

Insider Trading and Initial Public Offerings in Family Firms

DISSERTATION
of the University of St.Gallen,
School of Management,
Economics, Law, Social Sciences,
International Affairs and Computer Science,
to obtain the title of
Doctor of Philosophy in Management

submitted by

Tobias H. Schori

from

Herrliberg (Zurich)

Approved on the application of

Prof. Dr. Thomas Zellweger

and

Prof. Dr. Stefan Morkötter

Dissertation no. 5146

Difo-Druck GmbH, Untersiemau 2021

The University of St.Gallen, School of Management, Economics, Law, Social Sciences, International Affairs and Computer Science, hereby consents to the printing of the present dissertation, without hereby expressing any opinion on the views herein expressed.

St.Gallen, May 18, 2021

The President:

Prof. Dr. Bernhard Ehrenzeller

Dedicated to my beloved parents.

Acknowledgements

Indubitably, it would have been impossible for me to complete this dissertation without invaluable help from numerous people. Foremost, I would like to thank Prof. Dr. Thomas Zellweger in his role as supervisor and co-author for his farsighted guidance, continuous motivation and invaluable support in helping me complete this dissertation. I'm particularly grateful to Thomas for unremittingly challenging my thought process along the way and for urging me to go beyond the obvious to explore the most intriguing aspects of my research projects. Without having had the unique opportunity to benefit from Thomas' vast academic experience and profound insights, this dissertation would undeniably be at a very different stage of development.

I'm thankful to Prof. Dr. Stefan Morkötter in his role as co-supervisor of this dissertation for his academic input and countless feedback as well as for his cooperation as a co-author of the first article. In addition, I would like to extend my gratitude to Prof. Dr. Christine Scheef for her advice and support in conceptualizing and refining my research projects during our joint time in Singapore and for taking the time to meticulously review and discuss my articles. I would also like to thank Prof. Dr. Daniel Wolfenzon for his generous hospitality and the fruitful discussions during my research stay as a visiting scholar at Columbia Business School at Columbia University.

I am indebted to my family, Doris, Hans and Rebecca, for their continuous support and encouragements over the past years and in particular for their generous hospitality and much-needed motivation while I was living in Switzerland during the final phase of my dissertation project.

最后，我要对靖智无尽的支持，动力和爱表示感谢。是她充满活力且乐观的生活态度让我写这篇论文的过程变得更加容易，尤其是在死胡同逼近的时候。对于我们共同的记忆，我将永远感激。

Singapore, February 2021

Tobias Schori

[This page intentionally left blank]

Table of contents

List of figures	vi
Abstract	vii
Zusammenfassung.....	viii
Chapter I – Introduction.....	2
Chapter II – Insider Trading in Family Firms: Impact of Family Ties and Management Involvement	24
Chapter III – Does Capital Forster Growth Opportunities? A Growth Options Perspective on Newly Public Family Firms	84
Chapter IV – Financial Stewardship in Newly Public Family Firms	138

List of figures

Figure 1: Overview of dissertation structure	22
--	----

Abstract

This dissertation centers around insider trading and Initial Public Offerings (IPO) in family firms and explores how family ownership and family managerial involvement affect financial behavior and outcomes.

The first article investigates how family ties in family firms affect insider trading behavior and the propensity towards information exploitation and information leakages. Corporate insiders often possess material, non-public information which they may exploit for their own purposes or leak to outside market participants. Using insider trading data of U.S. publicly listed family firms on trading profitability and short-sale volumes, the study disentangles the trading behavior of insiders who are personally related to the founding family from those without such a family relationship and examines the role of managerial involvement in their trading behavior. The findings contribute to research on insider trading heterogeneity and informed trading.

The second article explores the investment behavior in growth opportunities in newly public family firms, compared to that of newly public nonfamily firms. When family firms conduct an IPO, they are often confronted with a trade-off of economic and noneconomic considerations. Using a real options perspective, the study suggests that family firms may accept an initial loss of noneconomic wealth at the point of going public but invests more of their proceeds into growth opportunities that offer future financial compensation, compared to nonfamily firms. The study further explores uncertainty dimensions as boundary conditions where such investments are particularly risky but also offer a potentially higher future payoff for family firms. The hypotheses are tested based on hand-collected data of U.S. IPO firms. The study contributes to research on family firm IPOs and highlights the importance of firm heterogeneity in the context of real options theory.

The third article examines how going public affects financial stewardship behavior in family firms, compared to nonfamily firms. While stewardship theory suggests that family firms tend to make farsighted financial management decisions, a firm's organizational context must concurrently be designed to enable and support such stewardship behavior. The article is based on a hand-collected sample of newly public U.S. firms and investigates how a change from private to public ownership, and thereby a change in the organizational context, impacts financial stewardship behavior in family firms, compared to nonfamily firms. In this context, the study also explores the role of nonfamily blockholders and two dimensions family influence. The article contributes to literature on stewardship theory and financial behavior in family firms.

Zusammenfassung

Diese Dissertation betrachtet Insiderhandel und Börsengänge (IPO) in Familienunternehmen und untersucht, wie sich Familienbesitz und der Einfluss von Familienmanagern auf finanzielles Verhalten in Familienunternehmen auswirken.

Der erste Artikel untersucht, wie sich familiäre Bindungen in Familienunternehmen auf das Verhalten im Insiderhandel und der Neigung zur Ausnutzung von Informationen und Informationsverbreitung auswirken. Unternehmensinsider verfügen oft über materielle, nicht öffentliche Informationen, die sie für ihre eigenen Zwecke nutzen oder an externe Marktteilnehmer weitergeben können. Anhand von zwei Datensätzen von börsennotierten US-Familienunternehmen zu Rentabilität von Insiderhandel und Leerverkäufen untersucht die Studie das Handelsverhalten von Insidern, die persönlich mit der Gründerfamilie verwandt sind, im Vergleich zu Insidern ohne eine solche Familienbeziehung und berücksichtigt die Rolle von Managementpräsenz von Insidern am Handelsverhalten. Die Studie trägt zur Erforschung von Insider-Heterogenität bei und erweitert Erkenntnisse zu Insiderhandel in Familienunternehmen.

Der zweite Artikel untersucht das Investitionsverhalten in Wachstumsopportunitäten in Familienunternehmen. Bei einem IPO von Familienunternehmen werden sie häufig mit einem Trade-off zwischen wirtschaftlichen und nichtwirtschaftlichen Überlegungen konfrontiert. Unter Anwendung von Realoptionstheorie legt die Studie nahe, dass Familienunternehmen zum Zeitpunkt des Börsengangs einen anfänglichen Verlust an nichtwirtschaftlichem Vermögen akzeptieren, aber einen größeren Teil ihres Erlöses in Wachstumschancen investieren, die künftige finanzielle Kompensationen bieten. Die Hypothesen werden basierend auf Daten von U.S.-amerikanischen IPO-Firmen getestet. Die Studie erweitert die Forschung zu Börsengängen von Familienunternehmen und der Realoptionstheorie.

Der dritte Artikel untersucht das Financial Stewardship Verhalten von Familienunternehmen im Vergleich zu Nichtfamilienunternehmen nach einem Börsengang. Während die Stewardship-Theorie postuliert, dass Familienunternehmen dazu neigen, weitsichtige finanzielle Entscheidungen zu treffen, muss gleichzeitig der organisatorische Kontext eines Unternehmens so gestaltet sein, dass Stewardship-Verhalten überhaupt ermöglicht wird. Der Artikel basiert auf einem Datensatz von neu börsennotierten U.S.-amerikanischen Unternehmen und untersucht, wie sich eine Transition von privatem zu öffentlichem Eigentum und damit eine Änderung des organisatorischen Kontextes auf Financial Stewardship auswirkt. Der Artikel trägt zur Literatur zu Stewardship-Theorie und zur Forschung zu finanziellem Verhalten in Familienunternehmen bei.

[This page intentionally left blank]

Chapter I

Introduction

1 BACKGROUND AND RELEVANCE

Family firms constitute a dominant organizational form around the world, whether they are privately held or listed on public stock markets (La Porta et al., 1999). Seminal work shows that financial behavior and outcomes in family firms significantly differ from that in nonfamily firms, for example with respect to financial performance (Miller et al., 2007; Anderson & Reeb, 2003a), value creation (Villalonga & Amit, 2006), capital structure (Anderson & Reeb, 2003b), financial stewardship (Neckebrouck et al., 2018; Le Breton-Miller et al., 2011), investment behavior (Gomez-Mejia et al., 2018; Chrisman & Patel, 2012), risk appetite (Gomez-Mejia et al., 2007) or informed trading (Anderson et al., 2012). For example, Anderson and Reeb (2003a) show that family firms financially outperform nonfamily firms and that the presence of a family CEO in family firms enhances family firm performance. Villalonga and Amit (2006) on the other hand find that while founder CEOs in family firms create value, firm value is destroyed when descendants serve as CEOs. Developing a holistic understanding of financial behavior and outcomes in family firms thus forms a core element in gaining insights into how family firms work as a whole.

Financial behavior and outcomes in family firms may differ from that of nonfamily firms for several reasons. First, ownership and management in family firms are often not separated but conflated (Anderson & Reeb, 2004; Schulze et al., 2003). In opposite to classical agency theory, suggesting that agency costs may arise due to the separation of ownership and management (Jensen & Meckling, 1976), family firms may thus experience lower agency costs which should result in financial outperformance (Anderson & Reeb, 2003a). However, the conflation of management and ownership can also result in nepotism (Schulze et al., 2003) and deleterious agentic financial behavior where family influence on management is high (Le Breton-Miller et al., 2011). In addition, the family does not necessarily comprise a uniform group, but is often a heterogeneous body with diverse interests. For example, diverging interest between different generational stages (Gomez-Mejia et al., 2007), executive susceptibility (Le Breton-Miller et al., 2011) or relational embeddedness (Bird & Zellweger, 2018) within the family group are all factors shown to influence financial outcomes in family firms. Second, the presence

of a family may also affect the goal-setting and financial motives in family firms (Gomez-Mejia et al., 2007), which often emerges into a “peculiar financial logic” (Michiels & Molly, 2017). While traditional Finance literature assumes that firms aim to maximize financial wealth and shareholder value (e.g., Modigliani & Miller, 1958), family firms may instead also focus on noneconomic utility which they derive from their ownership. For example, research suggests that family firms are willing to forgo financial gains to preserve their noneconomic utility, or socioemotional wealth (e.g., Gomez-Mejia et al., 2018; Kotlar et al., 2017; Leitterstorf & Rau, 2014; Chrisman & Patel, 2012; Gomez-Mejia et al., 2007). Thus, the notion that family firms are purely value-maximizing may need to be treated with caution. Third, family owners are often emotionally attached to their firm (Gomez-Mejia et al., 2007; Bubolz, 2001) and identify themselves with their firm (Zellweger et al., 2011; Eddleston et al., 2010) which may affect financial decision-making in family firms. For example, reputational concerns (Gomez-Mejia et al., 2007) as well as intentions for transgenerational control (Zellweger et al., 2012), as a result from personal involvement and firm identification, may affect financial outcomes. Emotional attachment of family owners to the firm may also result in closer alignment of owner-management interests and foster a collectivistic and pro-organizational behavior (Madison et al., 2016; Miller et al., 2008). As an example, financial stewardship behavior, i.e., farsighted financial management, may thus be particularly pronounced in family firms (Neckebrouck et al., 2018).

The overarching goal of this dissertation is to explore how insider trading and Initial Public Offerings (IPOs) are affected by family ownership and family managerial involvement in family firms. The dissertation contributes to the growing literature on financial behavior and outcomes in family firms in both Finance and Strategy literature and provides a diverse set of vantage points on how family owner may shape financial behavior and outcomes in family firms. While research has come a long way in analyzing the peculiar financial logic of family firms (e.g., Michiels & Molly, 2017), many areas of interest remain unexplored and offer promising potential for further investigation. For example, there is limited systematic research towards developing a better understanding how financial behavior of family members differs compared to individuals

who are not related to the founding family (Schulze et al., 2003). Family members apply a distinct set of belief systems and motivations (Gomez-Mejia et al., 2007) and are often emotionally attached to their firm (Bubolz, 2001). Concurrently, the conflation of management and ownership in family firms can lead to self-control problems and agentic managerial behavior (Schulze et al., 2003; 2001). Furthermore, research has predominantly focused on analyzing financial behavior of either privately held or publicly listed family firms. These two types of organizational contexts differ substantially with respect to financial decision-making (Michiels & Molly, 2017; Madison et al., 2016). However, empirical studies that investigate how changes in ownership settings and organizational contexts affect financial behavior and outcomes are scarce. Lastly, research also stresses the importance of institutional blockholders on family firm financial outcomes (Cacciotti & Ucbasaran, 2018; Leitterstorf & Wachter, 2016). Thereby, large, institutional blockholders can exert a crucial monitoring function over family ownership and family management (Anderson & Reeb, 2004; Bennedsen & Wolfenzon, 2000) but family firms are also prone to conflicts of interests where goals of family and institutional blockholders diverge (Zellweger & Kammerlander, 2015; Nagar et al., 2009). Thus, establishing a comprehensive knowledge of the contextual role of institutional blockholders and its effects on financial behavior in family firms seems crucial in disentangling the financial logic in family firms.

In sum, interest in financial behavior and outcomes in family firms has gained increasing attention over the last two decades and literature encompasses numerous studies exemplifying the peculiar financial logic of family firms. Concurrently, the empirical evidence and theoretical advances also open new avenues for research within this literature stream. As outlined, this dissertation explores financial behavior and outcomes in family firms in the context of insider trading and IPOs. Against this backdrop, the guiding research question for this dissertation is defined as follows.

How does family ownership and managerial involvement affect insider trading and Initial Public Offerings in family firms?

The following chapters provide a brief overview of the structure of this dissertation as well as more detailed descriptions of each individual article which comprise this dissertation. Each article description includes the identification of the research question, the theoretical background, a description of the sample and methodology as well as its main scientific contributions.

2 STRUCTURE OF THIS DISSERTATION

This thesis is written as a cumulative dissertation project which consists of three independent research articles. The first article explores the phenomenon of insider trading in family firms, while the second and third article illuminate financial behavior in family firms in the context of Initial Public Offerings. Notably, the three articles are also positioned in different research disciplines. Whereas the first article is positioned in the Finance literature, the second and third article are written for a Management and Strategy audience. Hence, the structure, positioning and methodological approach across the research articles differs to some extent to account for divergent requirements in academic Finance and Management research, respectively. The goal of this dissertation is to provide a nuanced view on financial behavior and outcomes in family firm as it includes empirical evidence and theoretical vantage points from both Finance and Management research.

3 ARTICLE 1

The first article in this dissertation is an empirical study positioned in the area of insider trading within the Finance literature. The study is motivated by the observation that family firm are particularly prone to certain forms of informed trading and information leakages (Sun & Yin, 2017; Anderson et al., 2012). However, a central question remains unaddressed: where does the insider trading within family firms originate from? Literature shows that insider trading behavior can be affected by an insider's characteristics, such as age and gender (Hillier et al., 2015) or personal wealth (Kallunki et al., 2018)

as well as information access (Wang et al., 2012) and exposure towards external scrutiny (Knewton & Nofsinger, 2014). In family firms, management boards often consist of family members with a personal relationship to the founding family and nonfamily members which have different belief systems and motivations (Villalonga et al., 2015; Gomez-Mejia et al., 2007) and vary with respect to access to privileged information (Sun & Yin, 2017). This raises the question if and how family affiliation affects insider trading behavior. Theoretical arguments on both sides exist to suggest that either family members or nonfamily members are more prone to exploit information asymmetries. For the first article, we identify the following research question.

