avoid that unnecessary or even disadvantageous but profitable treatments are proposed[6]. This might support more trust in non-profit firms.

In general, due to information asymmetries between producers and customers, firms have incentives to charge excessive prices for (inferior) goods. This may happen

[5] In this study, differences between non-profit and for-profit firms, arising from different taxation, do not play an important role since I always consider pre-tax measures of financial performance.

[6] Horwitz (2005b) finds that it is more likely for for-profit hospitals to offer more profitable services than for non-profit hospitals. They also appear to react faster to changes in reimbursement.

when purchasing contracts are not sufficiently detailed to police producers, which is more likely for complex goods where the quality is hard to check. Since non-profit firms are barred from distributing profits (non-distribution constraint), they have less incentives to set inadequate prices. This provides some protection for the customers (Hansmann (1980), Glaeser and Shleifer (2001)). As a consequence, non-profit firms are more likely found in industries where complex personal services are offered, instead of standardized industrial goods that are easy to compare. Particularly in the health and in the education industry, non-profit firms are important players.

3.2.3 Peculiarities of the Health Industry

Many firms that I analyze are hospitals and nursing homes. Since there are several peculiarities about the health industry concerning funding and accounting, I take a deeper look into some of them. In Germany, the funding of hospitals is based on two pillars: government subsidies and hospitals' operating revenue. Government subsidies are allocated to all hospitals, regardless of being for-profit or non-profit. The amount of the subsidy depends on the size of the hospital as measured by the number of beds, number of departments, and other factors. Subsidies are to be used for long-term investments, such as new buildings, renovations, or (new) equipment. Due to special accounting rules for hospitals, these subsidies do not enter the profit and loss account of a hospital.

The operating revenue of a hospital is mainly derived from standardized services (so-called cases) that are registered in a classification catalog, the so-called Diagnosis Related Groups (DRG) system. This catalog is offered by an institute (InEK GmbH) that, based on the costs of selected German hospitals for certain surgeries and treatments, estimates average costs for each case. Estimated average costs mainly depend on the complexity of cases. Hospitals can bill health insurance companies for these estimated standard costs per patient. Since these costs are set, hospitals cannot take advantage from varying prices. Instead, they have incentives to lower production costs. But there is some room for hospitals to decide on which services to offer.

For the US, where the system is similar, Horwitz (2005b) finds that for-profit hospitals are more likely to offer services that are more profitable, i.e., services that have higher estimated standard costs. As an example, for-profit hospitals may prefer to offer open heart surgeries which are very profitable, rather than unprofitable treatments, such as psychiatric emergency care. Moreover, she finds that for-profit hospitals react more quickly and more pronounced to changes in financial incentives which might even lead to the close-down of a hospital. She rejects the hypothesis that tax-exemption of non-profit hospitals leads to a competitive advantage. Silverman and Skinner (2004) find that for-profit hospitals are more involved in the so-called up-coding than non-profit hospitals. Up-coding means that a patient whose diagnosis is associated with a certain case is shifted to another similar case that is more profitable.

Nursing homes set fees for their services that clients have to pay. A fixed lump sum for insured people is taken over by the German Compulsory Long-Term Care Insurance if the respective nursing home is officially licensed. The proportion of the fees that is not covered by the insurance, has to be borne by the client, her family, or social welfare if the client or her family is not able to pay. Nursing homes are free to set their own prices. Several studies find that non-profit nursing homes provide better quality of care than their for-profit counterparts, e.g., Clarfield et al. (2009), suggesting that non-profit nursing homes focus more on clients' needs because their profit motives seem to be weaker.

3.3 Hypotheses

3.3.1 Comparison of Non-Profit Firms with Different Sponsors

First, I derive hypotheses that relate to non-profit firms only. I compare non-profit firms that have foundations as sponsors to non-profit firms with other sponsors in order to find out whether foundation sponsorship makes a difference. For both types of non-profit firms the non-distribution constraint is binding. Sponsors have an interest that non-profit firms earn profits such that a financial buffer can be built up in order to fulfill the firm's purpose in the long-run, even in periods of economic downturn. Sponsors have a monitoring function and are exposed to reputational risk. I conjecture that, from a legal and an economic perspective, representatives of sponsors should act very similarly, regardless of the type of sponsor. As an example, it should not matter whether the sponsor is a foundation set up by a church or the church itself. I hypothesize that firm policies and financial performance of non-profit firms, whether foundation owned or not, are not significantly different:

Hypothesis A: Non-profit firms owned by foundations do not differ in (A.1) leverage, (A.2) labor intensity, and (A.3) financial performance, measured by return on assets, and the standard deviation of return on assets from non-profit firms with other sponsors.

3.3.2 Comparison of Non-Profit Firms and For-Profit Foundation Owned Firms

Given Hypothesis A, I next compare for-profit foundation owned firms to non-profit firms. Thus, in the remainder of this section, I do not discriminate between non-profit foundation owned firms and non-profit firms with other sponsors, but treat them as one group - non-profit firms. I derive hypotheses relating to differences in firm policies and financial performance between non-profit firms and for-profit foundation owned firms.

In contrast to for-profit firms, there is - by definition - no residual claimant in non-profit firms who may exercise control over the firm. This implies a strong form of separation of ownership and control. Also, other governance mechanisms such as capital market control and performance based pay are likely missing (Thomsen (2014))[7]. This might reinforce agency problems (Fama and Jensen (1983)). Due to the lack of several governance mechanisms, stakeholders, apart from the sponsors, might exploit the firm at the cost of financial performance and, thus, endanger the long-term survival of the firm and thereby its public benefit. This could happen by, e.g., excessive compensation of managers and directors, inappropriate salaries for the labor force, abuse of financial resources by managers and directors due to weak monitoring.

I focus on non-profit firms that produce goods and services and charge prices for them, "operating" non-profit firms (Hansmann (1980)), e.g., hospitals, nursing homes, colleges, i.e., firms that operate in industries where there is competition, also competition between firms that are for-profit and those that are non-profit. Competition might offset the aforementioned problems to some extent. Employees have a strong interest in being employed for the long-run. This requires that

[7] An exception are chief physicians who may get performance based pay.

the respective firm is a successful competitor being able to survive on the market. Hence, employees are incentivized to offer goods with high quality. Also, regulation might restrict agency problems. Regulatory agencies might have an interest in assuring the compliance with the firm charter. Thus, competition, regulation, and the influence of sponsors might mitigate agency conflicts to some extent.

In for-profit foundation owned firms, the beneficiaries are defined by the foundation charter. Their influence on the management is usually very restricted. On the other hand, representatives of a foundation have incentives to push the management for profits since the foundation's financing and therefore its existence crucially depend on profit payments of "their" firm. Otherwise, in an extreme scenario, a foundation would have to close down which might lead to the foundation's employees getting sacked and the foundation's purpose not to be fulfilled. Thus, the separation of ownership and control might lead to agency conflicts which are weaker than in non-profit firms.