How do family ties in family firms affect an insider's propensity towards information exploitation and information leakage and how does an insider's managerial involvement moderate this relationship?

3.1 Theory

Research shows that insiders achieve personal gains by exploiting information asymmetries based on material, non-public information (Kallunki et al., 2016; Hillier et al., 2015; Lakonishok & Lee, 2001). An organizational form in which insider trading and information leakages are particularly pronounced are family firms (Sun & Yin, 2017; Anderson et al., 2012). In family firms, management boards are often heterogenous, consisting of both family as well as nonfamily members who apply different belief systems, have different personal motivations, and vary with regards to their risk appetite (Villalonga et al., 2015; Gomez-Mejia et al., 2007). Since differences in personal traits may have a significant effect on an insider's disposition towards information exploitation (e.g., Kallunki et al., 2018; 2016; Hillier et al., 2015) it is an important issue to investigate how family insiders, i.e., insiders who are personally related to the founding family, differ from nonfamily insiders, i.e., insiders without a family relationship, in their

behavior to exploit information asymmetries. Moreover, in family firms, such behavior may not be only constrained to family insiders who are actively involved in the firm management (which we label corporate insiders) but may also extent to significant family shareholders. Such shareholders (which we label non-corporate insiders) generally have only limited access to privileged information as they are not part of the active management (Lakonishok & Lee, 2001). However, in family firms, family shareholders may gain access to privileged information due to their personal ties to the family insiders in firm management while avoiding regulatory scrutiny (Anderson et al., 2012).

In our first study, we investigate two related forms of insider trading, i.e., corporate insider trading and information leakage. SEC Act Section 10(b) as well as SEC Rule 10b-5 prohibit both the exploitation of material, non-public information for personal benefits (i.e., corporate insider trading) as well as tipping such information to market outsiders (i.e., information leakage). However, whereas corporate insider trading primarily benefits the insider personally and these activities are under close regulatory scrutiny, information leakage primarily benefits outside market participants and is being less scrutinized.

First, we build on insider trading heterogeneity literature (e.g., Kallunki et al., 2018; Hillier et al., 2015) and explore how family ties in family firms affect an insider's propensity towards information exploitation and the profitability of insider trading. Our hypotheses suggest that family insiders generate higher abnormal returns compared to nonfamily insiders for insider purchases. For insider sales, transactions that imply significant litigation and reputational risks, we suggest that insider trading profitability is lower for family insiders compared to nonfamily insiders. Our empirical strategy also distinguishes between family insiders who are actively involved in the firm and family insiders who are just significant shareholders and thus under lower regulatory scrutiny (Lakonishok & Lee, 2001). We suggest that for insider sales, transactions which encompass significant legal and reputational risks (Dai et al., 2016), the profitability of insider sales will be higher for family non-corporate insiders, compared to family corporate insiders.

Second, we explore how family affiliation and managerial involvement affect information leakages in family firms (Sun & Yin, 2017; Anderson et al., 2012). We therefore extend our theoretical framework where we distinguish between four types of insiders in family firms and explore how these types differ with respect to information leakages. We suggest that family insiders are less prone to leak information than non-family insiders, in line with Sun & Yin (2017). However, we theorize that family insiders who are not part of the management are more prone to leak information than family insiders with management involvement since they are under less public scrutiny and may be less attached to the founding family.

3.2 Sample and methodology

To test our hypotheses, we draw on a sample of 37'012 open-market insider transactions by 4'222 individual insiders in 241 U.S. publicly listed family firms. We hand-collect family ownership and management data from SEC proxy statements, obtain insider trading data from WRDS/Thomson Reuters database and retrieve firm-level accounting and insider-level market data from CRSP/Compustat. In our data collection procedure, we closely follow contemporary insider trading and family firm literature (e.g., Dai et al., 2016; Gider & Westerheide, 2016; Hillier et al., 2015; Anderson et al., 2012). We test our hypotheses by estimating the effect of family affiliation and managerial involvement on buy-and-hold abnormal returns using a OLS two-way fixed effects models with varying model specifications. In addition, we collect an independent sample to explore information leakages in family firms where we analyze abnormal short-sales volume around insider sales. For our second sample, we retrieve short-selling data from the WRDS/ Reg SHO - NYSE Short Sales database and match daily short-selling data with our insider sale data from the first sample. We identify 126'978 daily short sales volumes around a 21-day window of 6'051 insider sales. To test our hypotheses in the second sample, we use a two-way fixed effect event study method.

3.3 Scientific contribution

In this study, we investigate whether insiders who are personally related to the founding family in family firms are more prone to exploit their information advantages compared to insiders without a family relationship. The study contributes to research on insider trading heterogeneity (e.g., Kallunki et al., 2018; Kallunki et al., 2016; Hillier et al., 2015) by providing evidence that family ties in family firms may significantly affect insider trading profitability. Our results lend support to the notion that family and non-family insiders are two separate insider groups with distinct sets of personal values, motives, and attitudes toward risk (Gomez-Mejia et al., 2007). We further contribute to research on information leakages and informed trading in family firms (Sun & Yin, 2017; Anderson et al., 2012) as we explore different types of insiders and their propensity to leak information to market participants. Importantly, in the context of family firms, we propose a new channel of information exploitation and leakages as we not only distinguish between family and nonfamily insiders but also whether they are involved in the active management or just substantial shareholders. In sum, we aim to contribute to a more profound understanding of insider trading behavior in family firms and to add to the ongoing discussion of the importance of insider heterogeneity on insider trading profitability.

4 ARTICLE 2

The second article explores growth opportunities in newly public family firms and is positioned in the Management/Strategy literature. As firms go public, they gain access to new capital which can be used to finance growth projects and promising growth opportunities (Reuer & Tong, 2010; Certo et al., 2009). For family firms, an Initial Public Offering (IPO) is often a double-edged sword as they may be confronted with a trade-off of economic as well as noneconomic considerations (Kotlar et al., 2017; Leitterstorf & Rau, 2014). While an IPO offers family firms an opportunity to further grow their business and thus increase economic wealth, going public also induces a new ownership structure, dilution of family control and additional, external regulatory requirements, all

of which may have deleterious effect on noneconomic wealth (Kotlar et al., 2017). Despite these potentially detrimental consequences, many family firms decide to go public and retain family control (Villalonga & Amit, 2006; Anderson & Reeb, 2003a). We suggest that as family firms go public, they may accept a loss of noneconomic wealth but compensate such a loss with higher investment in real options to achieve higher future expected financial wealth. For the second article, we identify the following research question.

How does new capital affect growth opportunities in newly public family firms and what role does uncertainty play in moderating this relationship?

4.1 Theory

In this paper, we use real options theory to explore the relationship between new capital and growth opportunities and to explain the boundary conditions of technological and market uncertainty. Growth opportunities, defined as investment opportunities with an uncertain future payoff (Myers, 1977), are a key source for firms to create sustainable firm value (Adner & Levinthal, 2004; Myers, 1977). Real options theory is a persuasive theoretical perspective for our purpose because it is frequently applied to study investment decisions on a firm level (e.g., Reuer & Tong, 2010, Tong & Li, 2011). In addition, conceding to a real options logic, investments in growth opportunities are a result of a firm's ability and willingness to commit to such investments, and thus a result of managerial investment decisions (Reuer & Tong, 2005). Myers (1997) suggests that firm value consists of both the present value of cash flows as well as the present value of growth opportunities. Thus, real options theory proposes that part of the firm value is comprised of future, unrealized growth potential. In developing our theoretical framework, we suggest that the capital raised during the public offering will positively influence growth option value since more available funding may allow for larger initial

investment commitments (Fisch, 2008; Miller & Folta, 2002), increases investment flexibility (Tong & Li, 2013; 2011) and reduces the likelihood of having to choose between competing growth opportunities (Fisch & Zschoche, 2012). For newly public family firms, we expect this relationship to be particularly pronounced as investments in growth options exhibit an asymmetrical risk distribution (McGrath & Neckar, 2004) and long-term payoff structure (Alessandri et al., 2012) which coincide with the risk profile of family ownership in family firms. We suggest that newly public family firms may use such investments in real options as a means to financially compensate for their loss of noneconomic wealth after the public offering (Kotlar et al., 2017).

We lastly explore two boundary conditions of our theoretical framework and study market and technological uncertainty. Real options theory suggests that the value of real options is contingent on the level of a firm's business uncertainty (Adner & Levinthal, 2004; Levitas & Chi, 2010). In our study, we focus on two complementary forms of exogenous uncertainty, i.e., technological and market uncertainty. Because uncertainty implies heightened risks for the family firm and their noneconomic wealth embedded in the firm, we expect uncertainty to attenuate the positive effect on growth opportunities as larger initial risks to the business require further future financial compensation.

4.2 Sample and methodology

This paper is an empirical study based on a hand-collected sample of 591 IPO firms that went public in the United States between 2004 and 2007. We track IPO firms over a maximum of five years after going public (e.g., Acharya & Pollock, 2013) and our final sample comprises 2,213 firm-year observations. We manually extract firm-level information regarding family ownership and family managerial involvement from SEC IPO prospect filings. We merge our data with IPO information from the SDC Platinum database (Lungeanu & Zajac, 2016) as well as Thomson Reuters for firm-level accounting and financial information. Data regarding market uncertainty is compiled from the Bureau of Economic Analysis at the U.S. Department of Commerce for the years of 1947 to 2012. In our main analysis, we use a two-way OLS fixed-effects panel data estimation approach using moderated hierarchical multiple regressions to test our hypotheses. In

supplementary tests, we re-estimate our results using a Propensity Score Matching approach to address concerns regarding endogeneity and unobserved heterogeneity (Neckebrouck et al., 2018; Dehejia & Wahba, 2002). To ensure robustness, we further examine the influence of institutional, nonfamily investors on growth opportunities as a counterfactual condition and use several alternate definitions of family firm presence and growth opportunities as our focal variables in our model specifications.

4.3 Scientific contribution

Our study makes several contributions to the literature. We aim to extend IPO research in family firms (e.g., Kotlar et al., 2017; Leitterstorf & Rau, 2014) and offer an explanation how family firms may adjust their strategic decision-making to financially compensate for the loss of noneconomic wealth, addressing recent calls from Kotlar et al. (2017). While the notion that family firms display a loss-averse behavior towards noneconomic wealth and are willing to forgo financial benefits, little is known how this behavior alters once noneconomic wealth is lost (e.g., Zellweger et al., 2012). Furthermore, we contribute to real options theory by investigating the family firm, as a distinct organizational form, and the effects of firm heterogeneity on growth option value (Alessandri et al., 2012). Our study thereby emphasizes the important role of firm heterogeneity in growth option value (Adner & Levinthal, 2004). Lastly, we add to real options literature in the context of IPOs (e.g., Reuer & Tong, 2010) and aim to explain how newly public firms may capture value from a public offering (Certo et al., 2009; Ritter & Welch, 2002) by using a real options logic.

5 ARTICLE 3

The third article is an empirical study exploring financial stewardship behavior in family firms and is positioned in the Management/Strategy literature. Financial stewardship, which we define as farsighted financial management (Neckebrouck et al., 2018), may be particularly prevalent among family firms as family owners are often emotionally attached to the firm (Bubolz, 2001; Gomez-Mejia et al., 2007), have substantial equity

stakes in their firm (Anderson & Reeb, 2004) and are concerned about the long-term survival of their businesses (Le Breton Miller et al., 2011; Miller et al., 2008). Against this backdrop, we investigate how a change in organizational context affects financial stewardship behavior in family firms, compared to nonfamily firms. In their work on stewardship theory, Davis et al. (1997) and Donaldson (1990) propose that for stewardship behavior to emerge, the organization must be designed in a way that actively enables and promotes such behavior. Indeed, research suggest that stewardship behavior may be dependent on the organizational context, such firms are embedded in (Madison et al., 2016; Le Breton-Miller & Miller, 2009; Miller et al., 2008), but direct evidence is missing. We investigate how a change in organizational context affects financial stewardship in the context of Initial Public Offerings, where firms transform from private ownership to public ownership and compare the change in family firms, compared to nonfamily firms. Conceptually, we argue that while private ownership enables the promotion and nurturing of financial stewardship, public ownership has the opposite effect. For example, large, institutional blockholders can affect a family firm's independence in exerting influence over strategic decisions (Nagar et al., 2009; Bennedsen & Wolfenzon, 2000) whereas such conflicts are prone to exacerbate after going public as pressure increases to apply a more short-term investment horizon and to maximize profits (Bruton et al., 2010; Lee & O'Neill, 2003). For the third article, we identify the following research question.

How does going public affect financial stewardship behavior in family firms and what is the role of institutional blockholders and family influence?

5.1 Theory

In this paper, we use stewardship theory as our main theoretical perspective to develop our hypotheses. Stewardship theory suggest that managers are driven by collectivistic

and pro-organizational motivations (Donaldson, 1990) and thereby proposes a competing theoretical perspective to the agency logic (Jensen & Meckling, 1976). Conceding to a stewardship logic, a manager's motivation to contribute to the well-being and success of the firm is amplified by high levels of value identification, loyalty and commitment to the firm (Davis et al., 1997). Following these arguments, family firms are often conceived to be good stewards (Davis et al., 2010; 1997; Miller et al., 2008). Specifically, family owners tend to strongly identify with firm values (Bubolz, 2001), are financially committed (Le Breton-Miller et al., 2011) and are concerned about the long-term survival (Miller et al., 2008). According to stewardship theory, all these factors should positively contribute to financial stewardship in family firms. However, empirical evidence is mixed (Neckebrouck et al., 2018; Le Breton-Miller et al., 2011).

Concurrently, stewardship theory highlights that for stewardship behavior to emerge, the organization must be designed in a way that enables and nurtures such behavior (Donaldson & Davis, 1991; Donaldson, 1990). We expand on their arguments and suggest that financial stewardship depends, in part, on the organizational context, such firms are embedded in. Conceptually, we propose two contrasting forms of organizational contexts within the stewardship literature, i.e., stewardship enabling, in which pro-organizational behavior actively supported and nurtured, and stewardship hindering, in which such behavior is curtailed. For these two contexts, we identify three key components in stewardship theory, i.e., long-term orientation, autonomy and empowerment as well as firm identity. We further explore the effects of non-family blockholder ownership and family influence on financial stewardship within family firms. As firms go public, institutional blockholders may curb a family firm's independence in exerting influence over strategic decisions (Nagar et al., 2009; Bennedsen & Wolfenzon, 2000) whereas conflicts of interests between family and institutional interests emerge with increased pressure on family firm owners to apply a more short-term investment horizon (Lee & O'Neill, 2003). On the other hand, we suggest that family involvement is positively related to financial stewardship, so that family firms with higher family involvement are better able to deal with the organizational challenges as a result of evolving from a stewardship enabling to a stewardship hindering context.

5.2 Sample and methodology

We test our hypotheses based on a hand-collected panel dataset comprising 533 IPO firms in the United States between 2004 to 2007. We track IPO firms over a maximum of five years after going public (e.g., Acharya & Pollock, 2013) and include 2'480 firm-year observations in our final sample. The data is compiled from a widely recognized IPO database (Loughran & Ritter, 2004; Ritter & Welch, 2002) and merged with selected information from the SDC Platinum database (e.g., Lungeanu & Zajac, 2016). To identify family firms, we hand-collect family ownership and management information from the SEC IPO prospect filings. To identify non-family blockholder structures within our family firm subsample, we also rely on hand-collected data from SEC IPO prospect filings. We retrieve firm-levels financial information from CRSP/Compustat. To test our hypotheses in our main analysis, we employ a two-way fixed effects panel data estimation approach using moderated hierarchical multiple regression model. To address endogeneity concerns, we further apply two alternative estimation methods. First, to address unobserved heterogeneity, we use a Propensity Score Matching approach (Dehejia & Wahba, 2002). Second, to address self-selection bias, we collect an additional sample of 1,191 U.S. M&A transactions completed between 2004 and 2007 and test our hypotheses using a two-step Heckman model (Certo et al., 2016; Heckman, 1976). To empirically substantiate our main findings, we use an alternative definition of financial stewardship (Le Breton-Miller et al., 2011) and disentangle the effects of the individual components of our financial stewardship index. Moreover, we run several subsample analyses and alternate control vectors in our model specifications.

5.3 Scientific contribution

The third study contributes to stewardship theory and the family business literature. First, we expand on the discussion how the organizational context and governance arrangements in family firms affect steward-like behavior (Madison et al., 2016; Le Breton-Miller et al., 2011; Miller et al., 2008; Davis et al., 2010). We propose two contrasting organizational contexts, i.e., stewardship hindering and stewardship enabling, and suggest that for financial stewardship behavior to prevail, family firms may be

embedded in an organizational context that enables and nurtures such behavior. We thus add to a more nuanced understanding under what circumstances family firm financial stewardship may emerge and reconcile mixed evidence in previous work (Neckebrouck et al., 2018; Le Breton-Miller et al., 2011). In addition, we show how financial stewardship behavior may evolve over time (Le Breton-Miller, 2011; Miller et al., 2008) and add a dynamic component to stewardship theory, suggesting that stewardship behavior may indeed change as firms evolve over time. Third, our findings illuminate how the presence of institutional blockholders can moderate stewardship behavior in family firms (Cacciotti & Ucbasaran, 2018; Fattoum-Guedri et al., 2018; Bennedsen & Wolfenzon, 2000). We thereby highlight the relevance of non-family blockholder influence on financial outcomes in family firms (Cacciotti & Ucbasaran, 2018; Leitterstorf & Wachter, 2016) and illuminate potential areas of exacerbating conflicts of interests between family owners and nonfamily blockholders.

To summarize, this dissertation comprises three independent articles which are positioned both in the Finance (Article 1) as well as the Management/Strategy (Article 2 and 3) literature. Figure 1 provides an overview of the dissertation structure and summarizes key aspects of each of the three articles. The remaining part of this dissertation is organized along the three individual studies. Specifically, Chapter II presents the first article, Chapter III includes the second article and Chapter IV comprises the third article.

References

- Acharya, A.G. & Pollock, T.G. (2013). Shoot for the Stars? Predicting the Recruitment of Prestigious Directors at Newly Public Firms. *The Academy of Management Journal* **56**(5): 1396–1419.
- Adner, R. & Levinthal, D. (2004). What is not a real option: Considering boundaries for the application of real options to business strategy. *Academy of Management Review* **29**: 74–85.

- Alessandri, T.M., Tong, T.W. & Reuer, J.J. (2012). Firm heterogeneity in growth option value: The role of managerial incentives. *Strategic Management Journal* **33**: 1557–1566.
- Anderson, R.C. & Reeb, D.M. (2003a). Founding-Family ownership and Firm Performance: Evidence from the S&P 500. *The Journal of Finance* **63**: 1301–1328.
- Anderson, R.C. & Reeb, D.M. (2003b). Founding-family ownership, corporate diversification, and firm leverage. *Journal of Law & Economics* **46**: 653–684.
- Anderson, R.C. & Reeb, D.M. (2004). Board Composition: Balancing Family Influence in S&P 500 Firms. *Administrative Science Quarterly* **49**(2): 209–237.
- Anderson, R.C., Reeb, D.M. & Zhao, W. (2012). Family-Controlled Firms and Informed Trading: Evidence from Short Sales, *The Journal of Finance* **67**(1): 351–385.
- Bennedsen, M. & Wolfenzon, D. (2000). The balance of power in closely held corporations. *Journal of Financial Economics* **58**: 113–139.
- Bird, M., Zellweger, T.M. (2018) Relational embeddedness and firm growth: Comparing spousal and sibling entrepreneurs. *Organization Science* **29**(2): 264–283.
- Bruton, G. D., Filatotchev, I., Chahine, S. & Wright, M. (2010). Governance, ownership structure, and performance of IPO firms: The impact of different types of private equity investors and institutional environments. *Strategic Management Journal* **31**: 491–509.
- Bubolz, M. (2001). Family as a source, user and builder of social capital. *Journal of Socio-Economics* **30**(2): 129–131.
- Cacciotti, G. & Ucbasaran, D. (2018). Commentary: Blockholder Structures and Power Mechanisms in Family Firms. *Entrepreneurship Theory and Practice* **42**(2): 252–258.
- Certo, S.T., Busenbark J.R., Woo, H.S. & Semadeni, M. (2016). Sample selection bias and Heckman models in strategic management research. *Strategic Management Journal* **37**: 2639–2657.
- Certo, S.T., Holcomb, T.R. & Holmes, R.M. (2009). IPO research in management and entrepreneurship: Moving the agenda forward. *Journal of Management* **35**(6): 1340–1378.
- Chrisman, J.J. & Patel, P.C. (2012). Variations in R&D investments of family and non-family firms: Behavioral agency and myopic loss aversion perspectives. *The Academy of Management Journal* **55**: 976–997.
- Dai, L., Fu, R., Kang, J.K. & Lee, I. (2016). Corporate governance and the profitability of insider trading. *Journal of Corporate Finance* **40**: 235–253.
- Davis, J.H., Allen, M.R. & Hayes, H.D. (2010). Is Blood Thicker Than Water? A Study of Stewardship Perceptions in Family Business. *Entrepreneurship Theory and Practice* **34**(6): 1093–1116.
- Davis, J.H., Schoorman, F.D. & Donaldson, L. (1997). Toward a stewardship theory of management. *The Academy of Management Review* **22**: 20–47.
- Dehejia, R.H. & Wahba, S. (2002). Propensity score-matching methods for nonexperimental causal studies. *Review of Economics and Statistics* **84**(1): 151–161.

- Donaldson, L. (1990). The ethereal hand: organizational economics and management theory. *Academy of Management Review* **15**: 369–381.
- Donaldson, L. & Davis, J. (1991). Stewardship theory or agency theory. *Australian Journal of Management* **16**: 49–64.
- Eddleston, K.A., Kellermanns, F.W. & Zellweger, T.M. (2010). Exploring the Entrepreneurial Behavior of Family Firms: Does the Stewardship Perspective Explain Differences? *Entrepreneurship Theory and Practice* **36**(2): 347–367.
- Fattoum-Guedri, A., Guedri, Z. & Delmar, F. (2018). Multiple Blockholder Structures and Family Firm Performance. *Entrepreneurship Theory and Practice* **42**(2): 231–251.
- Fisch, J.H. & Zschoche, M. (2012). The role of operational flexibility in the expansion of international production networks. *Strategic Management Journal* **33**(13): 1540–1556.
- Gider, J. & Westerheide, C. (2016). Relative idiosyncratic volatility and the timing of corporate insider trading. *Journal of Corporate Finance* **39**: 312–334.
- Gomez-Mejia, L., Patel, P. & Zellweger, T. (2018). In the Horns of the Dilemma: Socioemotional Wealth, Financial Wealth, and Acquisitions in Family Firms. *Journal of Management* **44**(4): 1369–1397.
- Gomez-Mejia, L.R., Haynes, K., Nunez-Nickel, M., Jacobson, K.J.L. & Moyano-Fuentes, J. (2007). Socioemotional wealth and business risks in family-controlled firms: evidence from Spanish olive oil mills. *Administrative Science Quarterly* **52**(1): 106–137.
- Heckman, J.J. (1976). The common structure of statistical models of truncation, sample selection and limited dependent variables and a simple estimator for such models. *Annals of Economic and Social Measurement* **5**(4): 475–492.
- Hillier, D., Korczak, A. & Korczak, P. (2015). The impact of personal attributes on corporate insider trading. *Journal of Corporate Finance* **30**: 150–167.
- Jensen, M.C. & Meckling, W.H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics* **3**: 305–360.
- Kallunki, J.P., Kallunki, J.P., Nilsson, H. & Puhakka, M. (2018). Do an insider's wealth and income matter in the decision to engage in insider trading? *Journal of Financial Economics* **130**(1): 135–165.
- Kallunki, J.P., Mikkonen, J., Nilsson, H. & Setterberg, H. (2016). Tax noncompliance and insider trading. *Journal of Corporate Finance* **36**: 157–173.
- Knewton, H.S. & Nofsinger, J.R. (2014). Why are CFO insider trades more informative? *Managerial Finance* **40**(2): 157–175.
- Kotlar, J., Signori, A., De Massis, A. & Vismara, S. (2017). Financial Wealth, Socioemotional Wealth and IPO Underpricing in Family Firms: A Two-Stage Gamble Model. *The Academy of Management Journal* **61**(3): 1073–1099.

- Kotlar, J., Signori, A., De Massis, A. & Vismara, S. (2017). Financial Wealth, Socio-emotional Wealth and IPO Underpricing in Family Firms: A Two-Stage Gamble Model. *The Academy of Management Journal* **61**(3): 1073–1099.
- La Porta, R., Lopez-de-Silanes, F. & Shleifer, A. (1999). Corporate ownership around the world. *Journal of Finance* **54**: 471–517.
- Lakonishok, J. & Lee, I. (2001). Are insider trades informative? *Review of Financial Studies* **14**: 79–111.
- Le Breton-Miller, I., Miller, D. & Lester, R.H. (2011). Stewardship or Agency? A Social Embeddedness Reconciliation of Conduct and Performance in Public Family Businesses. *Organization Science* **22**(3): 704–721.
- Lee, P.M. & O'Neill, H.M. (2003). Ownership structures and R&D investments of U.S. and Japanese firms: Agency and stewardship perspectives. *The Academy of Management Journal* **46**(2): 212–225.
- Leitterstorf, M.P. & Rau, S.B. (2014). Socioemotional wealth and IPO underpricing of family firms. *Strategic Management Journal* **35**(5): 751–760.
- Leitterstorf, M.P. & Wachter, M. (2016). Takeover Premiums and Family Blockholders. *Family Business Review* **29**(2): 214–230.
- Levitas, E. & Chi, T. (2010). A look at the value creation effects of patenting and capital investment through a real options lens: The moderating role of uncertainty. *Strategic Entrepreneurship Journal* **4**: 212–233.
- Loughran, T. & Ritter, J.R. (2004). Why Has IPO Underpricing Increased Over Time? *Financial Management* **33**: 5–37.
- Lungeanu, R. & Zajac, E.J. (2016). Venture capital ownership as a contingent resource: How owner-firm fit influences IPO outcomes. *The Academy of Management Journal* **59**(3): 930–955.
- Madison, K., Holt, D.T., Kellermanns, F.W. & Ranft, A.L. (2016). Viewing family firm behavior and governance through the lens of agency and stewardship theories. *Family Business Review* **29**(1): 65–93.
- McGrath, R.G. & Nerkar, A. (2004). Real options reasoning and a new look at the R&D investment strategies of pharmaceutical firms. *Strategic Management Journal* **25**: 1–21.
- Michiels, A. & Molly, V. (2017). Financing Decisions in Family Businesses: A Review and Suggestions for Developing the Field. *Family Business Review* **30**(4): 369–399.
- Miller, D., Le Breton-Miller, I., Lester, R. & Cannella, A. (2007). Do family businesses outperform? A study of the Fortune 1000. *Journal of Corporate Finance* **13**: 829–858.
- Miller, D., Le Breton-Miller, I. & Scholnick, B. (2008). Stewardship vs. stagnation: An empirical comparison of small family and non-family businesses. *Journal of Management Studies* **45**(1): 51–78.
- Modigliani, F. & Miller, M. H. (1958). The cost of capital, corporation finance and the theory of investment. *American Economic Review* **48**: 261–297.

- Myers, S.C. (1977). Determinants of corporate borrowing. *Journal of Financial Economics* **5**: 147–175.
- Nagar, V., Petroni, K.R. & Wolfenzon, D. (2009). Governance Problems in Closely Held Corporations. *Journal of Financial and Quantitative Analysis* **46(4)**: 943–966.
- Neckebrouck, J., Schulze, W. & Zellweger, T. (2018). Are Family Firms Good Employers? *The Academy of Management Journal* **61(2)**: 553–585.
- Reuer, J.J. & Tong, T.W. (2005). Real Options in International Joint Ventures. *Journal of Management* **31(3)**: 403–423.
- Reuer, J.J. & Tong, T.W. (2010). Discovering Valuable Growth Opportunities: An Analysis of Equity Alliances with IPO Firms. *Organization Science* **21(1)**: 202–215.
- Ritter, J. & Welch, I. (2002). A review of IPO activity, pricing, and allocations. *The Journal of Finance* **57(4)**: 1795–1828.
- Schulze, W., Lubatkin, M.H., Dino, R. & Buchholtz, A. (2001). Agency relationships in family firms: theory and evidence. *Organization Science* **12(2)**: 99–116.
- Schulze, W.S., Lubatkin, M.H. & Dino, R.N. (2003). Toward a theory of agency and altruism in family firms. *Journal of Business Venturing* **18(4)**: 473–490.
- Sun, H. & Yin, S. (2017). Information leakage in family firms: Evidence from short around insider sales. *Journal of Corporate Finance* **47**: 72–87.
- Tong, T.W. & Li, S. (2013). The assignment of call option rights between partners in international joint ventures. *Strategic Management Journal* **34**: 1232–1243.
- Tong, T.W. & Li, Y. (2011). Real Options and Investment Mode: Evidence from Corporate Venture Capital and Acquisition. *Organization Science* **22(3)**: 659–667.
- Villalonga, B. & Amit, R. (2006). How do family ownership, control, and management affect firm value? *Journal of Financial Economics* **80**: 385–417.
- Villalonga, B., Amit, R., Trujillo, M.A., & Guzman, A. (2015). Governance of Family Firms. *Annual Review of Financial Economics* **7**: 635–654.
- Wang, W., Shin, Y. & Francis, B.B. (2012). Are CFOs' trades more informative than CEOs' trades? *The Journal of Financial and Quantitative Analysis* **47**: 743–762.
- Zellweger, T.M. & Kammerlander, N. (2015). Family, wealth, and governance: An agency account. *Entrepreneurship Theory and Practice* **39(6)**: 1281–1303.
- Zellweger, T.M., Kellermanns, F.W., Chrisman, J.J. & Chua, J.H. (2012). Family control and family firm valuation by family CEOs: the importance of intentions for transgenerational control. *Organization Science* **23(3)**: 851–868.
- Zellweger, T.M., Sieger, P. & Halter, F. (2011). Should I stay or should I go? Career choice intentions of students with family business background. *Journal of Business Venturing* **26(5)**: 521–536.