While foundations' representatives may put more pressure on firms to earn money, sponsors of a non-profit firm may be more afraid of the risk that they have to inject additional equity into the firm or incur a reputational loss when the firm's purpose is not met. Thus, they have no (personal) profit incentive, but they are interested in a stable and safe development of the firm; in particular, they may push the management for a comfortable equity buffer. This motivates

Hypothesis B.1: For-profit foundation owned firms have a higher leverage than non-profit firms.

If there is only little performance pressure in non-profit firms, it is likely that stakeholders, apart from the sponsors, benefit from this situation at the cost of lower profits. The management faces, in particular, employees on a daily basis. Being successful as a management board crucially depends on the acceptance by the labor force. Thus, the management might have incentives to be generous to the employees. It can do so by, e.g., paying higher wages, making jobs safer, or creating new jobs in order to take some load off the existing labor force - thus, labor intensity is likely to rise. This motivates

Hypothesis B.2: Labor intensity is higher in non-profit firms than in for-profit foundation owned firms.

Since managers of non-profit firms are usually less rewarded for making profits and sponsors of non-profit firms are likely more afraid of reputational loss than owners of for-profit firms, there may be less risk taking in non-profit firms, also restricting profitable investment opportunities. Less risk taking and higher influence of the employees demanding a higher share of the firms' operating revenue is likely to lower financial performance of non-profit firms, measured by return on assets. On the other hand, less risk taking is expected to stabilize the return of a firm. In contrast, representatives of the foundation of a for-profit foundation owned firm have incentives to push the management for profits to be able to run the foundation. Therefore, some reasonable level of risk might be taken in order to achieve higher profits. This motivates

Hypothesis B.3: Financial performance, measured by return on assets, is lower in non-profit firms than in for-profit foundation owned firms. The standard deviation of return on assets is also lower in non-profit firms.

3.4 Data and Summary Statistics

3.4.1 Data Description

I analyze accounting and ownership data of German non-profit firms and of German for-profit foundation owned firms. The data of annual statements is taken from Orbis. Ownership data is from Orbis and Hoppenstedt and hand collected: if Orbis and Hoppenstedt provide deviating or no data for a firm, I check the firm's annual reports for ownership data and use these data. A not publicly available list of German (for-profit and non-profit) foundation owned firms from 2012 by Marc Eulerich from the University of Duisburg/Essen serves as the starting point for the sample selection. It is an updated version of the list in Fleschutz (2007). The new list comprises 740 firms. I start by selecting non-profit foundation owned firms. I apply several data filters. A firm is only included if a foundation has voting rights of at least 5 percent. For some firms, in particular small ones, Orbis provides only few data, not enough for a solid analysis. I exclude these firms. Also, I exclude firms that do not generate operating revenues. That leaves me with 46 non-profit foundation owned firms.

Non-profit foundation owned firms are compared to non-profit firms that are not foundation owned. This control group consists of firms matched by industry and size measured by the operating revenue. For industry classification, I use two digit US SIC codes; whenever there are more than 100,000 firms in a two digit US SIC industry, I switch to three digit US SIC industries. For each non-profit foundation owned firm, I collect up to five non-profit matching firms in the same industry that are closest in size. I end up with 200 matching firms, i.e., on average 4.3 matching firms. This should mitigate effects of idiosyncracies of single matching firms[8].

To compare non-profit foundation owned firms to for-profit foundation owned firms, from the sample of 164 for-profit foundation owned firms that Draheim and Franke (2015) analyze I select those 16 firms that operate in the same industries as the 46 non-profit foundation owned firms described before. For the sake of comparison, it is important to match on industry since all industries have peculiarities, such as specific production processes, financing policies, and customer bases. Ideally, that selection would lead to a large sample, but I end up with 16 for-profit foundation owned firms only.

In order to avoid outliers due to a structural break (e.g., a merger or a spin-off) or data errors, I analyze the time series of operating revenues, total assets, and number of employees. If I see a negative change of more than 50 percent or a positive change of more than 100 percent, I exclude all the firm's observations (for each variable I collect) before the change (see, e.g., Strebulaev and Yang (2013)). All the firms in my sample report the annual statements in accordance to German accounting standards. For each firm and each variable, all observations are deflated to the price level of 2005 using the Eurostat GDP deflator for Germany. Additionally, I account for extreme outliers by winsorizing each variable at the 1 percent- and the 99 percent-quantile.

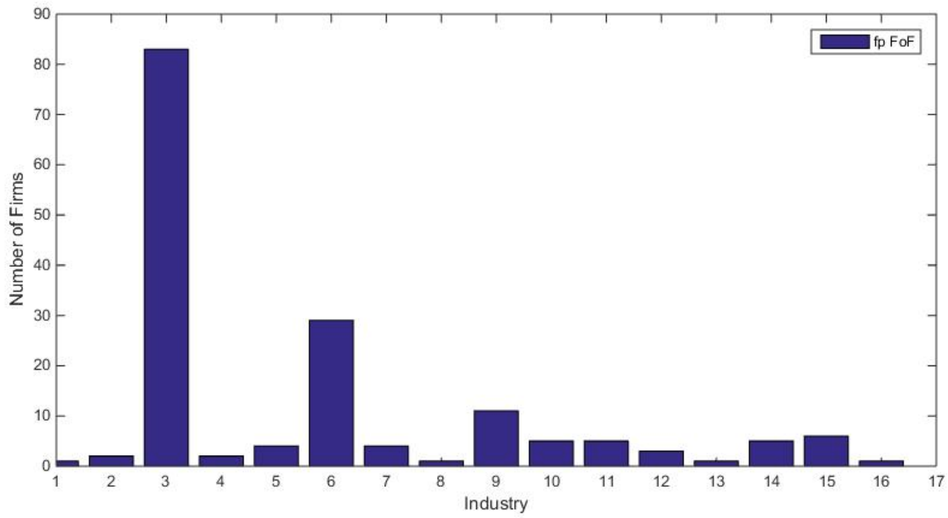
[8]Gao et al. (2013) match with respect to industry and size. He and Tian (2013) use a one-to-five-matching.