Figure 1: Overview of dissertation structure

	Article 1	Article 2	Article 3
Title	Insider Trading in Family Firms: Impact of Family Ties and Management Involvement	Does Capital Foster Growth Opportunities? A Growth Options Perspective on Newly Public Family Firms	Financial Stewardship in Newly Public Family Firms
Author(s)	Morkoetter, S.; Schori, T.; Zellweger, T.	Schori, T.	Schori, T.
Research question	How do family ties in family firms affect an insider's propensity towards information exploitation and information leakage and how does an insider's managerial involvement moderate this relationship?	How does new capital affect growth opportunities in newly public family firms and what role does uncertainty play in moderating this relationship?	How does going public affect financial stewardship behavior in family firms and what is the role of institutional blockholders and family influence?
Positioning	Finance	Management/Strategy	Management/Strategy
Level of analysis	Insider/individual-level	Firm-level	Firm-level
Type of study	Empirical	Empirical	Empirical
Theoretical foundation	Insider trading heterogeneity/ informed trading	Real Options Theory	Stewardship Theory
Data	- 37'042 insider trades from 4'222 unique insiders in 241 family firms - 126'978 daily short-sales volumes around 6'051 insider sales - Hand-collected family ownership and management information of U.S. family firms - Insider, accounting and market data collected via WRDS, CRSP and Thomson Reuters	- 591 IPO firms comprising 2'213 firm-year observations - Hand-collected family ownership and family management information of IPO firms from IPO prospect filings - IPO data collected via Ritter (2002) database and SDC Platinum database - Accounting data obtained from Thomson Reuters	- 533 IPO firms comprising 2'480 firm-year observations - Hand-collected family ownership and family management information of IPO firms from IPO prospect filings - IPO data collected via Ritter (2002) database and SDC Platinum database - Accounting data retrieved from Compustat
Analytical approach	- Two-way fixed effects panel regression - Two-way fixed effects event study methodology	- Moderated hierarchical linear regression - Propensity Score Matching	- Moderated hierarchical linear regression - Propensity Score Matching - Heckman Two-Stage-Least-Square
Conference/ submission status	- Accepted at the 2019 Vietnam Symposium, Hanoi (Vietnam) - Accepted and presented at the 2019 Paris Financial Management Conference (PFMC), Paris (France) - Accepted and presented at the 2020 American Finance Association (AFA) PhD Session, San Diego (USA) - Accepted at the 2020 European Financial Management Association (EFMA) Conference, Dublin (Ireland)	- Presented at the 2019 St.Gallen Strategy Colloquium (spring term), St.Gallen (Switzerland) - Accepted at the 2020 Academy of Management (AOM) annual conference, Vancouver (Canada)	- Presented at the 2019 St. Gallen Entrepreneurship Colloquium (spring term), St. Gallen (Switzerland)

[This page intentionally left blank]

Chapter II

Insider Trading in Family Firms:
Impact of Family Ties and
Management Involvement

Insider Trading in Family Firms: Impact of Family Ties and Management Involvement

Stefan Morkoetter ^a

Tobias H. Schori ^b

Thomas Zellweger ^c

Abstract

We study corporate insider trading and information leakages within family firms. We find that the profitability of insider purchases of family insiders is higher compared to those of nonfamily insiders. In contrast, the profitability of insider sales of family insiders is lower compared to those of nonfamily insiders, indicating that family members time their insider trades well when buying shares, but not when selling shares. Further, family insiders without management involvement time their insider sales significantly better, compared to family insiders who are involved in the firm management. Regarding information leakage, abnormal short-selling volumes prior to insider sales are lower when shares are sold by family insiders compared to nonfamily insiders. However, this effect is moderated by an insider's managerial involvement so that short-selling volumes prior to insider sales are higher when shares are sold by family insiders without management involvement, compared to family insiders who are involved in management.

Keywords: *Insider trading, information leakage, family firms*

JEL Codes: G14, G30

^a University of St. Gallen, The St.Gallen Institute of Management in Asia, 111 Amoy Street, Singapore 069931; stefan.morkoetter@unisg.ch

^b University of St. Gallen, The St.Gallen Institute of Management in Asia, 111 Amoy Street, Singapore 069931; tobias.schori@unisg.ch

^c University of St. Gallen, Center for Family Business, Dufourstrasse 40a, 9000 St.Gallen, Switzerland; thomas.zellweger@unisg.ch

1 INTRODUCTION

Insider trading studies show that insiders can generate abnormal returns and achieve personal gains by exploiting information asymmetries based on material, non-public information (Kallunki et al., 2016; Agrawal & Cooper, 2015; Hillier et al., 2015; Lakonishok & Lee, 2001). Despite regulatory and public scrutiny to ensure compliance of insider trading (Dai et al., 2016; Knewton & Nofsinger, 2014; Bettis et al., 2000), family firms have been found to be particularly prone to certain forms of insider trading (Sun & Yin, 2017; Anderson et al., 2012).

As families serves as a controlling owner and their family members are often engaged in the management board and other top executive positions (Anderson & Reeb, 2004; 2003), they may be particularly well positioned to take personal advantage of privileged information access or to leak information outside the family. While Anderson et al. (2012) show that family firms are more prone to informed trading via short sales compared to nonfamily firms, they do not distinguish between different types of insiders within family firms. Sun and Yin (2017) show that abnormal short-selling volumes in family firms are higher around insider sales initiated by nonfamily insiders, compared to family insiders. Yet, they do not offer empirical evidence whether the insider holds a management position within the company or is just a large shareholder. However, for family firms, large shareholders with ties to the founding family but without management involvement are potentially an important group of insiders. These insiders may have access to privileged information via family members who hold a management function, but at the same time are exposed to lower firm-level and regulatory scrutiny (Anderson et al., 2012). The reduced scrutiny potentially offers family insiders without management involvement an opportunity to exploit information asymmetries when engaging in insider trades given limited concerns about legal and reputational consequences. Thus, family ties within the management as well as connections to outside family shareholders may be an important determinant of insider trading activities in family firms.

Conceptually, we group insiders within family firms and their activities along two dimensions, (i) family affiliation and (ii) management involvement. Regarding family

affiliation, we distinguish between family insiders and nonfamily insiders, whereby family insiders belong to the founding family, either by blood or marriage. Regarding management involvement, we distinguish between management insiders who are actively involved in management, as either executives and/or board members, and non-management insiders who are significant shareholders without management involvement. This leaves us with four distinct types of insiders: (1) family management insider, (2) nonfamily management insider, (3) family non-management insider, and (4) non-family non-management insider. Importantly, in our study we focus on heterogeneity within family firms, rather than comparing insider trading activity between family and nonfamily firms (e.g., Anderson et al., 2012).

We investigate two forms of insider trading activity, i.e., corporate insider trading (e.g., Kallunki et al., 2016; Hillier et al., 2015) and information leakage (e.g., Sun & Yin, 2017; Chakrabarty & Shkilko, 2013). We use these two distinct forms because U.S. insider trading regulations such as SEC Section 10(b) or SEC Rule 10b-5, not only prohibit exploiting material, non-public information for personal benefit but also forbid the disclosure of such information either directly or indirectly to outsiders to the firm (known as “tipping”). Whereas the first part of our study investigates how insiders may exploit information asymmetries for their personal benefits while being under scrutiny by market participants and securities regulators (Gider & Westerheide, 2016), information leakages by insiders to outside market participants does not offer a direct benefit to the insiders themselves nor is it directly observable by market participants. To analyze corporate insider trading, we use insider trading data reported between 2005 to 2015 from the Securities and Exchange Commission (SEC) for publicly traded U.S. family firms. We identify 4,222 unique insiders which reported 37,012 open-market insider purchases (3,871) and sales (33,141) in 241 family firms. We measure the profitability of corporate insider trading as abnormal stock returns over 120 trading days after an insider transaction. We use this investment period since profits made within less than 120 days need to be surrendered and cannot be monetized by insiders in accordance with U.S. regulations (Gider & Westerheide, 2016; Jenter, 2005; Jeng et al., 2003). To investigate potential information leakages, we focus on abnormal short-selling volume prior to insider sales (e.g., Sun & Yin, 2017). We use SEC Regulation SHO short-sale data

for a limited period between January 2005 throughout end of June 2007 (e.g., Anderson et al., 2012; Engelberg et al., 2012) comprising 6,051 insider sale events and 126,978 trade-day observations in 127 family firms.

Our study has four main findings. *First*, we find that family insiders earn higher abnormal returns when purchasing firm shares compared to nonfamily insiders. *Second*, in contrast to insider purchases, we find that insider sales by family insiders are less profitable compared to nonfamily insiders. The average abnormal stock return during the subsequent 120 days trading period following an insider sale by a family insider is 2.4% higher as compared to an insider sale by a nonfamily insider when controlling for firm fixed effects, i.e., we observe a significantly smaller abnormal price decrease subsequent to an insider sale by a family insider compared to a nonfamily insider. *Third*, we find that family non-management insiders time their sales significantly better compared to family and nonfamily management insiders. For insider sales by family non-management insiders, we observe a negative abnormal return that is 10.1% higher compared to insider sales by family management insiders, when controlling for firm fixed effects. Our results suggest that negative effects in terms of profitability for insider sales is mitigated by the family insider's managerial involvement. For insider sales, transactions associated with significant legal and reputational risks (Kallunki et al., 2018; Dai et al., 2016), the combination of information access and reduced regulatory scrutiny may put family non-management insiders in a privileged position to exploit information asymmetries. *Fourth*, regarding information leakage, we find that abnormal short-selling volume is significantly lower shortly before insider sales by family insiders compared to insider sales by nonfamily insiders, suggesting that family insiders may be less prone to leak information to outside market participants. However, we also show that abnormal short-selling volume prior to an insider sale is higher for family non-management insiders than for family management insiders, thereby extending recent work on information leakages in family firms (Sun & Yin, 2017). Our results suggest that insider trading behavior of family insiders may be distinctly different depending on their managerial involvement in the firm.

Our study makes two main contributions. *First*, we contribute to research on informed trading and information leakages within family firms (Sun & Yin, 2017;

Anderson et al., 2012). We add to their work on trading patterns of different insider groups within family firms and on channels of information leakage. We propose a family firm-specific channel of information exchange between family insiders with and without management involvement in the family firm. By differentiating between four types of insiders who vary along their family affiliation as well as their management involvement, we provide more nuanced evidence about the potential origin of insider activities in family firms. Our work extends findings from Sun and Yin (2017) by suggesting that family non-management insiders may possess valuable, non-public information, which may be leaked to market participants, such as short-sellers. Contrary to previous literature, which suggests that non-management insiders possess only limited material, non-public information (Lakonishok & Lee, 2001; Seyhun 1986), our results imply that family non-management insiders are a distinct and important group of insiders in family firms who seem to play a critical role in detecting insider trading behavior. *Second*, we add to the understanding of insider trading heterogeneity (e.g., Kallunki et al., 2018; Kallunki et al., 2016; Hillier et al., 2015) and provide empirical evidence that family ties of insiders to the company's controlling owners can significantly affect insider trading behavior. While an insider's trading behavior can depend on various personal characteristics, such as age, gender or ethical norms (Kallunki et al., 2016; Hillier et al., 2015), our results further indicate that an insider's personal values, motives and commitment to the firm shaped by his/her family ties (Gomez-Mejia et al., 2007) are an important determinant of insider trading activity in family firms.

The rest of our study is structured as follows. In section 2, we briefly review the institutional background of insider trading. In section 3, we examine the relevant literature and develop our hypotheses for insider trading in family firms. Section 4 describes our sample and the methodology. Section 5 discusses the descriptive and regression results and section 6 presents robustness tests. Section 7 presents our analysis on information leakage in family firm, while section 8 concludes.

2 INSTITUTIONAL BACKGROUND

2.1 Insider typology in family firms

In our paper, we follow the legal definition of an insider as provided by the Securities and Exchange Commission (Section 16(a) of the Securities Exchange Act of 1934) which suggests that all directors or officers in the firm as well as shareholders with an ownership stake of at least 10% are considered insiders and thus required to disclose their trading activities to the regulatory authorities. We explore the insider purchases and sales of four distinct types of insiders in family firms, i.e., (1) family management insiders, (2) family non-management insiders, (3) nonfamily management insiders, and (4) nonfamily non-management insiders. In Figure 1, we propose a mutually exclusive typology of these four insider groups. We define a family insider as an insider who is related to the founding family of the family firm by either blood, marriage or adoption. In contrast, we define nonfamily insiders as insiders without such family ties to the founding family. Furthermore, we define management insiders as insiders who are either directors, an officer or both a director and an officer at the time of the transaction, irrespective of the insider's shareholdings in the family firm. In contrast, we define non-management insiders as insiders who own at least a 10% equity stake in the firm and who neither hold director nor officer positions at the time of the transaction and are thus not involved in the management.

[insert Figure 1 about here]

2.2 Insider trading restrictions

Regulators and corporate governance bodies may seek to ensure compliance of insider trading because illegal insider trading can result in significant legal and reputational risks for insiders as well as firms (Dai et al., 2016; Knewton & Nofsinger, 2014; Bettis et al., 2000).

While some insider trading regulations, such as Section 16(a) of the Securities Exchange Act of 1934, impose the same requirements on both management insiders and non-

management insiders, others, such as the Insider Trading and Securities Fraud Enforcement Act (ITSEFA), put more emphasis on management insiders as they hold firms liable for illegal insider trading of their employees¹. To reduce legal risks, many firms have thus designed mechanisms to discourage and restrict management insiders from exploiting information advantages (Lee et al., 2014). A common mechanism to curb illegal insider trading is to establish blackout periods during which insiders are restricted from transacting their own stock without pre-clearance (Lee et al., 2014; Jagolinzer et al., 2011). Implementing specific blackout periods is however firm-specific and the details and extent of such restrictions vary between firms (Dai et al., 2014; Jagolinzer et al., 2011).

It is plausible that firms implement such policies to restrict insider trading of management insiders rather than that of non-management insiders. Existing regulations, such as ITSEFA, specifically impose legal penalties on firms for illegal insider trading by their employees (i.e., management insiders). Firms thus may be incentivized to closely regulate insider trading of officers and executives, and to focus less on insider trading by non-management insiders. Moreover, because blackout periods are meant to limit an insider's desire to exploit information advantages, imposing such restrictions on management insiders who have immediate access to material, non-public information seems more functional than imposing these restrictions on non-management insiders who are less involved with the firm. Additional mechanisms to restrict insider trading are internal pre-clearance procedures, whereby insider trades must first be approved by the firm's compliance office (Lee et al., 2014; Bettis et al., 2000). For such policies it should again be arguably easier to ensure compliance for management insiders, compared to non-management insiders who are in no legal relationship with the firm other than being shareholders.

¹ ITSEFA was passed in 1988 and seeks to alleviate illegal insider trading by increasing the maximum penalty to \$1 million and 10 years in prison. Based on the regulation, top management can be held liable for illegal insider trading by employees.

3 LITERATURE

Literature on insider trading emphasizes that insiders should not be treated as a homogeneous group. For instance, an insider's personal characteristics, such as age and gender (Hillier et al., 2015), personal wealth (Kallunki et al., 2018), ethical misconduct (Kallunki et al., 2016), information access and exposure towards external scrutiny (Knewton & Nofsinger, 2014; Wang et al., 2012) are all factors that can affect an insider's disposition towards exploiting information asymmetries.

We expect that the heterogeneity in insider trading within family firms will vary along two dimensions that may alter the insiders' propensity to exploit information advantages: (1) the insider's family member status, that is whether he/she is member of the founding family, and (2) whether the family insider is actively involved in the management of the firm, either as a director or an officer, or just holds a substantial fraction of the shares and is otherwise not involved in the firm. Family firm boards typically consist of both members who are related to the founding family of the family firm (i.e., family insiders) and members without such family affiliation (i.e., nonfamily insiders). For instance, Anderson and Reeb (2004) find that in their sample of S&P 500 firms, family members held close to 20% of all board seats in family firms. Importantly, the presence of family directors and managers significantly alters firm performance (Amore et al., 2017; Cucculelli & Micucci, 2008; Miller et al., 2007), lending support to the notion that family insiders play a decisive role in firm management. Finally, and in contrast to their nonfamily counterparts, family insiders are not only concerned with their financial wealth but also with socioemotional returns from owning the firm, such as reputational benefits and the opportunity to uphold family control over generations (Gomez-Mejia et al., 2007; Zellweger et al., 2012). Together, these observations suggest that family insiders represent a particular class of insiders with heightened level of control and idiosyncratic goals, which should improve their access to privileged information and alter their propensity to exploit such information advantages via insider trading (Hillier et al., 2015; Knewton & Nofsinger, 2014).