3.4.2 Summary Statistics

3.4.2.1 Industry Distribution

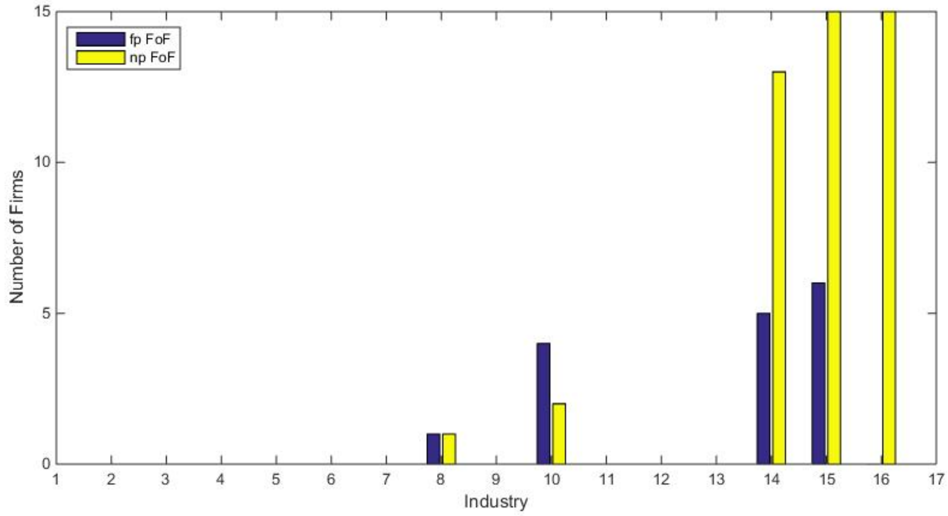
Figure 3.1 and Figure 3.2 display the distribution of firms across industries (listed in Table 3.1) for several settings. Figure 3.1 shows the industry distribution of the 164 for-profit foundation owned firms, analyzed by Draheim and Franke (2015), with a concentration on manufacturing, trade, and information and communication. Figure 3.2 displays the industry distribution of the 46 non-profit foundation owned firms (np FoF) and the 16 for-profit foundation owned firms that operate in the same industries as the 46 non-profit foundation owned firms I analyze (fp FoF). For non-profit foundation owned firms, there is a concentration on a few industries: accommodation and food service activities, real estate, education, hospitals, and nursing homes. The latter three industries have the highest shares. None of the for-profit foundation owned firms is active in the nursing homes industry. Overall, for non-profit firms, there is a strong focus on labor-intensive industries that offer complex personal services as suggested by Hansmann (1980), while for-profit foundation owned firms are more involved in industries where standardized goods are produced whose quality can be checked more easily.

Figure 3.1: Industry Distribution - For-Profit Foundation Owned Firms



This figure shows the industry distribution of the 164 for-profit foundation owned firms that Draheim and Franke (2015) analyze (fp FoF). Table 3.1 describes the industries.

Figure 3.2: Industry Distribution - For-Profit Foundation Owned Firms and Non-Profit Firms



This figure shows the industry distribution of 46 non-profit foundation owned firms firms (np FoF) and of 16 for-profit foundation owned firms (fp FoF). The 16 for-profit foundation owned firms are a subset of the 164 for-profit foundation owned firms that Draheim and Franke (2015) analyze. They are active in the same industries as the 46 non-profit foundation owned firms. Table 3.1 describes the industries.

Table 3.1: Industry Description

Industry	Description
1	Agriculture, Forestry, and Fishing
2	Mining and Quarrying
3	Manufacturing
4	Electricity, Gas, Steam, and Air Conditioning Supply
5	Construction
6	Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles
7	Transportation and Storage
8	Accommodation and Food Service Activities
9	Information and Communication
10	Real Estate Activities
11	Professional, Scientific, and Technical Activities
12	Administrative and Support Service Activities
13	Public Administration and Defense; Compulsory Social Security
14	Education
15	Hospitals
16	Nursing Homes
17	Arts, Entertainment, and Recreation

This table describes the industries this study takes into account.

3.4.2.2 Data Overview

Table 3.2 shows total assets, operating revenue, and the number of employees for the mean and several quantiles. The numbers are similar in non-profit firms that are foundation owned (np FoF) and non-profit firms owned by other sponsors (np Mat): while most numbers are higher for non-profit foundation owned firms (np FoF), there are also numbers that are higher for other non-profit firms (np Mat), e.g., the median of total assets and the number of employees. For the operating revenue, all the numbers are higher for non-profit foundation owned firms. For none of the variables, there is a significant difference in medians. Therefore, I conclude that there is no size differential within the group of non-profit firms.

For-profit foundation owned firms (fp FoF) appear to be smaller than non-profit firms with respect to the observed size measures. For-profit firms might be more specialized than non-profit firms. These might offer a broader range of services, regardless of profitability. But median tests do not support significant differences.

Voting shares of the foundations of for-profit and non-profit foundation owned firms are very similar in my sample. For both groups, they are rather high. Additionally, I present figures about the sponsors of non-profit firms that are not foundation owned. For 68 of 200 non-profit firms, a church or a church-related association is the sponsor. In 64 cases a local public authority, and in 59 cases a charitable association sponsors the firm. Nine firms have other sponsors.

Table 3.2: Summary Statistics

	N	Mean	Median	q25	q75
Average total assets (mill EUR)					
np FoF	46	112	20	11	110
np Mat	200	67	25	7	77
fp FoF	16	33	11	8	52
Average operating revenue (mill EUR)					
np FoF	43	78	28	11	97
np Mat	196	61	23	10	65
fp FoF	13	33	10	4	23
Average number of employees					
np FoF	46	950	347	169	1160
np Mat	192	810	373	157	1000
fp FoF	16	488	180	21	913
FoF-vote					
np FoF	46	0.81	1.00	0.61	1.00
fp FoF	16	0.79	1.00	0.60	1.00
Sponsors of np Mat					
Charitable Associations	59				
Churches	68				
Local Public Authorities	64				
Others	9				

This table shows summary statistics for non-profit foundation owned firms (np FoF), non-profit matching firms (np Mat), and for-profit foundation owned firms (fp FoF). In the upper part of the table, summary statistics for average total assets, average operating revenue, and average number of employees are presented. For each firm, an average number is a simple average of its numbers within the sampling period. In the lower part of the table, summary statistics for the vote share of foundations in foundation owned firms (FoF-vote) are displayed. The distribution of the non-profit matching firms across their sponsors is shown at the bottom. N refers to the number of observations, q25 to the 25%-quantile, and q75 to the 75%-quantile.

3.5 Results for the Comparison of Non-Profit Firms with Different Sponsors

3.5.1 Descriptive Statistics

3.5.1.1 Definitions

Table 3.3 shows several accounting numbers and ratios concerning the financing policy (Section 3.5.1.2 and Section 3.6.1.2), labor policy (Section 3.5.1.3 and Section 3.6.1.3), and financial performance (Section 3.5.1.4 and Section 3.6.1.4) of the firms in my sample. They are derived from the time series of accounting numbers for each firm. Then, I average the accounting numbers and ratios over time. Thereafter, I derive the median of each average number or ratio for non-profit foundation owned firms (np FoF), other non-profit firms (np Mat), and for-profit foundation owned firms (fp FoF). For the latter two subsamples, I display the ratios of the median of non-profit foundation owned firms divided by the median of other non-profit firms (np FoF/np Mat), and the median of all non-profit firms divided by the median of for-profit foundation owned firms (np / fp FoF, Section 3.6.1). I also display p-values to check for the significance of differences in medians.

Table 3.3: Descriptive Statistics

		np FoF	np FoF / np Mat	np / fp FoF
Financing Policy				
Shareholder funds/total assets		0.567	0.93	1.67**
			(0.414)	(0.020)
	N	46	200	16
Labor Policy				
Average income		38644	1.10	1.03
			(0.237)	(0.795)
	N	46	189	14
Personnel expense/operating revenue		0.581	1.00	1.15
			(0.976)	(0.143)
	N	43	194	12
Personnel expense/material expense		4.966	0.77	1.08
			(0.108)	(0.989)
	N	38	180	9
Financial Performance				
RoA		0.019	0.86	0.34**
			(0.870)	(0.032)
	N	46	198	15
sd_RoA		0.018	1.13	0.59***
			(0.845)	(0.008)
	N	46	191	15
RoE		0.025	0.89	0.19**
			(0.870)	(0.032)
	N	46	198	15
sd_RoE		0.029	0.88	0.39***
			(0.645)	(0.001)
	N	46	191	15

This table shows descriptive statistics for various accounting numbers. Average income is defined as personnel expense/number of employees. sd_RoA is the standard deviation of a firm's RoA (= EBIT/total assets) over the sampling period. sd_RoE is the standard deviation of a firm's RoE (= EBT/shareholder funds) over the sampling period. The first column displays medians of firms' average accounting numbers for non-profit foundation owned firms (np FoF). In the second column, the ratio of medians of non-profit foundation owned firms' and non-profit matching firms' average accounting numbers are shown (np FoF / np Mat). In the third column, the ratio of medians of non-profit firms' and for-profit foundation owned firms' average accounting numbers are shown (np / fp FoF). N refers to the number of observations: for "np FoF", it is the number of non-profit foundation owned firms, for "np FoF / np Mat", it is the number of non-profit matching firms, for " np / fp FoF", it is the number of for-profit foundation owned firms. p-values indicating whether the difference in medians is significant, are shown in parentheses. ⋆, ⋆⋆, ⋆ ⋆ ⋆ indicate statistical significance at the 10%, 5%, and 1% level, respectively.

3.5.1.2 Financing Policy

For the ratio "shareholder funds/total assets" there is no significant difference ($p = 0.414$) between non-profit firms that are foundation owned and those that are not, indicating no significantly different leverage levels in both groups and therefore supporting Hypothesis A.1.

3.5.1.3 Labor Policy

The ratio "personnel expense/number of employees" reflects the average income of an employee. Although it seems to be higher in non-profit foundation owned firms than in other non-profit firms, the difference is not statistically significant ($p = 0.237$) which suggests a similar compensation policy. The difference in the ratio "personnel expense/operating revenue" is insignificant ($p = 0.976$) when comparing both groups of non-profit firms indicating a similar share of expenditures for the staff, relative to the firms' turnover. "Personnel expense/material expense" reflects the substitution of raw material by labor and could be interpreted as a measure for less outsourcing or more vertical integration. Its difference between non-profit foundation owned firms and other non-profit firms is not significantly different ($p = 0.108$). Thus, these findings are consistent with Hypothesis A.2 which states that non-profit foundation owned firms do not differ from other non-profit firms in terms of labor intensity.

3.5.1.4 Financial Performance

Comparing the financial performance of non-profit foundation owned firms and other non-profit firms, we do not find a significant difference for the return on assets (RoA = EBIT/total assets, $p = 0.870$) and the return on equity (RoE = EBT/shareholder funds, $p = 0.870$). That supports Hypothesis A.3. The standard deviations of the firms' RoA and RoE are not significantly different ($p = 0.845$ and $p = 0.645$) suggesting that the financial performance of non-profit firms that are foundation owned and of those with other sponsors is exposed to similar volatility, in line with Hypothesis A.3. These findings indicate that non-profit firms have about the same returns and stability of returns, irrespective of the type of sponsorship.

3.5.2 Regression Analysis

3.5.2.1 Production Policy

To further analyze labor intensity of firms, I estimate the production function of firms and check whether the elasticities for labor expense and the elasticities for material expense differ for certain groups of firms. For the production technology, I assume a Cobb-Douglas function

$$log(OR) = a\ log(PE) + b\ log(ME) + c\ log(DE), \tag{3.1}$$

where OR denotes operating revenue, PE personnel expense, ME material expense, and DE depreciation. The sum of the elasticities of the input factors a, b, and c should be close to one since those input factors are the most important ones in the production process of a firm. I estimate the elasticities by a panel regression with firm fixed effects, i.e.,

$$log(OR_{i,t}) = v_i + a\ log(PE_{i,t}) + b\ log(ME_{i,t}) + c\ log(DE_{i,t}) + \varepsilon_{i,t}, \tag{3.2}$$

where v_i is the firm fixed effect for firm i, t denotes the time index, and $\varepsilon_{i,t}$ is the error term. Industry fixed effects are captured by firm fixed effects. In order to find out whether elasticities of non-profit foundation owned firms are different from elasticities of other non-profit firms, I add interaction terms for non-profit foundation owned firms. These interaction terms are constructed by multiplying the FoF dummy (1, if firm is foundation owned; 0, if not) with a variable. The results are shown in Table 3.4.1.

Table 3.4: Cobb-Douglas Function

3.4.1 log(OR)	coefficient	3.4.2 log(OR)	coefficient
log(PE)	0.717***	log(PE)	0.505***
	(0.000)		(0.000)
FoF×log(PE)	−0.000	NPF×log(PE)	0.208***
	(0.998)		(0.000)
log(ME)	0.410*	log(ME)	0.205***
	(0.013)		(0.001)
FoF×log(ME)	0.003	NPF×log(ME)	−0.164***
	(0.962)		(0.008)
log(DE)	0.060***	log(DE)	0.017
	(0.003)		(0.772)
FoF×log(DE)	−0.033	NPF×log(DE)	0.037
	(0.289)		(0.544)
Firm fixed effects	yes	Firm fixed effects	yes
within R^2	0.7298	within R^2	0.7110
N	1429	N	1475

This table shows the results of panel regressions estimating the Cobb-Douglas function $log(OR_{i,t}) = v_i + a\ log(PE_{i,t}) + b\ log(ME_{i,t}) + c\ log(DE_{i,t}) + \varepsilon_{i,t}$. PE is personnel expense, ME material expense, and DE depreciation. v_i is the fixed effect for firm i, and $\varepsilon_{i,t}$ is the error term. Table 3.4.1 shows the regression results for non-profit firms. Interaction terms for non-profit foundation owned firms are included to check for different elasticities. They are constructed by multiplying the FoF dummy (1, if firm is foundation owned; 0, if not) with a variable. Table 3.4.2 shows the regression results for non-profit firms and for-profit foundation owned firms. Interaction terms for non-profit firms are included to check for different elasticities. They are constructed by multiplying the NPF dummy (1, if firm is non-profit; 0, if not) with a variable. Year dummies and regression constants are included, but not shown. N refers to the number of observations. p-values in parentheses indicate whether a coefficient is significant and are based on standard errors adjusted for clustering (firm) effects and heteroscedasticity. $\star$, $\star\star$, $\star\star\star$ indicate statistical significance at the 10%, 5%, and 1% level, respectively.

The interaction terms for non-profit foundation owned firms are insignificant ($p = 0.998$ for personnel expense, $p = 0.962$ for material expense, and $p = 0.289$ for depreciation) indicating that the production process does not differ. Regarding the other estimates, the elasticity of operating revenue with respect to personnel expense is significant ($p = 0.000$) and higher than the other elasticities. The sum of the significant elasticities is 0.76. This finding indicates that non-profit firms produce goods and services using high input of labor. The analysis indicates that non-profit firms do not differ, regardless of being owned by a foundation or by another sponsor, in terms of labor intensity, in line with Hypothesis A.2.