3.1 Insider purchases

We conjecture that the profitability of insider purchases by family insiders is higher than that of nonfamily insiders². Because they are members of the controlling family, family insiders should be able to benefit from an informal information exchange within the family, in particular with family managers, which provides them with detailed access to various sources and types of private trusted information about the firm (Anderson et al., 2012). Second, the lengthy tenure of families in the family firm (Anderson & Reeb, 2003) may allow them to accumulate significant strategic insights which should result in higher insider trading profitability. Third, while suspicions about illegal insider purchases can occasionally lead to regulatory investigations (Cheng & Lo, 2006), family insiders may act more opportunistically than nonfamily insiders because the risk of detrimental personal consequences, such as termination of employment, is lower compared to that of nonfamily insiders (Gomez-Mejia et al., 2001). In combination with the limited legal and reputational risks associated with insider purchases (Kallunki et al., 2018; Dai et al., 2016), family insiders may be more prone to exploit information asymmetries when buying shares, compared to nonfamily insiders.

3.2 Insider sales

In contrast to insider purchases, the legal and reputational risks as well as the probability of litigations and legal costs, are significantly higher for insider sales (Kallunki et al., 2018; Dai et al., 2016; Rogers, 2008; Cheng & Lo, 2006). The risks implied in insider sales are particularly high because outside investors may realize actual losses when share prices drop whereas insider purchases only result in opportunity costs for the investors (Lee et al., 2014)³.

² In this study, the terms insider purchase and insider sale refer to open-market transactions only. Therefore, the following statements refer only to such open-market transactions and may not be applicable to other insider transactions (such as option exercises or grants).

³ Coff and Lee (2003) argue that insider purchases may be a valid mechanism for rent appropriation with limited costs to shareholders. Because insider purchases represent a positive buying signal to the market, the value of the stock increases after the insider purchase transaction is made public. The full disclosure of the insider's information on which the insider initially traded on will further increase the share price. Outside investors who owned shares prior to the insider purchase will benefit fully from the share price increase. In addition, outside investors who bought shares after the insider purchase will have lower but still positive gains, as share prices increased after the

Family insiders may be less prone than nonfamily insiders to exploit information advantages when selling firm shares. First, family insiders should refrain from selling shares based on material, non-public information because besides personal legal consequences (Anderson et al., 2012; Rogers, 2008), under the ITSFEA, firms can also be held liable for the misuse of material, non-public information of insiders if corporate governance policies fail to prevent such misuse (Dai et al., 2016; Kallunki et al., 2016; Garfinkel, 1997). For family insiders, the legal risk for insider sales is therefore not limited to personal litigation risks but extends to their own and their relatives' wealth tied to the firm, which often consists of large, undiversified equity holdings (Anderson et al., 2009). Thus, legal risks related to insider sales may not be limited to the firm-level but extend to the insider-level in the context of family firms. Second, the reputational risks tied to insider sales (Kallunki et al., 2016) should be more relevant for family insiders than for nonfamily insiders. Because the preservation of reputation is a main concern for family business owners (Villalonga et al., 2015), a loss of reputation can lead to long-lasting consequences for the family firm and its owners, whereby the misdeeds by one family insider spill over to the rest of the family and to the firm (Anderson & Reeb, 2003). The reputational risks tied to insider sales threaten the socioemotional wealth embedded in the family firm (Gomez-Mejia et al., 2007), which is of predominant concern for family insiders but not for nonfamily insiders.

While family insiders may possess material, non-public information to exploit information asymmetries when selling shares, significant legal and reputational risks associated with insider sales may result in family insiders refraining from timing their trades (Wang et al., 2012). Family insiders are often in pivotal positions (Anderson et al., 2009) which should prevent them from exploiting information asymmetries when selling firm shares as insiders in pivotal roles may be under particularly intense scrutiny by the market and regulators (Knewton & Nofsinger, 2014). Garfinkel (1997) suggests that insiders who are sensitive towards avoiding a public perception of information exploitation may deliberately time their trades to their own disadvantage.

insider purchase. Without the positive signaling, outside investors would however have benefited less and not at all, respectively.

The importance of managerial involvement amongst family insiders

A key feature of insider trading in family firms is that such behavior is not limited to trading activities within the firm management but may extend to family shareholders outside of management (i.e., family non-management insiders) as they have personal ties to family management insiders without being under the same levels of scrutiny (Anderson et al., 2012). We conjecture that insider sales by family non-management insiders will be more profitable than insider sales by family management insiders. Management insiders have better access to privileged information within the firm and possess more valuable information, compared to non-management insiders when selling firm shares (Lakonishok & Lee, 2001). However, in contrast to insider purchases, the legal and reputational risks implied in insider sales are more pronounced (Kallunki et al., 2016; Dai et al., 2016). Because of their privileged access to non-public information, management insiders tend to be intensely scrutinized by shareholders, regulators and the public, which could reduce their propensity to opportunistically time their insider sales (Dai et al., 2016; Knewton & Nofsinger, 2014; Wang et al., 2012). Family management insiders should thus refrain from opportunistically selling firm shares because they are under pronounced public scrutiny and the legal and reputational consequences can be particularly relevant for family management insiders as they often occupy pivotal management positions which are under intense scrutiny. In contrast, non-management family insiders may be subject to less scrutiny, compared to family management insiders (Anderson et al., 2012) and may be willing to extract private benefits if there is a lack of appropriate monitoring (Anderson & Reeb, 2004). Thus, while family management insiders may refrain from timing insider sales, the reduced regulatory scrutiny imposed on family non-management insiders in combination with an indirect access to insider information via their family relatives working inside the firm, should result in a more advantageous position for family non-management insiders to exploit information advantages when selling firm shares, compared to family management insiders.

4 SAMPLE & METHODOLOGY

4.1 Sample

We apply two iterative steps to compile insider trading data in U.S. family firms. First, we identify family firms which were listed in the S&P 1500 at the beginning of 2005. Second, we retrieve insider trading data linked to these previously identified family firms, which were filed during the period of 2005 until 2015 through the SEC. We collect insider trading data starting in 2005 to eliminate potential confounding effects on insider trading due to reporting policy changes as part of the Sarbanes-Oxley Act (Cao et al., 2015; Hillier et al., 2015; Knewton & Nofsinger, 2014, Jagolinzer et al., 2011).

In line with previous research on insider trading in family firms (Anderson et al., 2012), we define a family firm as a firm where the founder or the founder's descendants and heirs (either by blood or marriage) own at least a combined 5% equity stake in the family firm. Following Anderson et al. (2012), our family firm definition for the sample does not specifically require family members to be concurrently on the firm's board or in the firm's management. To determine the family founder(s) and descendants as well as their individual firm ownership stakes in the initial S&P 1500 sample, we hand-collect detailed company history data (such as founder history, firm ownership structure or board structure) for the entire S&P 1500 sample using external sources (FundingUniverse.com, Bloomberg, Financial Times as well as the company's individual websites). The data is then matched and manually enhanced with information as reported in the company's official proxy statements (form DEF-14A) to verify the initial findings as well as to calculate total family beneficial ownership (Anderson & Reeb, 2003). Family ownership is calculated by cumulating the number of shares held by each individual family member divided by the total shares outstanding. About 15% of the family firms employ a dual class share structure. In such cases, we calculate family ownership by dividing the cumulative individual ownership rights across each separate share class by total shares outstanding across all share classes. We exclude regulated firms in the financial services sector where government regulations may affect ownership structures as well as insider trading (Dai et al., 2016; Gider & Westerheide, 2016; Anderson et al., 2012).

Next, we retrieve insider trading data for open-market purchases and open-market sales during the years of 2005 until 2015 via the Wharton Research Database (WRDS). Notably, insider trading data may include various forms of transactions, such as grants, equity swaps, gifts, derivatives as well as open-market transactions. We restrict the sample to open-market purchases and sales because such transactions have been previously reported to contain more private information about the actual motives of the transaction itself (see also Cao et al., 2015; Ravina & Sapienza, 2010; Kahle, 2000 for a similar approach). To ensure data accuracy and consistency of the insider filings, we apply the following three steps: *First*, multiple purchases or multiple sales of one particular insider within a specific firm on a single transaction day are cumulated to one single day-trade (Sun & Yin, 2017; Hillier et al., 2015; Wang et al., 2012; Fidrmuc et al., 2006). As the underlying motivation of the trade as well as the implied potential informational advantage is likely to be similar for those trades, treating multiple day-transactions of a single insider as separate trades would potentially overestimate the statistical significance of abnormal returns (Cao et al., 2015; Hillier et al., 2015). *Second*, transactions with insufficient data and transactions which could not be complemented with accurate data required for the control variables are dropped from the sample⁴. *Third*, we drop insider transactions whose trade price as reported by the insiders to the regulator was not within 25% of the official closing price of that day (Knewton & Nofsinger, 2014; Lakonishok & Lee, 2001)⁵. These steps lead to a final sample of 37'012 insider transactions in family firms.

⁴ We drop 5,070 observations, which is equivalent to 9.06% of the initial sample.

⁵ Excluding transactions where the transaction day closing price is lower than USD 2.00 (Hillier et al., 2015) does not alter the significance of our main findings. Excluding transactions that involved less than 100 shares (Lakonishok & Lee, 2001; Seyhun, 1986) does also not affect the significance of our findings. When we exclude trades where the reported transaction size is higher than the total number of shares outstanding, our results also remain stable (Lakonishok & Lee, 2001). Including insider transactions whose trade price, as reported by the insiders, were not within 25% of the official closing price of that day improve the significance of our main findings for insider purchases. However, because including such cases can be problematic (Lakonishok & Lee, 2001), we apply a more conservative approach.

4.2 Methodology

We estimate linear parametric models using ordinary least squares in which the dependent variable $BHAR$ measures the buy-and-hold abnormal return following an insider trading over 120 trading days. We first calculate a baseline model (model 1). In a second model (model 2), we test our hypotheses using firm fixed effects to rule out the possibility that the results are driven by unobserved firm characteristics unrelated to family relationship effects. For example, firm-specific black-out periods (Bettis et al., 2000) and insider trading policies such as prior corporate governance approval (Jagolinzer et al., 2011) may affect an insider's propensity to exploit information asymmetries when purchasing and selling firm shares.

We start with estimating the following baseline model (model 1) for purchase and sale transactions separately, where i denotes insider, j denotes firm, and t denotes day. γ_{ijt} is a vector of insider, trade and firm observable characteristics and δ_j is a vector that includes year and industry fixed effects.

$$\begin{aligned} BHAR_{i,j,t} = & a + \beta_1 (Family\ member) + \beta_2 (Non-management\ insider) + \\ & \beta_3 (Family\ member * Non-management\ insider) + \gamma_{ijt} (Controls) + \\ & \delta_j (FE\ Year, Industry) + \varepsilon_{i,j,t} \end{aligned} \quad (1)$$

We next add firm fixed effects to the model (model 2). We define γ_{ijt} as a vector of insider and trade observable characteristics and δ_j as a vector that includes firm and year fixed effects. In model 2, we thereby do not include firm observable characteristics and industry dummies since we control for firm fixed effects.

$$\begin{aligned} BHAR_{i,j,t} = & a + \beta_1 (Family\ member) + \beta_2 (Non-management\ insider) + \\ & \beta_3 (Family\ member * Non-management\ insider) + \gamma_{ijt} (Controls) + \\ & \delta_j (FE\ Firm, Year) + \varepsilon_{i,j,t} \end{aligned} \quad (2)$$

To control for insider characteristics, we include three dummy variables (i.e., CEO, CFO and Chairman) which capture the insider's role in the firm (Hillier et al., 2015).

The trade characteristics we include as control variables are uncertainty, momentum and trade size (Kallunki et al., 2016; Reeb et al., 2014). We control for firm-level characteristics by including firm size, firm profitability and firm valuation in specification (1) (Gider & Westerheide, 2016; Hillier et al., 2015; Lakonishok & Lee, 2001). All regressions include year dummies to control for time trends in the stock market.

4.3 Variable definitions

4.3.1 *Dependent variable*

The primary dependent variable is the buy-and-hold abnormal (BHAR) stock return over a period of 120 trading days after an insider transaction. The variable is computed as the difference between the buy-and-hold stock return and the risk-adjusted expected stock return based on the CAPM model. We use a 120-trading day horizon and follow existing research on insider trading (e.g., Dai et al., 2016; Jagolinzer et al., 2011) because the short-swing rule in the SOX regulations requires insiders to surrender any profits made within less than 120 trading days. As a result, trading returns generated within less than 120 trading days cannot be monetized by insiders (Gider & Westerheide, 2016; Jenter, 2005)⁶. As we investigate exploitation of information asymmetries for personal gains, using shorter investment horizons thus may not accurately reflect the extent to which insiders engage in insider trading. To test the robustness of our results (e.g., Dai et al., 2016; Ravina & Sapienza, 2010), we compute the BHAR using the Fama-French 3-factor model (Fama & French, 1992) as well as the Carhart 4-factor model (Carhart, 1997).

4.3.2 *Independent variable*

The main independent variable “family member” estimates the impact of family membership of insiders on the profitability of insider trading. To analyze whether an insider is a family member and is thus defined as a family insider, we conduct a name-matching exercise based on hand-collected family firm history data, whereas the family surnames of the founders and their descendants or heirs as previously identified in the company’s proxy statements are matched with the surname of the individual who is reported to be

⁶ In robustness tests, we additionally calculate abnormal returns using a 1-year time horizon.

the beneficial owner of the shares transacted. Notably, U.S. listed firms are legally required to disclose the nature of any family relationship between any director or officer in the same firm in their annual proxy statements⁷. Therefore, we are able to identify not only the company’s founders but also family members in cases where family affiliation may not have been obvious (e.g., due to marriage or name changes). For example, if a family member changed his or her surname (i.e., different from that of the founding family) and remained in the management of the family firm, we would classify this person as family insider. In addition, spouses and descendants with the family name of the family insiders are equally classified as family insiders. To ensure consistency, we manually review the names of insiders with double names or unusual foreign surnames that may be spelled differently in the SEC insider trading database and the annual proxy statements. This step helps us to ensure that insider trades are not incorrectly classified as (non)family trades due to name ambiguities between the WRDS database and firm annual reports⁸.

4.3.3 *Moderator variable*

With our definition of an insider, we follow the definition provided by the U.S. Securities and Exchange Commission (Section 16(a) of the SEC Act of 1934). The SEC requires all directors, officers, and shareholders with an ownership stake of at least 10%, to disclose their insider trading activities. Correspondingly, we define the moderator variable “non-management insider” as 1 when the insider trade was reported by a 10% shareholder who was neither a director nor an officer at the time the transaction was recorded. The variable was set to 0 otherwise⁹.

⁷ The code of federal regulations (17 CFR § 229.401) requires registered firms to state the nature of any family relationship, either by blood, marriage or adoption, not more remote than the first cousin, of directors or officers.

⁸ As we assume that, within family firms, all insiders with the same surname as the founding family are family insiders, we potentially classify some nonfamily insiders as family members if their surnames match with the family name without them actually being part of the family. We test the robustness of our identification strategy by excluding transactions from our sample that were made by insiders with any of the 10 most frequently occurring family names in the United States according to the U.S. Census Bureau in 2010. These surnames were Smith, Johnson, Williams, Brown, Jones, Garcia, Miller, Davis, Rodriguez and Martinez. In untabulated results, we find that our main results remain stable.