3.5.2.2 Employment Policy

One channel to benefit employees is to provide them job security. An employee-friendly management that is exposed to less performance pressure might be more willing to keep the number of employees stable, even in periods of economic downturn. In addition, it will aim to have a rather high employment level to take off some pressure of the existing workforce. That might be associated to higher levels of labor intensity. Here, I investigate whether there are differences in how firms react to good or bad market situations in terms of their employment policy. More precisely, I want to analyze if firms hire more people in good times and/or lay off more employees in bad times. I investigate if changes in operating revenue have an impact on (i) changes in personnel expense which might be an indicator for the hiring of new people (positive change) or the layoff of employees (negative change), and (ii) changes in the number of employees directly. Here, I check whether there are differences within the group of non-profit firms.

For the first analysis, I estimate the panel regression

$$PE_{i,t}/PE_{i,t-1} = a + b\, OR^{+}_{i,t} + c\, OR^{-}_{i,t} + v_i + \varepsilon_{i,t}, \qquad (3.3)$$

where $PE_{i,t}$ is personnel expense of firm i in year t, v_i is the firm fixed effect of firm i, $\varepsilon_{i,t}$ is the error term, and $OR^{+}_{i,t} := max(OR_{i,t}/OR_{i,t-1} - 1, 0)$ and $OR^{-}_{i,t} := min(OR_{i,t}/OR_{i,t-1} - 1, 0)$ which represents the positive ($OR^{+}_{i,t}$) or negative ($OR^{-}_{i,t}$) relative change of operating revenue. As further specification, I replace personnel expense (PE) by the number of employees (EMP). In addition, I analyze whether operating revenue changes of at least 10 percent have an impact on personnel expense and the number of employees. I do this by using $OR^{++}_{i,t} := max(OR_{i,t}/OR_{i,t-1} - 1.1, 0)$ instead of $OR^{+}_{i,t}$, and $OR^{--}_{i,t} := min(OR_{i,t}/OR_{i,t-1} - 0.9, 0)$ instead of $OR^{-}_{i,t}$, respectively. Differences between non-profit foundation owned firms and non-profit firms with other sponsors are analyzed using interaction terms; interaction terms for non-profit foundation owned firms are constructed by multiplying the FoF dummy with a variable.

Table 3.5 displays the results. For personnel expense the findings are shown on the left hand side, for the number of employees the findings are shown on the right hand side. The lower part of the table shows the findings when the changes in operating revenue are at least 10 percent. For all specifications, I find that interaction terms are insignificant indicating that non-profit foundation owned firms do not differ from other non-profit firms in terms of their employment policy. If I analyze relative changes of personnel expense and the number of employees, significant coefficients for positive and negative changes in operating revenue are similar, indicating no varying employment policy due to positive or negative economic changes. Significance tests for the differences support this. If I move to analyzing the impact of changes in operating revenue of at least 10 percent, coefficients of negative operating revenue changes get higher than those of positive operating revenue changes but the differences remain insignificant. Thus, for non-profit firms I do not find significantly different reactions concerning employment in good or bad economic periods. In particular, I do not find significant differences between non-profit firms that are foundation owned and those with other sponsors. This might support Hypothesis A.2.

Table 3.5: Employment Policy of Non-Profit Firms

PE_t/PE_{t-1}	coefficient	difference	EMP_t/EMP_{t-1}	coefficient	difference
OR_t^+	0.705***		OR_t^+	0.677***	
	(0.000)			(0.000)	
OR_t^-	0.707***	−0.002	OR_t^-	0.714***	−0.037
	(0.000)			(0.000)	
FoF×OR_t^+	−0.050		FoF×OR_t^+	0.167	
	(0.652)			(0.307)	
FoF×OR_t^-	0.075	0.025	FoF×OR_t^-	0.031	0.136
	(0.745)			(0.936)	
Firm fixed effects	yes		Firm fixed effects	yes	
within R^2	0.6702		within R^2	0.3904	
N	1099		N	902	
PE_t/PE_{t-1}	coefficient	difference	EMP_t/EMP_{t-1}	coefficient	difference
OR_t^{++}	0.871***		OR_t^{++}	0.882***	
	(0.000)			(0.000)	
OR_t^{--}	1.021***	−0.150	OR_t^{--}	1.041***	−0.159
	(0.000)			(0.000)	
FoF×OR_t^{++}	−0.131		FoF×OR_t^{++}	0.114	
	(0.415)			(0.609)	
FoF×OR_t^{--}	0.183	−0.314	FoF×OR_t^{--}	0.120	−0.006
	(0.627)			(0.815)	
Firm Firm fixed effects	yes		Firm fixed effects	yes	
within R^2	0.6007		within R^2	0.3603	
N	1099		N	902	

This table shows the results of panel regressions with firm fixed effects estimating the employment policy for non-profit firms. Interaction terms for non-profit foundation owned firms are included to check for different elasticities. They are constructed by multiplying the FoF dummy (1, if firm is foundation owned; 0, if not) with a variable. On the left hand side, PE_t/PE_{t-1} is the dependent variable, on the right hand side, it is EMP_t/EMP_{t-1}. PE is personnel expense, EMP is the number of employees. The upper part of the table refers to positive and negative changes of operating revenue (OR_t^+ and OR_t^-). The lower part of the table refers to positive and negative changes of operating revenue of at least 10 percent (OR_t^{++} and OR_t^{--}). Year dummies and regression constants are included, but not shown. "difference" is the difference between the two coefficients next to the number, with asterisks indicating significance. N refers to the number of observations.

p-values in parentheses indicate whether a coefficient is significant and are based on standard errors adjusted for clustering (firm) effects and heteroscedasticity. $\star$, $\star\star$, $\star\star\star$ indicate statistical significance at the 10%, 5%, and 1% level, respectively.

3.5.2.3 Analysis of RoA

In this section, I take a deeper look at the financial performance of non-profit firms. In particular, I am interested whether regression analysis can support the findings from descriptive statistics that there is no difference in RoA within the group of non-profit firms. Therefore, I first panel-regress RoA on some time-varying explanatory variables that may have an impact (Table 3.6.1). In this panel regression, I include firm fixed effects. In a second step, I OLS-regress the estimated firm fixed effects on time-invariant regressors (Table 3.7.1). In particular, I include the FoF dummy in order to check for return differences of non-profit foundation owned firms, relative to non-profit firms with other sponsors. The results are shown in Table 3.6.1 and Table 3.7.1.