⁹ As mentioned, we conducted a name-matching exercise to match the surnames of the founding family and its descendants and relatives with the surnames reported in the SEC insider trading database. However, for family non-management insiders who own at least 10% of firm ownership, this approach may not be entirely feasible because insider trades by non-management insiders can be reported by individuals but also by institutions (e.g., a family trust). Therefore, we manually analyzed the insider trades reported by all institutional investors and cross-

4.3.4 *Control variables*

In line with previous research on insider trading, we include a set of control variables on insider level, trade level and firm level (Gider & Westerheide, 2016; Kallunki et al., 2016; Hillier et al., 2015). To avoid a look-ahead bias for estimating abnormal stock returns, relevant trade-level control variables are lagged by one day prior to the day the transaction was executed. To mitigate the same issue for our firm-level control variables, we use quarterly firm financial information reported at the end of the quarter prior to the quarter the transaction was executed, except for firm profitability, where we use firm financial information reported at the end of the year prior to the year the transaction was executed. Insider-level control variables are not lagged as these variables are time-invariant.

To control for insider-level characteristics, we include three insider function dummies (i.e., CEO, CFO, Chairman) to control for the effects of superior and advantageous access to material, non-public information as well as to account for the level of regulatory scrutiny of insiders in pivotal management roles (Hillier et al., 2015; Knewton & Nofsinger, 2014; Wang et al., 2012)¹⁰.

To control for trade-level characteristics, we include uncertainty, proxied by stock volatility of the respective company, which was computed as the standard deviation of the daily stock returns over 250 trading days one day prior to the insider transaction since market uncertainty may result in more opportunistic insider trading behavior (Reeb et al., 2014; Coff & Lee, 2003). We include momentum, proxied by past stock returns and computed as the cumulative stock returns over 250 trading days one day prior to the insider transaction because insiders are shown to be contrarian investors (Gider & Westerheide, 2016; Jenter, 2005; Seyhun, 1986). We also account for the trade size computed as the cumulative transaction size on a given transaction day of an insider

checked the ownership structure of these institutional investors with information as disclosed in the form “Schedule 13D” which has to be filed by investors who own more than 5% of any publicly listed company in the U.S.

¹⁰ We include insider function dummies (i.e., CEO, CFO, Chairman) in our main regression models as family insiders tend to be employed in pivotal management positions in family firms (Anderson & Reeb, 2003). Since insiders in these positions generally have access to superior information, we include function dummies to ensure that our results are not simply driven by superior information access (Hillier et al., 2015; Knewton & Nofsinger, 2014) but driven by the insiders’ family ties to the firm founding families. In untabulated tests, we rerun our main regressions by excluding all function dummies as well as by excluding each function dummy separately and find that our results remain similar.

in a firm since the size of a transaction may be related to the intensity of regulatory and public scrutiny (Kallunki et al., 2016).

To control for firm-level characteristics in model 1, we include firm size computed as the natural logarithm of the total firm employees at the end of the quarter prior to the quarter of the transaction because insider trading profitability can depend on the size of the firm (Lakonishok & Lee, 2001). We also include firm profitability computed as the return on equity of the firm at the beginning of the year of the insider transaction (Gider & Westerheide, 2016; Fidrmuc et al., 2006) and relative firm valuation computed as the price-to-book value of the firm one quarter prior to the quarter of the transaction (Hillier et al., 2015).

Finally, we include year fixed effects in both models as well as industry fixed effects in model 1. Since insiders can transact multiple times within the same firm in our sample, we control for clustering of standard errors on the firm-level. To control for outlier effects, we winsorize all continuous variables at the 1st and 99th percentiles of their distributions¹¹.

5 RESULTS

5.1 Descriptive statistics

Table 1 presents the summary statistics of insider purchases (Panel A) and insider sales (Panel B). In total, we track the trading patterns of 4,222 insiders, and observe 1'312 insiders buying shares and 3'541 insiders selling shares over our sample period of 11 years¹².

On average, an insider in our sample made 3.0 share purchases and 9.4 share sales, which is similar to other studies on insider trading of U.S. listed firms (see for example Hillier et al., 2015). Panel A in Table 1 shows that of the 3,871 insider purchases included in our sample, 541 purchases (14.0% of all purchases) were made by a total of 123 family insiders. At the same time, 1,189 nonfamily insiders reported 3,330

¹¹ Please refer to Appendix 1 for variable definitions.

¹² A total of 631 unique insiders both purchased and sold shares over the sample period.

purchases (86.0% of all purchases). With 4.4 purchases on average, family insiders reported more transactions as compared to the average of 2.8 transactions reported by nonfamily insiders. Regarding the size of insider purchases, family insiders purchased 186,058 (10,000) shares on average (median), whereas nonfamily insiders purchased 223,697 (3,000) shares on average (median). Thus, the average number of shares purchased is lower for family insiders, compared to nonfamily insiders. However, both mean and median transaction value of an insider purchase are higher for family insiders, compared to nonfamily insiders.

With respect to insider sales, Panel B in Table 1 shows that there is a total of 3,541 insiders who reported 33,141 insider sales. In our sample, there are 348 family insiders who account for 11,266 insider sales, which equals 34.0% of all insider sales. At the same time, 3,193 nonfamily insiders account for 21,875 insider sales (66.0% of all insider sales). Thereby, on average, family insiders sold shares 32.4 times, compared to 6.9 times for nonfamily insiders. Regarding transaction size, family insiders sold on average (median) 179,807 (25,000) shares, compared to nonfamily insiders who sold on average (median) 39,337 (8,929) shares. Thus, the average and median number of shares sold is higher for family insiders, compared to nonfamily insiders.

[insert Table 1 about here]

Table 2 shows the summary statistics of insider trading activity of insider purchases (Panel A) and insider sales (Panel B) split by an insider's family member status and his or her involvement in the family firm management. Panel A of Table 2 reports that 91.7% of all family insider purchases were executed by family management insiders. This compares to 79.4% of all nonfamily insider purchases that were transacted by nonfamily management insiders. Interestingly, 73.0% of all family management insider purchases were reported by family management insiders who held both a director and officer position at the time of the transaction. This compares to a share of 6.4% of all nonfamily management insiders with a dual executive and director position. The average (median) transaction size is with 122,776 (10,000) purchased shares for family

management insiders significantly larger as compared to 10,021 (2,000) shares for non-family management insiders. In contrast, the average number of shares purchased is lower for family non-management insiders, compared to nonfamily non-management insiders.

Panel B in Table 2 reports that family management insiders account for 82.9% of all family insider sales in our sample, as compared to the group of nonfamily insiders, where 97.9% of all insider sales were reported by nonfamily management insiders. Panel B also reports that family management insiders, with an average (median) transaction size of 189,459 (20,000) shares, sold more shares, compared to nonfamily management insiders who sold 34,382 (8,724) shares per transaction. In contrast, family non-management insiders reported a lower average number of shares sold, compared to nonfamily non-management insiders.

[insert Table 2 about here]

5.2 Univariate analysis

Table 3 reports the univariate analysis of insider trading and family firm affiliation for insider purchases (Panel A) and sales (Panel B), respectively. We used t-tests to examine whether the differences in means are significantly different from zero. Table 3 generally corroborates our hypotheses that the profitability of insider purchases for family insiders is higher compared to nonfamily insiders and that the profitability of insider sales for family insiders is lower compared to nonfamily insiders.

Panel A in Table 3 reports that the mean six-months abnormal return for insider purchases is significantly higher for family insiders, compared to nonfamily insiders. In particular, the mean abnormal return for family insiders is 20.5%, whereas the mean abnormal return for nonfamily insiders is 7.4%, with the difference in means being statistically significant¹³. Furthermore, Panel A shows that family management insiders on average also report significantly higher abnormal returns for their insider purchases

¹³ Hillier et al. (2015) report that purchases of insiders in U.S. listed firms are associated with abnormal returns of 6.0% over a six-month investment horizon which is comparable to the mean abnormal returns for purchases of nonfamily insiders in our sample but lower than for purchases of family insiders.

(22.3%), compared to mean abnormal returns of nonfamily management insiders (7.9%). In contrast, family non-management insiders do not generate returns that are significantly different from those of nonfamily non-management insiders. Consistent with existing insider trading literature, we find that in absolute terms the abnormal returns for insider sales are lower than the abnormal returns for insider purchases (Kallunki et al., 2016; Hillier et al., 2015; Lakonishok & Lee, 2001).

Panel B in Table 3 shows that the mean six-months abnormal return for insider sales is significantly lower for family insiders, compared to nonfamily insiders¹⁴. Family insiders report a mean abnormal return for insider sales of 0.4%, whereas the mean abnormal return for insider sales of nonfamily insiders is -1.8%, with the difference in means being statistically significant. Thus, in contrast to nonfamily insiders, family insiders do not time their insider sales well since the share prices are even slightly increasing following their trades. Yet, we observe that the inferior timing ability of family insider sales is mainly driven by trades undertaken by family management insiders (1.5% versus -4.6%). In contrast, family insiders with no management involvement time their sales well as their sales are followed by negative abnormal returns. In fact, the mean abnormal return for insider sales of nonfamily non-management insiders amounts to 10.5% with the difference between family and nonfamily insiders both without management involvement being statistically significant. These results corroborate our hypothesis that family management insiders do not engage in informed insider sales while family non-management insiders may indeed exploit information asymmetries when selling shares.

Panel A in Table 3 furthermore shows that family insiders and nonfamily insiders purchase shares at comparable levels of market uncertainty, measured by market volatility¹⁵. While insiders generally have more profitable opportunities to trade in uncertain and volatile market situations (Reeb et al., 2014), our results do not show that family

¹⁴ Insiders generate abnormal returns from selling a firm share when the stock underperforms the benchmark subsequent to the sale transaction. Thereby, a negative abnormal return implies that the stock underperforms the benchmark, which is equivalent to a profit for the insider sale from the perspective of the insider because the share was sold before a subsequent price decrease. Equivalently, a positive abnormal return for an insider sale implies that the insider generated a loss because the share price increased more than expected based on capital market models after the firm stock was sold.

¹⁵ Appendix 1 provides a detailed description of how we define each variable used in our models.

insiders statistically differ from nonfamily insiders in exploiting such situations when purchasing shares. In contrast, Panel B in Table 3 shows that the level of market uncertainty is significantly lower for family insiders when they sell shares, compared to nonfamily insiders, which indicates that family insiders sell shares when markets are less volatile. Lastly, our findings in Table 3 are in line with previous work showing that insiders are contrarian investors (Kallunki et al., 2016; Hillier et al., 2015; Lakonishok & Lee, 2001). Literature suggests that insiders purchase firm shares after stock prices have declined and sell firm shares after stock prices have increased (Seyhun, 1986). Our results show that family insiders purchased shares after an average price decline of 23.3% over the previous year, whereas nonfamily insiders purchased shares after an average price decline of 4.1% over the previous year. Family insiders thus purchased their shares after significantly higher price declines, compared to nonfamily insiders. In contrast, family insiders sold their shares after a significantly lower prior price increase (15.4% increase over the previous year), compared to nonfamily insiders (26.6% increase over the previous year).

[insert Table 3 about here]

5.3 Multivariate analysis

Table 4 presents the multivariate regression results for insider purchases (Panel A) and insider sales (Panel B) estimating the impact of the family member status in family firms on the six-months abnormal return subsequent an insider trade. We deploy two types of regression models. Model 1 (reported in columns 1 and 3) includes controls for insider-level, trade-level as well firm-level determinants¹⁶, while controlling for industry and year effects fixed. Model 2 (reported in columns 2 and 4) controls for unobserved firm-level heterogeneity by including firm fixed effects to address concerns that our results may be driven by unobserved firm characteristics (Jagolinzer et al., 2011).

¹⁶ Insider-level determinants relate to the insider's function in the firm (i.e., CEO, CFO and Chairman), trade-level determinants relate to the insider transaction (i.e., uncertainty, momentum and trade size) and firm-level determinants relate to firm characteristics (i.e., size, valuation and profitability).

Regarding insider purchases, our results present some empirical evidence that abnormal returns of insider purchases made by family insiders are higher compared to nonfamily insiders. Model 1 in column 1 of Panel A shows that family insiders earn 4.0% more over a 6-month time horizon, compared to nonfamily insiders, however this effect is not statistically significant. When including firm fixed effects (column 2 of Panel A), model 2 shows that the abnormal returns of purchases for family insider are 7.2% higher, compared to nonfamily insider, being statistically significant.

Regarding insider sales, Panel B of Table 4 predicts the abnormal returns of insider trades in family firms over a six-month horizon after an insider sale. The results show that family insiders display significantly lower (i.e., less negative) abnormal returns for their sale transactions in comparison to nonfamily insiders. Columns 3 (model 1) and 4 (model 2) provide evidence that the abnormal returns of family insiders are 3.5% and 2.4% lower (less negative) compared to nonfamily insiders.

The moderating effect of non-management insider status on the profitability of family insider sales indicates that family non-management insiders exhibit significantly higher trading profitability (i.e., more negative returns following an insider sale) compared to family management insiders. A family non-management insider achieves a 17.4% (column 3) or a 10.1% (column 4) better performance when selling shares, compared to a family management insider. Family non-management insiders, who tend to be under less public and firm-internal scrutiny compared to family management insiders, are better able to benefit from information advantages.

With respect to the explanatory power of our models, the adjusted R-squared of the models in Table 4 are generally higher for insider purchases (Panel A) compared to insider sales (Panel B) which is in line with prior studies (Dai et al., 2016). In addition, the explanatory power of our models is higher when including firm fixed effects thereby excluding observable firm-level variables which is also consistent with prior research (Hillier et al., 2015).

[insert Table 4 about here]

6 ROBUSTNESS

6.1 Long-term abnormal stock returns

Following existing research on insider trading (Hillier et al., 2015; Lakonishok & Lee, 2001), in our core analysis we focused on abnormal stock returns of insiders in family firms with a buy-and-hold horizon of six months. However, because family insiders tend to invest into their firms for the long-term (Villalonga & Amit, 2006; Anderson & Reeb, 2003), family insiders may also apply a longer-term horizon with respect to insider trading.

Because long-term abnormal return estimates are generally more prone to model misspecifications compared to short-term estimates (Fama, 1998; Barber & Lyon, 1997; Kothari & Warner, 1997), we estimate the long-term abnormal stock returns using three different benchmarks for the analysis of long-term abnormal returns of insider trading in family firms. As a *first* benchmark (reference portfolio approach), we use the S&P 1500 index as a portfolio benchmark, thereby following Barber and Lyon (1997). As a *second* benchmark, (reference portfolio approach), we calculate the abnormal returns using ten size-based reference portfolios that are reconstituted once per year. Following Fildermuc et al. (2006) and Lakonishok and Lee (2001), we create size deciles based on equity market values of the S&P 1500 sample firms. Then, portfolio returns are calculated for each of the ten size portfolios, reconstituted annually, as the average of stock returns across all firms in a particular size portfolio. As a *third* benchmark (control firm return approach), we calculate the abnormal returns using matched firms based on a comparable firm characteristic (Dutta & Jog, 2009). Following Barber and Lyon (1997), we match the family firms to a control firm within the S&P 1500 sample firms based on the most similar equity market value. The market values of the family firm and the control firm are re-matched annually.

Overall, the results corroborate our main findings using a six-month investment horizon (see Table 4). Specifically, family insiders exhibit significantly lower (less negative) abnormal returns from selling shares over a 1-year time horizon compared to non-family insiders. The moderating effects of non-management insiders on abnormal returns of family insiders overall remain negative and significant, suggesting that family

non-management insiders are more prone to exploit information advantages compared to family management insiders (see Appendix 6).