Table 3.6: RoA-Analysis - First Step

3.6.1		3.6.2	
RoA	coefficient	RoA	coefficient
log(OR)	0.067	log(OR)	0.063
	(0.133)		(0.151)
OR growth rate	0.024	OR growth rate	0.024
	(0.448)		(0.439)
leverage	−0.008	leverage	−0.004
	(0.921)		(0.955)
leverage squared	−0.053	leverage squared	−0.056
	(0.529)		(0.497)
Firm fixed effects	yes	Firm fixed effects	yes
within R^2	0.0645	within R^2	0.0620
N	1368	N	1416

This table shows the findings of panel regressions estimating return on assets on log(OR), the growth rate of OR ($\log(\text{OR}_t/\text{OR}_{t-1})$), leverage (= (total assets - shareholder funds)/total assets), and leverage squared as explanatory variables. OR is operating revenue. In this panel regression, I include firm fixed effects. Table 3.6.1 shows the regression results for non-profit firms. Table 3.6.2 shows the regression results for non-profit firms and for-profit foundation owned firms. Year dummies and regression constants are included, but not shown. N refers to the number of observations. p-values in parentheses indicate whether a coefficient is significant and are based on standard errors adjusted for clustering (firm) effects and heteroscedasticity. $\star$, $\star\star$, $\star\star\star$ indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Table 3.7: RoA-Analysis - Second Step

3.7.1 Firm fixed effects	coefficient	coefficient	3.7.2 Firm fixed effects	coefficient	coefficient
FoF	−0.019	-	NPF	−0.095***	−0.110***
	(0.233)			(0.000)	(0.000)
sp_char_assoc	-	0.052***	NPF×sp_char_assoc	-	0.048***
		(0.001)			(0.002)
sp_church	-	0.005	NPF×sp_church	-	0.005
		(0.691)			(0.677)
sp_loc_auth	-	0.002	NPF×sp_loc_auth	-	0.001
		(0.903)			(0.911)
sp_others	-	0.053	NPF×sp_others	-	0.053
		(0.185)			(0.189)
codet	−0.131***	−0.123***	codet	−0.127***	−0.120***
	(0.000)	(0.000)		(0.000)	(0.000)
FoF×codet	−0.001	-	FoF×codet	-	-
	(0.973)				
sd_RoA	0.709***	0.629***	sd_RoA	0.765***	0.669***
	(0.001)	(0.001)		(0.000)	(0.000)
Industry dummies	yes	yes	Industry dummies	yes	yes
adj. R^2	0.5564	0.5910	adj. R^2	0.5615	0.5909
N	224	224	N	237	237

This table shows the findings of OLS-regressions of firm fixed effects estimated in the regressions of Table 3.6. In Table 3.7.1, I analyze firm fixed effects derived for all non-profit firms. FoF is a dummy which is 1 for an FoF and 0 otherwise. In Table 3.7.2, I analyze firm fixed effects derived for non-profit firms and for-profit foundation owned firms. NPF is a dummy which is 1 for a non-profit firm and 0 otherwise. sp_char_assoc, sp_church, sp_loc_auth, and sp_others are dummies that are 1 if the sponsor of a non-profit firm is a charitable association, a church, a local public authority, or another sponsor, respectively, and 0 otherwise. Interaction dummies are constructed by multiplying the NPF dummy with dummies for the sponsor types. codet is a dummy which is 1 for a corporation with a supervisory board in which at least 1/3 of the seats are assigned to employee representatives. FoF×codet is an interaction dummy multiplying the FoF dummy with the codetermination dummy. sd_RoA is the standard deviation of the return on assets time series of a firm. Industry dummies and regression constants are included, but not shown. N refers to the number of observations. p-values in parentheses indicate whether a coefficient is significant and are based on standard errors correcting for heteroscedasticity. $\star$, $\star\star$, $\star\star\star$ indicate statistical significance at the 10%, 5%, and 1% level, respectively.

In Table 3.6.1, I display the first step regression results for non-profit firms. I use log(OR), the growth rate of OR ($\log(\text{OR}_t/\text{OR}_{t-1})$), leverage ((total assets - shareholder funds)/total assets), and leverage squared as explanatory variables. Since interaction terms never turn out to be significant, I use unique slopes for non-profit foundation owned firms and other non-profit firms. None of the coefficients turns out to be significant. That is why I draw my attention to the analysis of the estimated fixed effects.

I analyze the estimated firm fixed effects in Table 3.7.1. In the first regression, I find that the FoF dummy is insignificant ($p = 0.233$) indicating that there are no differences in financial performance of non-profit foundation owned firms and non-profit firms with other sponsors. This finding is consistent with descriptive statistics and supports Hypothesis A.3. In the second regression, I analyze the effects of different sponsors of non-profit firms by including dummies for charitable associations (sp_char_assoc), churches (sp_church), local public authorities (sp_loc_auth), and other sponsors (sp_others), thus, sponsoring foundations are the reference group. Only the dummy for charitable associations turns out to be significant ($p = 0.001$). It is positive indicating higher performance of non-profit firms owned by charitable associations. Possibly, churches and local public authorities put less pressure on the management than other sponsors. The profit motive of churches and local public authorities appears to be weaker which is not surprising since their objectives are usually not monetary[9].

In addition, I control for codetermination. According to German law, there are representatives of employees on a firm's supervisory board if the number of employees exceeds 500. In all OLS-regressions, the codetermination dummy codet is 1 if this requirement is fulfilled and 0 otherwise. Since interaction terms with codet always turn out to be insignificant, I just include the interaction term in the first regression in order to visualize this finding. The coefficient of codet is always highly significant and negative. Obviously, codetermination lowers RoA. Additionally, I include the standard deviation of the time series of RoA (sd_RoA) as regressor.

[9] There is also some evidence that salaries are lower if a church is the sponsor due to different labor agreements. That might lead to lower incentives.

It is always highly significant and positive. Apparently, higher risk due to higher return volatility induces higher returns.

In addition to comparing the return on assets and its standard deviation for non-profit firms with foundations as sponsors and those with other sponsors, I estimate a measure for risk-adjusted financial performance, the so-called Sharpe ratio. It is defined as the average over yearly excess returns (RoA at a year minus the corresponding one-year money market rate) divided by sd_RoA. A median comparison does not show significant differences for non-profit foundation owned firms and other non-profit firms. OLS-regressing the Sharpe ratio on the FoF dummy and average operating revenue, codetermination, and industry dummies as control variables, does not lead to a significant coefficient of the FoF dummy indicating no significant differences in the Sharpe ratio between non-profit foundation owned firms and other non-profit firms.

3.6 Results for the Comparison of Non-Profit Firms and For-Profit Foundation Owned Firms

3.6.1 Descriptive Statistics

3.6.1.1 Approach

The findings of the last sections support the hypothesis that non-profit firms do not differ concerning financing policy, labor intensity, and financial performance, regardless of being foundation owned or not (Hypothesis A). Therefore, I treat all non-profit firms as one group and now compare all non-profit firms (np) to for-profit foundation owned firms (fp FoF). The results of descriptive statistics are shown in Table 3.3 (np / fp FoF).

3.6.1.2 Financing Policy

The ratio "shareholder funds/total assets" is significantly lower ($p = 0.020$) for for-profit foundation owned firms, compared to non-profit firms indicating a higher leverage of the first group. This supports Hypothesis B.1.

3.6.1.3 Labor Policy

Average compensation, measured by "personnel expense/number of employees", is not significantly different ($p = 0.795$) between non-profit firms and for-profit foundation owned firms. For the ratio "personnel expense/operating revenue", there is no significant difference ($p = 0.143$). The measure for vertical integration, "personnel expense/material expense", is also not significantly different ($p = 0.989$) for non-profit firms and for-profit foundation owned firms. Thus, these findings do not support Hypothesis B.2 stating that non-profit firms are more labor-intensive than their for-profit counterparts.

3.6.1.4 Financial Performance

The return on assets (RoA) significantly differs ($p = 0.032$) for for-profit foundation owned firms and non-profit firms. It is significantly higher for for-profit foundation owned firms. For the return on equity (RoE), the finding is similar. It is significantly higher ($p = 0.032$) for for-profit foundation owned firms. The finding for RoE does not come as a surprise, since, in addition to lower earnings in non-profit firms as indicated by the RoA, their leverage is also lower as seen before, i.e., their shareholder funds are higher. Thus, these findings support a lower financial performance in non-profit firms (Hypothesis B.3). Since EBIT and EBT are pre-tax measures of earnings, I do not have to deal with a potential bias in financial performance arising from different taxation for non-profit and for-profit firms.

The standard deviations of the firms' RoA and RoE are significantly lower (p=0.008 and p=0.001) for non-profit firms, relative to for-profit foundation owned firms indicating more stability of financial performance of non-profit firms which supports Hypothesis B.3. Therefore, non-profit firms seem to be less risky than for-profit foundation owned firms.

Thus, for non-profit firms and for-profit foundation owned firms, I find the well documented positive relationship between return and risk which also holds for stock returns (see, e.g., Glosten et al. (1993), Duffee (1995), Bekaert and Wu (2000)). Apparently, more risk-taking in for-profit foundation owned firms leads to better financial performance.

3.6.2 Regression Analysis

3.6.2.1 Production Policy

Next, I analyze differences in the production policy between for-profit foundation owned firms and non-profit firms estimating the regression function (3.2). I take into account differences of the production policy of non-profit firms and for-profit foundation owned firms by using interaction terms for non-profit firms. These interaction terms are constructed by multiplying the NPF dummy (1, if firm is a non-profit firm; 0, if not) with a variable. Table 3.4.2 displays the results. The elasticities of operating revenue to depreciation are not significant. The other elasticities are significant (p=0.000 for personnel expense, and $p = 0.001$ for material expense), including the non-profit interaction terms ($p = 0.000$ for personnel expense, and $p = 0.008$ for material expense). The sum of the significant elasticities is 0.71 for for-profit foundation owned firms and 0.75 for non-profit firms. The highest elasticity is that of operating revenue with respect to personnel expense with 0.51. The interaction term of non-profit firms raises this elasticity by 0.21. For material expense the elasticity is 0.21, the interaction term of non-profit firms lowers this by 0.16. The significant interaction terms indicate that the production process differs for for-profit and non-profit firms. Non-profit firms seem to substitute labor for material, relative to for-profit foundation owned firms. This clearly suggests more labor intensity in non-profit firms and therefore supports Hypothesis B.2.

3.6.2.2 Employment Policy

Analogously to Section 3.5.2.2, I now analyze the employment policy for non-profit firms and for-profit foundation owned firms estimating regression function (3.3). In order to capture differences between both groups, I use interaction terms for non-profit terms (NPF dummy multiplied with a variable). I analyze the same specifications as in Section 3.5.2.2. Table 3.8 displays the results.

When I analyze the impact of changes in operating revenue on changes in personnel expense (left hand side of Table 3.8), I find that none of the non-profit interaction terms turns out significant indicating a similar employment policy in non-profit firms and for-profit foundation owned firms which might be a contradiction to Hypothesis B.2. The coefficient of a positive change of operating revenue (OR_t^+) is significant ($p = 0.019$) and positive. This suggests that some hiring takes place when operating revenue increases positively. For positive changes in operating revenue of more than 10 percent, the coefficient is slightly significant ($p = 0.086$) and positive.

Analyzing the impact of changes in operating revenue on changes in the number of employees (right hand side, upper part of Table 3.8), I find that there are substantial differences between non-profit firms and for-profit foundation owned firms. For negative changes, the non-profit interaction term is significant ($p = 0.000$) and negative offsetting the significant ($p = 0.000$) and positive coefficient of OR_t^- for for-profit foundation owned firms. In sum, for negative changes in operating revenue, the elasticity of non-profit firms amounts to 0.73 which is substantially lower than 1.84 for for-profit foundation owned firms. This finding suggests that non-profit firms might react more weakly to negative operating revenue changes in terms of layoffs.

When I consider changes in operating revenue of more than 10 percent and their impact on the number of employees (right hand side, lower part of Table 3.8), I find that non-profit interaction terms partly offset the (significant) effects of for-profit foundation owned firms. In total, for-profit foundation owned firms react to positive changes in operating revenue with hiring more people (coefficient of 1.93, $p = 0.000$). On the other hand, negative changes lead to the reduction of the workforce (coefficient of 3.23, $p = 0.000$). The latter effect is significantly stronger. Non-profit firms react more weakly to changes in operating revenue of more than 10 percent. This is suggested by (significantly) negative interaction terms ($p = 0.005$ for $\mathrm{NPF}\times\mathrm{OR}_t^{++}$, and $p = 0.000$ for $\mathrm{NPF}\times\mathrm{OR}_t^{--}$); also, the coefficient for negative changes is significantly higher in absolute terms. For non-profit firms, the coefficient of OR_t^{++} amounts to 0.92, and the coefficient of OR_t^{--} amounts to 1.09, i.e., the difference between the reaction to positive and negative changes in operating revenue is rather small. That indicates that, in terms of the number of employees, the employment policy is much more stable in non-profit firms. For-profit foundation owned firms turn out to react more strongly to negative changes than to positive changes in operating revenue. That might lead to less labor intensity in for-profit foundation owned firms and, thus, might support Hypothesis B.2.

Combining the findings for the impact of changes in operating revenue on personnel expense and the number of employees, the conclusion is not clear-cut. The findings for personnel expense might contradict Hypothesis B.2, whereas the findings for the number of employees might support Hypothesis B.2.

Table 3.8: Employment Policy of Non-Profit Firms and For-Profit Foundation Owned Firms

PE_t/PE_{t-1}	coefficient	difference	EMP_t/EMP_{t-1}	coefficient	difference
OR_t^+	0.514**		OR_t^+	1.087*	
	(0.019)			(0.084)	
OR_t^-	0.735	−0.221	OR_t^-	1.836***	−0.037
	(0.101)			(0.000)	
NPF×OR_t^+	0.181		NPF×OR_t^+	−0.369	
	(0.421)			(0.560)	
NPF×OR_t^-	−0.023	0.204	NPF×OR_t^-	−1.102***	0.733
	(0.960)			(0.000)	
Firm fixed effects	yes		Firm fixed effects	yes	
within R^2	0.6654		within R^2	0.4065	
N	1135		N	931	
PE_t/PE_{t-1}	coefficient	difference	EMP_t/EMP_{t-1}	coefficient	difference
OR_t^{++}	0.577*		OR_t^{++}	1.929***	
	(0.086)			(0.000)	
OR_t^{--}	0.921***	−0.150	OR_t^{--}	3.234***	−1.305***
	(0.237)			(0.000)	
NPF×OR_t^{++}	0.269		NPF×OR_t^{++}	−1.014***	
	(0.435)			(0.005)	
NPF×OR_t^{--}	0.183	0.147	NPF×OR_t^{--}	−2.147***	1.133**
	(0.627)			(0.000)	
Firm fixed effects	yes		Firm fixed effects	yes	
within R^2	0.5946		within R^2	0.3816	
N	1135		N	931	