6.2 Trading windows in insider trading

Extending existing literature (e.g., Gider & Westerheide et al., 2016; Kallunki et al., 2016; Hillier et al., 2015), we explore trading patterns of management as well as non-management insiders. However, as these two groups differ with respect to their managerial involvement in the firm next to their access to privileged information, they may be bound by different insider trading restrictions that could potentially distort our results as outlined in Chapter 2.2. To examine whether differences in trading windows between management insiders and non-management insiders affect our main results, we run two additional models. First, using our baseline model with firm fixed effects, we include month fixed effects instead of year fixed effects. Second, we add both month as well as year fixed effects to the model¹⁷.

We find that our results overall remain stable when including month fixed effects as well as month and year fixed effects both for insider purchases as well as insider sales. Thus, potential differences in permitted trading windows that could be a result of blackout periods or other regulations do not seem to affect our findings (see Appendix 7).

6.3 Robustness of the dependent variable

We test the robustness of the dependent variable using three different definitions of the return benchmark to calculate the abnormal returns. In our baseline regressions, we defined the BHAR as the delta between the stock return and the expected return based on the CAPM of the respective stock following an insider transaction. In Table 8, we additionally calculate the BHAR using the Fama-French 3-factor model (Fama & French, 1992) as well as the Carhart 4-factor model (Carhart, 1997). Our results are overall stable across both alternative benchmarks (see Appendix 8).

¹⁷ For the distribution of insider trades by month, see Appendix 4.

7 INFORMATION LEAKAGE IN FAMILY FIRMS

According to U.S. regulations and interpretation of Securities Exchange Act Section 10(b) and the associated SEC Rule 10b-5, insider trading violations also extends to the “tipping” of material, non-public information, which refers to disclosing such information directly or indirectly to others¹⁸. Thus, the issue of insider trading is not necessarily constrained to exploiting such information for personal benefits. Instead, access to privileged information may also facilitate information leakage into the market (Anderson et al., 2012). Both Sun and Yin (2017) and Anderson et al. (2012) show that information leakage is particularly pronounced in family firms and therefore appears as a salient issue to analyze in our study. We explore whether there are differences in information leakage by examining our four types of insiders (see Figure 1 for clarification).

While Sun & Yin (2017) provide evidence that family insiders are less prone to leak private information, compared to nonfamily insiders, in our analysis, we are particularly interested in non-management insiders, a group of insiders which, in opposite to management insiders, has received limited attention in literature but is highly relevant in the context of family firms. Non-management insiders are often considered less informative than management insiders because they are not actively involved in a firm’s decision-making process (Lakonishok & Lee, 2001). Yet, given their family ties, family non-management insiders may have access to material, non-public information, which is otherwise not available to nonfamily shareholders. At the same time, because they are not part of management, insider trading activity from family non-management insiders is under lower regulatory and market scrutiny (Anderson et al., 2012). This offers a potential channel to leak material, non-public information to the market with limited regulatory oversight.

We analyze short-selling activity around insider sales to assess the potential of information leakage in family firms. Short-sellers are often considered well-informed traders (Boehmer et al., 2008; Desai et al., 2002). At the same time, research shows that short-selling activity is particularly high around insider sales, indicating that non-public

¹⁸ See for example *Dirks v. Securities and Exchange Commission* (1983).

information contained in the insider sale may be leaked into the market, allowing for informed trading by short-sellers (Sun & Yin, 2017; Chakrabarty & Shkilko, 2013). By analyzing potential information leakage around insider sales, we can draw on a large sample of insider transactions in family firms, where we have already identified and classified each insider by family affiliation and managerial involvement in the first part of our study. This should allow us to depict a more nuanced picture of potential information leakage in family firms. With this section, we thus complement our initial analysis on information exploitation in insider trading towards information leakage in family firms.

7.1 Data & methodology

To analyze potential information leakage in family firms, we use SEC Regulation SHO short-sale data for NYSE-listed securities (Anderson et al., 2012; Engelberg et al., 2012). Through Regulation SHO, transaction-level short-sale data was made available to the public for a limited time and covers the period beginning of January 2005 throughout end of June 2007¹⁹. We obtain SEC Regulation SHO short-sale from WRDS and aggregate the transaction-level short-sale data to the daily family firm-level. Our sample starts on the first trade day in February 2005 and ends at the last trade day in May 2007. We omit the first and last month of the original sample period because we measure short-selling activity around insider sales which requires short-selling information to be available both before and after the actual insider sale event²⁰. To analyze abnormal short-selling activity around insider sales, we apply an event-study approach and define the event window $[-10,10]$ as the period from 10 trade days prior to the insider sale until 10 trade days after the insider sale event (Sun & Yin, 2017; Chakrabarty & Shkilko, 2013; Khan & Lu, 2013). We define the insider sale day as the event day $[0]$. For family firms that report insider sales during our sample period and that have at least one short-sale transaction reported in the sample, we match the daily short sales data for a 21-trade day

¹⁹ The Regulation SHO only requires entities to report short-sales volumes but it does not require firms to disclose the identity of each short-seller (Anderson et al., 2012; Engelberg et al., 2012).

²⁰ Chakrabarty and Shkilko (2013) argue that some entities may have not been in full compliance with the Regulation SHO standards up until May 2005. In robustness tests, we exclude all insider sales and corresponding short sales which occurred during the first four months of our sample period and find that our main results remain stable.

period around each insider sale. For all trade days within each event window, we obtain stock market and firm-level accounting data from CRSP. Through this approach, we obtain a final sample which comprises 127 family firms, 6,051 insider sale events and 126,978 trade-day observations²¹.

We apply the event study methodology to measure abnormal short-selling activity around insider sales in family firms as follows. We define abnormal short-selling volume as the difference between the average daily short-selling volume 20 trade days prior to the event window and the daily short-selling volume on each day within the event window (Sun & Yin, 2017). We denote i as insider event, j as firm, and t denotes day. $ss_{i,j,t}$ denotes the short-selling volume of an insider event i in a firm j on trade day t . The average daily short-selling volume $avg.ss_{i,j}$ is defined as the mean daily short-selling volume between trade day 30 to trade day 11 prior to the event window $[-30,-11]$, which is

$$avg.ss_{i,j} = \frac{1}{20} \sum_{t=-30}^{t=-11} ss_{i,j,t} \quad (3)$$

The abnormal short-selling volume per day within the event window $[-10,10]$, $ab.ss_{i,j,t}$, is defined as the difference between the daily short-selling volume within the event window minus the average daily short-selling volume prior to the event window, which is

$$ab.ss_{i,j,t} = (ss_{i,j,t} - avg.ss_{i,j}) \quad (4)$$

We then calculate abnormal short-selling volume as a percentage of the total number of shares outstanding, $abn.ss_{i,j,t}$, which is

$$abn.ss_{i,j,t} = \left[\frac{ab.ss_{i,j,t}}{shares\ outstanding_{i,j,t}} \right] \times 100 \quad (5)$$

²¹ To ensure robustness of our results, in post-hoc tests, we exclude firms which trade at a share price below USD 5.00 at the time of the insider sale to address potential differences in margin requirements on short positions for these stocks (Chakrabarty & Shkilkov, 2013; Christophe et al., 2010). We find that our main results remain stable.

To reduce the influence of confounding factors in our multivariate analysis on abnormal short-selling activity around insider trades, we include a set of control variables that may affect insider trading as well as short-selling activity. The model also includes industry and year fixed effects. We estimate the following regression model, whereas i denotes the insider event, j the firm, and t denotes the day within the event window.

$$\begin{aligned} abn.ss_{i,j,t} = & \alpha + \beta_1(Insider_{i,j}) + \beta_2(Family\ member_{i,j}) + \beta_3(Insider_{i,j} * Family\ member_{i,j}) + \\ & \beta_4(Insider_{i,j} * Family\ member_{i,j} * Non-management_{i,j}) + \\ & \gamma_{ijt}(Controls) + \delta_j(FE\ Year, Industry) + \varepsilon_{i,j,t} \end{aligned} \quad (6)$$

In a second model, we include firm fixed effects and omit firm observable characteristics as well as industry fixed effects.

$$\begin{aligned} abn.ss_{i,j,t} = & \alpha + \beta_1(Insider_{i,j}) + \beta_2(Family\ member_{i,j}) + \beta_3(Insider_{i,j} * Family\ member_{i,j}) + \\ & \beta_4(Insider_{i,j} * Family\ member_{i,j} * Non-management_{i,j}) + \\ & \gamma_{ijt}(Controls) + \delta_j(FE\ Firm, Year) + \varepsilon_{i,j,t} \end{aligned} \quad (7)$$

In our two models, we use $abn.ss_{i,j,t}$ as our main dependent variable. $Insider_{i,j}$ is a dummy variable which captures whether the short sale was initiated shortly prior to the insider sale event. We define $Insider[-5,0]$ as 1 if the short sale was initiated within 5 days prior to and including the insider sale day, and 0 otherwise. We define $Insider[-3,0]$ as 1 if the short sale was initiated within 3 days prior to and including the insider sale day, and 0 otherwise. We define $Insider[-1,0]$ as 1 if the short sale was initiated within 1 day prior to and including the insider sale day, and 0 otherwise. $Family\ member$ is a dummy variable which equals 1 if the insider is part of the founding family by either blood, marriage or adoption at the time of the transaction, and 0 otherwise. Following previous research (Sun & Yin, 2017; Chakrabarty & Shkilko, 2013; Khan & Lu, 2013), we include several control variables in our models. For the first model (equation (6)) we include turnover, bid-ask spread, $Short_{(t-5;t-1)}$, $CAR_{(t-5;t-1)}$, AR_t , firm size and firm

valuation²². For our second model which controls for firm fixed effects (equation (7)), we exclude firm size and firm valuation as well as industry fixed effects. We use heteroskedasticity-consistent standard errors clustered at the insider sale event level in all our models.

7.2 Results

Table 5 presents the summary statistics for insider sales and short sales. The mean (median) insider sale transaction size for our sample is 78,751 (15,000) shares which is similar in size to our results in the first analysis of our paper. Also consistent with our previous findings, the mean and median insider sale transaction size is larger for family insiders, compared to nonfamily insiders. On average, insiders sold 0.07 percent of total shares outstanding per transaction. Regarding short sale volume, the mean short sale volume during the event window is 275,915 shares, which accounts for 0.182 percent of shares outstanding. On the event day, the absolute mean short sale volume is 305,890 shares, accounting for 0.204 percent of shares outstanding. Our descriptive findings in Table 5 are similar in magnitude compared to previous studies that use the same dataset (Chakrabarty & Shkilko, 2013; Khan & Lu, 2013; Blau & Wade, 2012).

[insert Table 5 about here]

Panel A in Table 6 reports the results for the daily abnormal short sales in the [-10, 10] event window around insider sales for insiders, split by managerial involvement (management insider vs non-management insider) and family affiliation (family vs non-family). We document abnormal short sale volume which is significantly different from zero for both family as well as nonfamily management insiders up to ten days prior to the insider sale, which is longer than previous studies have reported (Khan & Lu, 2013). However, we do not find a comparable pattern for non-management insiders, neither for family nor nonfamily non-management insiders. Overall, we observe lower magnitudes of abnormal short sale volume around insider trades by non-management insiders during

²² See Appendix 1 for a detailed description of each variable.

the event window $[-10,10]$, compared to insider trades by management insiders. Interestingly, on the day of the insider sale $[0]$, all insider groups exhibit abnormal short sale volumes which are positive and significantly different from zero. Panel B reports the daily abnormal short sale volume for the three $[-5,0]$, $[-3,0]$ and $[-1,0]$ trading windows. Our results show that abnormal short sales in all trading windows are positive and significantly different from zero for insider sales by family management insiders as well as nonfamily management insiders. The abnormal short sale volume in these trading windows appears to be lower for family management insiders, compared to nonfamily management insiders. For example, during the $[-5,0]$ trading window, daily abnormal short sales around insider sales made by family management insiders are 0.0197%, compared to 0.0434% for insider sales made by nonfamily management insiders. We also find that abnormal short sale volume in these trading windows for insider sales by family non-management insiders are positive, and significantly different from zero across all three trading windows. On a daily average, insider sales by family non-management insiders exhibit abnormal short sale volume of 0.0043%, during the $[-5,0]$ trading window. In contrast, we do not find similar results for nonfamily non-management insiders.

[insert Table 6 about here]

We further test the significance of abnormal short sales around insider sales in family firms in a multivariate setting. Because we are interested how abnormal short sale volumes differ shortly prior to insider sales, in comparison to the entire event window, we include three-way interaction effects in our regression models for three trading windows, i.e., Insider $[-5,0]$, Insider $[-3,0]$ and Insider $[-1,0]$. Table 7 reports our main regression results. *First*, all three trading windows, (represented by variables insider $[5,0]$, insider $[-3,0]$, insider $[-1,0]$) exhibit significantly higher abnormal short sale volumes, compared to other days during the event window, suggesting informed trading and information leakage around insider sales (Sun & Yin, 2017; Chakrabarty & Shkilko, 2013; Khan & Lu, 2013). *Second*, our results further show that family insiders experience lower abnormal short sales in the trade days prior to their insider sales, compared

to nonfamily insiders, consistent with Sun and Yin (2017). During the three and one days prior to and including the insider sale day (Insider[-3,0], Insider[-1,0]), family insiders experience 0.0098% and 0.0093% lower abnormal short sales on a daily average, compared to insider sales by nonfamily insiders²³. Our results suggest that family affiliation appears to be an important determinant of abnormal short-selling activity around insider sales in family firms. Importantly, insider sales by family non-management insiders, i.e., family insiders who are not involved in management of the family firm, exhibit significantly higher abnormal short sales volumes compared to insider sales by family management insiders. During the [-5,0] trading window, daily abnormal short sales around insider sales made by family non-management insiders are 0.0288% higher, compared to insider sales by family management insiders. For the [-3,0] and [-1,0] trading windows, daily abnormal short-selling volume is 0.0327% and 0.0216% higher around insider sales by family non-management insiders, compared to insider sales by family management insiders.

[insert Table 7 about here]

To facilitate interpretation of our results, in additional tests, we also classify the sample into two groups, i.e., management insiders and non-management insiders and run two separate regressions based on these subsamples²⁴. We observe a consistent pattern with respect to management insiders, where the abnormal short sales volume around insider trades by family management insiders is significantly lower, compared to insider trades by nonfamily management insiders (Sun & Yin, 2017). However, we observe an inverse effect of family affiliation on non-management insiders. We find that insider sales by family non-management insiders exhibit significantly higher abnormal short sale volumes prior to the insider sale, compared to insider sales by nonfamily non-management insiders. During the three trading windows [-5,0], [-3,0] and [-1,0], abnormal short sales prior to insider sales by family non-management insiders are 0.0199%,

²³ See also Appendix 10.

²⁴ See Appendix 11.

0.0237% and 0.0139% higher, compared to insider sales by nonfamily non-management insiders, respectively.

8 CONCLUSION

We examine insider trading within family firms and distinguish between insiders who are personally related to the founding family in family firms are more prone to exploit their information advantages compared to insiders who are unrelated to the founding family. We find evidence that the profitability of insider purchases is higher for family insiders, compared to nonfamily insiders. In contrast, the profitability of insider sales, transactions which are associated with significant legal and reputational costs (Kallunki et al., 2018; Dai et al., 2016; Rogers, 2008) is lower for family insiders, compared to nonfamily insiders. Yet, we find that this effect is mitigated by the extent to which a family insider is actively involved in managing the company, as top management team or board member. Our results suggest that family non-management insiders may take advantage of their personal relationship with family management insiders and the controlling family to exploit information advantages while not being exposed to the same level of regulatory scrutiny as family management insiders. We also investigate a second form of insider trading, i.e., information leakage (Anderson et al., 2012) and find that abnormal short sales volumes prior to insider sales by family insiders is lower compared to insider sales of nonfamily insiders, similar to Sun and Yin (2017). However, the effect is moderated by a family insider's managerial involvement, such that abnormal short sales prior to insider sales by family non-management insiders is higher, compared to insider sales by family management insiders.