This table shows the results of panel regressions with firm fixed effects estimating the employment policy for non-profit firms and for-profit foundation owned firms. Interaction terms for non-profit firms are included to check for different elasticities. They are constructed by multiplying the NPF dummy (1, if firm is non-profit; 0, if not) with a variable. On the left hand side, PE_t/PE_{t-1} is the dependent variable, on the right hand side, it is EMP_t/EMP_{t-1}. PE is personnel expense, EMP is the number of employees. The upper part of the table refers to positive and negative changes of operating revenue (OR_t^+ and OR_t^-). The lower part of the table refers to positive and negative changes of operating revenue of at least 10 percent (OR_t^{++} and OR_t^{--}). Year dummies and regression constants are included, but not shown. "difference" is the difference between the two coefficients next to the number, with asterisks indicating significance. N refers to the number of observations. p-values in parentheses indicate whether a coefficient is significant and are based on standard errors adjusted for clustering (firm) effects and heteroscedasticity. $\star$, $\star\star$, $\star\star\star$ indicate statistical significance at the 10%, 5%, and 1% level, respectively.

3.6.2.3 Analysis of RoA

In analogy to Section 3.5.2.3, I perform the RoA analysis for the comparison of non-profit firms and for-profit foundation owned firms. In the first step, the fixed effects panel regression of RoA on log(OR), the growth rate of OR, leverage, and leverage squared does not return significant coefficients (see Table 3.6.2). Interaction terms which I do not report, turn out to be insignificant. Anyway, I am more interested in the results of the second step OLS-regression where I regress the fixed effects, estimated in the first step, on several time-invariant variables as the NPF dummy, in particular (see Table 3.7.2). For both regressions, the NPF dummy is significantly negative ($p = 0.000$). This clearly supports Hypothesis B.3 stating that non-profit firms have an inferior financial performance, measured by return on assets, relative to for-profit foundation owned firms. The codetermination dummy codet is significantly negative ($p = 0.000$) in both regressions indicating inferior financial performance when there is codetermination. In line with the theory and many empirical studies, my findings show a significantly positive ($p = 0.000$ for both regressions) relationship between RoA and the standard deviation of RoA (sd_RoA). In the second regression, I include, in addition to the NPF dummy, interaction terms for the sponsors (NPF dummy multiplied with the sponsor type dummy). I, again, find that non-profit firms that have charitable associations as sponsors have a higher RoA. This finding might be due to more professional management boards due to a stronger profit motive in charitable associations, relative to other sponsors.

Analyzing the risk-adjusted financial performance, measured by the Sharpe ratio, I find that the Sharpe ratio of for-profit foundation owned firms is significantly higher, relative to non-profit firms. Comparing the medians of both groups, I find that the median is 1.48 for for-profit foundation owned firms and −0.06 for non-profit firms. The difference is significant ($p = 0.013$). OLS-regressing the Sharpe ratio on the NPF dummy and average operating revenue, the codetermination dummy, and industry dummies as control variables, I find that the coefficient of the NPF dummy is significantly negative ($p = 0.017$). This indicates a significantly inferior risk-adjusted financial performance of non-profit firms which is mainly driven by clearly lower return on assets in non-profit firms.

3.6.3 Report of Empirical Evidence for the Comparison of For-Profit Foundation Owned Firms and Other For-Profit Firms

Draheim and Franke (2015) compare firm policies and financial performance of for-profit foundation owned firms and other profit-oriented firms that are not foundation owned. They hypothesize that, due to the lack of natural persons as residual claimants, the profit motive of the management is weaker in foundation owned firms. This is conjectured to be beneficial for the employees who have a privileged position in foundation owned firms. They test this using a sample of 164 foundation owned firms that are spread across many industries and 757 firms matched with respect to industry and size.

They find that foundation owned firms operate at lower levels of leverage, i.e., their financing policy is more conservative which is in favor of a long-term orientation of a firm. This seems to be appreciated by the employees who seek for job security. In addition, they appear to be more labor-intensive, relative to matching firms - foundation owned firms seem to outsource less. The privileged position of employees comes at the cost of inferior financial performance - RoA is lower in foundation owned firms. On the other hand, the stability of RoA is higher in foundation owned firms, i.e., the standard deviation of RoA is lower. That results to Sharpe ratios that do not differ between foundation owned firms and matching firms.

Combining the findings of Draheim and Franke (2015) with the findings of this study, there is evidence that the intensity of the profit motive in a firm has an impact on firm policies and financial performance. Comparing for-profit foundation owned firms to other for-profit firms and for-profit foundation owned firms to non-profit firms yields the same results: a stronger profit motive seems to interact with a less conservative financing policy, less labor intensity, and superior financial performance measured by RoA, but the standard deviation of RoA seems to be higher. The results for the risk-adjusted financial performance, measured by the Sharpe ratio, are not clear-cut: for for-profit foundation owned firms and other for-profit firms Sharpe ratios do not differ, while they are significantly lower for non-profit firms, relative to for-profit foundation owned firms.

3.7 Conclusion

This study investigates how for-profit foundation owned firms and non-profit firms differ along firm policies and financial performance. It highlights three key findings: non-profit firms (1) operate with lower leverage ratios, (2) they operate more labor-intensively, and (3) their financial performance measured by return on assets is lower, but also subject to lower volatility. Also, risk-adjusted financial performance is lower for non-profit firms, relative to their for-profit counterparts. These findings may be due to the weaker profit motive in non-profit firms leading to two driving channels. First, managers of non-profit firms are less rewarded for potential excess profits resulting from risk taking. Second, representatives of sponsors usually face higher reputational costs if non-profit firms run into financial distress, relative to owners of for-profit firms. Non-profit foundation owned firms do not differ significantly in terms of leverage, labor intensity, and financial performance and its volatility from other non-profit firms.

Draheim and Franke (2015) compare for-profit foundation owned firms to other for-profit firms. They find that, due to the weakened profit motive, for-profit foundation owned firms have a lower leverage, appear to be more labor-intensive, and have a lower return on assets, as well as a lower volatility of return on assets, relative to other for-profit firms; the risk-adjusted financial performance does not differ. Combining the findings, for-profit foundation owned firms have a lower leverage, more labor intensity, and inferior financial performance, but less volatility of returns than other for-profit firms. On the other hand, their leverage is higher, their labor intensity is lower, and their financial performance and volatility of financial performance are higher, relative to non-profit firms. This is intuitive since managers of for-profit foundation owned firms are typically more rewarded for profits than in non-profit firms, though less than in other for-profit firms due to different intensities of firms' profit motives.

There is a lot of room for further studies. Although this paper studies and identifies differences between for-profit foundation owned firms and non-profit firms along several dimensions, it would be helpful to analyze further aspects of labor policy, such as executive compensation. In addition, a further investigation of firm cultures driven by different strengths of the profit motive would contribute to a refined understanding. I leave these interesting issues for further research.

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