Overall, our results suggest that family ties are an important determinant of insider trading behavior and that, despite not being involved in management, family non-management insiders may possess material, non-public information which they can exploit for personal benefit or be leaked to outside market participants. We contribute to literature on insider trading heterogeneity (Kallunki et al., 2018; Kallunki et al., 2016; Hillier et al., 2015) to show how personal ties to the firm affect an insider's disposition to exploit insider information advantages. We also extend research on informed trading and

information leakages in family firms (Sun and Yin, 2017; Anderson et al., 2012) by differentiating between different insider types within family firms.

References

- Agrawal, A. & Cooper, T. (2015). Insider trading before accounting scandals. *Journal of Corporate Finance* **34**: 169–190.
- Agrawal, A. & Nasser, T. (2012). Insider trading in takeover targets. *Journal of Corporate Finance* **18**: 598–625.
- Amore, M.D., Miller, D., Le Breton-Miller, I. & Corbetta, G. (2017). For love and money: Marital leadership in family firms. *Journal of Corporate Finance* **46**: 461–476.
- Anderson, R.C., Duru, A. & Reeb, D.M. (2009). Founders, Heirs, and Corporate Opacity. *Journal of Financial Economics* **92**: 205–222.
- Anderson, R.C. & Reeb, D.M. (2003). Founding-Family ownership and Firm Performance: Evidence from the S&P 500. *The Journal of Finance* **63**: 1301–1328.
- Anderson, R.C. & Reeb, D.M. (2004). Board composition: balancing family influence in S&P 500 firms. *Administrative Science Quarterly* **49**(2): 209–237.
- Anderson, R.C., Reeb, D.M. & Zhao, W. (2012). Family-Controlled Firms and Informed Trading: Evidence from Short Sales. *The Journal of Finance* **67**(1): 351–385.
- Barber, B.M. & Lyon, J.D. (1997). Detecting long-run abnormal stock returns: The empirical power and specification of test-statistics. *Journal of Financial Economics* **43**: 341–372.
- Bettis, C., Coles, J. & Lemmon, M. (2000). Corporate policies restricting trades by insiders. *Journal of Financial Economics* **57**(2): 191–220.
- Boehmer, E., Jones, C. & Zhang, X. (2008). Which shorts are informed? *The Journal of Finance* **63**(2): 491–527.
- Blau, B. & Wade, C. (2012). Informed or speculative: short-selling analyst recommendations. *Journal of Banking and Finance* **36**: 14–25.
- Cao, Y., Dhaliwal, D., Li, Z. & Yang, Y.G. (2015). Are All Independent Directors Equally Informed? Evidence Based on Their Trading Returns and Social Networks. *Management Science* **61**(4): 795–813.
- Carhart, M. (1997). On Persistence in Mutual Fund Performance. *The Journal of Finance* **52**: 57–82.
- Chakrabarty, B. & Shkilko, A. (2013). Information transfers and learning in financial markets: Evidence from short-selling around insider sales. *Journal of Banking & Finance* **37**(5): 1560–1572.
- Chen, S., Chen, X. & Cheng, Q. (2008). Do family firms provide more or less voluntary disclosure? *Journal of Accounting Research* **46**(3): 499–536.
- Cheng, Q. & Lo, K. (2006). Insider trading and voluntary disclosures. *Journal of Accounting Research* **44**: 815–848.

- Christophe, S.E., Ferri, M.G. & Hsieh, J. (2010). Informed trading before analyst downgrades: evidence from short sellers. *Journal of Financial Economics* **95**(1): 85–106.
- Coff, R.W. & Lee, P.M. (2003). Insider trading as a vehicle to appropriate rent from R&D. *Strategic Management Journal* **24**: 183–190.
- Cucculelli, M. & Micucci, G. (2008). Family succession and firm performance: Evidence from Italian family firms. *Journal of Corporate Finance* **14**: 17–31.
- Dai, L., Fu, R., Kang, J.K. & Lee, I. (2016). Corporate governance and the profitability of insider trading. *Journal of Corporate Finance* **40**: 235–253.
- Desai, H., Ramesh, K., Thiagarajan, S.R. & Balachandra, B. (2002). An investigation of the informational role of short interest in the NASDAQ market. *The Journal of Finance* **57**(5): 2263–2287.
- Dutta, J. & Jog, V. (2009). The long-term performance of acquiring firms: A re-examination of an anomaly. *Journal of Banking & Finance* **33**(8): 1400–1412.
- Engelberg, J.E., Reed, A.V. & Ringgenberg, M.C. (2012). How are shorts informed? *Journal of Financial Economics* **105**(22): 260–278.
- Fama, E.F. (1998). Market efficiency, long-term returns, and behavioral finance. *Journal of Financial Economics* **49**: 283–306.
- Fama, E.F. & French, K. (1992). The cross-section of expected stock returns. *The Journal of Finance* **47**: 427–465.
- Fidrmuc, J.P., Goergen, M. & Renneboog, L. (2006). Insider trading, news releases, and ownership concentration. *The Journal of Finance* **61**(6): 2931–2973.
- Garfinkel, J. (1997). New evidence on the effects of federal regulation on insider trading: The Insider Trading and Securities Fraud Enforcement Act (ITSFEA). *Journal of Corporate Finance* **3**: 89–111.
- Gider, J. & Westerheide, C. (2016). Relative idiosyncratic volatility and the timing of corporate insider trading. *Journal of Corporate Finance* **39**: 312–334.
- Gomez-Mejia, L., Haynes, K., Nunez, M., Jacobson, K. & Moyano, J. (2007). Socio-emotional wealth and business risk in family-controlled firms: evidence from Spanish olive oil mills. *Administrative Science Quarterly* **52**: 106–137.
- Gomez-Mejia, L.R., Nunez-Nickel, M., & Gutierrez, I. (2001). The role of family ties in agency contracts. *The Academy of Management Journal* **44**(1): 81–95.
- Hillier, D., Korczak, A. & Korczak, P. (2015). The impact of personal attributes on corporate insider trading *Journal of Corporate Finance* **30**: 150–167.
- Jagolinzer, A.D., Larcker, D.F. & Taylor, D.J. (2011). Corporate governance and the information content of insider trades. *Journal of Accounting Research* **49**: 1249–1274.

- Jeng, L.A., Metrick, A. & Zeckhauser, R. (2003). Estimating the returns to insider trading: a performance-evaluation perspective. *Review of Economics and Statistics* **85**: 453–471.
- Jenter, D. (2005). Market timing and managerial portfolio decisions. *The Journal of Finance* **60**: 1903–1949.
- Kahle, K. (2000). Insider trading and the long-run performance of new security issues. *Journal of Corporate Finance* **6**: 25–53.
- Kallunki, J., Kallunki, J.P., Nilsson, H. & Puhakka, M. (2018). Do an insider's wealth and income matter in the decision to engage in insider trading? *Journal of Financial Economics* **130**(1): 135–165.
- Kallunki, J.P., Mikkonen, J., Nilsson, H. & Setterberg, H. (2016). Tax noncompliance and insider trading. *Journal of Corporate Finance* **36**: 157–173.
- Khan, M. & Lu, H. (2013). Do short sellers front-run insider sales? *Accounting Review* **88**(5): 1743–1768.
- Knewtson, H.S. & Nofsinger, J.R. (2014). Why are CFO insider trades more informative? *Managerial Finance* **40**(2): 157–175.
- Kothari, S.P. & Warner, J.B. (1997). Measuring long-horizon security price performance. *Journal of Financial Economics* **43**: 301–339.
- Lakonishok, J. & Lee, I. (2001). Are insider trades informative? *Review of Financial Studies* **14**: 79–111.
- Lee, I. (1997). Do firms knowingly sell overvalued equity? *The Journal of Finance* **52**: 1439–1466.
- Lee, I., Lemmon, M., Li, Y. & Sequeira, J. (2014). Do voluntary corporate restrictions on insider trading eliminate informed insider trading? *Journal of Corporate Finance* **29**: 158–178.
- Miller, D., Le Breton-Miller, I., Lester, R.H. & Cannella, A.A. Jr (2007). Are family firms really superior performers? *Journal of Corporate Finance* **13**: 829–858.
- Ravina, E. & Sapienza, P. (2010). What do independent directors know? Evidence from their trading. *Review of Financial Studies* **23**: 962–1003.
- Reeb, D.M., Zhang, Y. & Zhao, W. (2014). Insider Trading in Supervised Industries. *The Journal of Law & Economics* **57**: 529–559.
- Seyhun, N. (1986). Insiders' profits, costs of trading, and market efficiency. *Journal of Financial Economics* **16**: 189–212.
- Seyhun, N. (1992). The effectiveness of the insider-trading sanctions. *Journal of Law and Economics* **35**: 149–182.
- Sun, H. & Yin, S. (2017). Information leakage in family firms: Evidence from short around insider sales. *Journal of Corporate Finance* **47**: 72–87.
- Villalonga, B. & Amit, R. (2006). How do family ownership, control, and management affect firm value? *Journal of Financial Economics* **80**: 385–417.

- Villalonga, B., Amit, R., Trujillo, M.A., & Guzman, A. (2015). Governance of Family Firms. *Annual Review of Financial Economics* **7**: 635–654.
- Wang, W., Shin, Y. & Francis, B.B. (2012). Are CFOs' trades more informative than CEOs' trades? *The Journal of Financial and Quantitative Analysis* **47**: 743–762.
- Zellweger, T.M., Kellermanns, F.W., Chrisman, J.J. & Chua, J.H. (2012). Family control and family firm valuation by family CEOs: The importance of intentions for transgenerational control. *Organization Science* **23(3)**: 851–868.

Figure 1: Insider typology in family firms

This figure presents the insider typology in family firms for our study. The insider typology is mutually exclusive, i.e., there are no overlaps allowed in the four quadrants for the purpose of this study. The term “Family insider” refers to an insider who is related to the founding family of the family firm by either blood, marriage or adoption not more remote than the first cousin. The term “Nonfamily insider” refers to an insider without such family ties to the founding family. The term “Management insider” refers to an insider who is either a director, an officer or both a director and an officer at the time of the transaction, irrespective of the insider’s shareholdings in the family firm. The term “Non-management insider” refers to an insider who is a major shareholder in accordance with the respective SEC insider trading regulations, but holds neither a director nor an officer position at the time of the transaction, thereby reportedly has no active involvement in the family firm’s management.

		Family member status	
		Family insider	Nonfamily insider
Managerial involvement	Management insider	(1) Family management insider	(3) Nonfamily management insider
	Non-management insider	(2) Family non-management insider	(4) Nonfamily non-management insider

Table 1: Summary statistics of insider trading activity by family member status

This table reports the summary statistics of insider purchases (Panel A) and sales (Panel B) made by family and nonfamily insiders. The sample consists of all insider trades reported by all directors, officers and shareholders with an ownership stake of at least 10% in S&P 1500 family firms as of 2005 for the transaction period from 2005 until 2015. We track a total of 4'222 individual insiders over this time period. The variable "family insider" relates to insiders who are part of the founding family by either blood, marriage or adoption at the time of the transaction and is equal to a "nonfamily insider", otherwise. A family insider is considered being part of the founding family if his surname is equal to 1) the surname of the founding family, or equal to 2) the surname of the descendants and/or heirs of the founding family.

	<u>No. of insiders</u>		<u>No. of insider trades</u>			<u>No. of shares transacted</u>			<u>Value (USD) of shares transacted</u>		
	#	%	#	%	Avg*.	Mean	StDev.	Median	Mean	StDev.	Median
<i>Panel A: Insider purchases</i>											
Family insider	123	9.4%	541	14.0%	4.4	186,058	1,520,535	10,000	2,970,040	17,400,000	105,650
Nonfamily insider	1,189	90.6%	3,330	86.0%	2.8	223,697	5,944,523	3,000	2,670,105	38,500,000	50,460
	<u>1,312</u>	<u>100.0%</u>	<u>3,871</u>	<u>100.0%</u>	<u>3.0</u>						
<i>Panel B: Insider sales</i>											
Family insider	348	9.8%	11,266	34.0%	32.4	179,807	594,887	25,000	4,705,664	17,000,000	537,268
Nonfamily insider	3,193	90.2%	21,875	66.0%	6.9	39,337	322,102	8,929	1,276,886	10,100,000	290,183
	<u>3,541</u>	<u>100.0%</u>	<u>33,141</u>	<u>100.0%</u>	<u>9.4</u>						

Notes: Avg.* refers to the number of insider trades per insider

Table 2: Summary statistics of insider trading activity by insider function

This table reports summary statistics on insiders' trading activity depending on their function in the family firm at the time the insider transaction was reported to the SEC. Panel A (Panel B) refers to insider purchases (sales) split by the function of the insider. The function typology is mutually exclusive. Hence, the type "Director" ("Officer") includes insiders who are only directors (officers) and thus excludes insiders who are simultaneously directors and officers in the same firm at the time of the transaction. The function "Director & Officer" includes insiders who are both directors and officers at the time of the transaction. The function "Non-management insider" refers to insiders who own at least 10% of the firm but are neither directors nor officers. The number of insiders does not necessarily have to reconcile with the number of insiders in Table 1 since insiders may change their functions over the course of the observation period.

	Family insider						Nonfamily insider					
	No. of insiders	No. of insider trades		Avg. No. of shares transacted			No. of insiders	No. of insider trades		Avg. No. of shares transacted		
		#	%	Mean	StDev.	Median		#	%	Mean	StDev.	Median
Panel A: Insider purchases												
Management insider	104	496	91.7%	122,776	570,651	10,000	1,152	2,644	79.4%	10,021	65,835	2,000
Director (only)	37	99	18.3%	132,297	597,323	10,000	669	1,645	49.4%	11,353	78,292	2,000
Officer (only)	5	2	0.4%	12,950	17,041	12,950	384	786	23.6%	5,035	17,354	2,000
Director & Officer	62	395	73.0%	120,946	565,937	10,000	99	213	6.4%	18,132	72,210	5,000
Chairman (only)	17	51		112,709	181,238	60,000	-	-		-	-	-
CEO (only)	13	216		30,080	62,701	5,000	64	138		11,057	17,358	5,000
Chairman & CEO	21	111		310,579	1,034,917	15,238	14	41		15,870	30,826	5,000
Non-management insider	23	45	8.3%	883,567	4,916,165	80,000	86	686	20.6%	1,047,253	13,100,000	30,000
Sum	127	541	100.0%				1,238	3,330	100.0%			
Panel B: Insider sales												
Management insider	343	9,334	82.9%	189,459	606,269	20,000	3,574	21,417	97.9%	34,382	278,285	8,724
Director (only)	138	4,517	40.1%	256,770	773,853	19,200	1,009	4,916	22.5%	29,798	269,730	6,369
Officer (only)	32	402	3.6%	17,483	48,227	6,750	2,282	13,941	63.7%	23,904	73,035	8,148
Director (only)	173	4,415	39.2%	136,251	392,576	25,000	283	2,560	11.7%	100,247	688,722	20,000
Chairman (only)	52	1,275		185,696	596,485	25,000	18	130		127,187	215,635	33,590
CEO (only)	53	1,072		233,230	392,997	25,807	132	1,142		113,249	927,946	16,867
Chairman & CEO	48	1,281		43,061	113,035	20,000	45	351		66,504	220,881	25,000
Non-management insider	98	1,932	17.1%	133,180	534,202	50,103	79	458	2.1%	271,036	1,132,176	27,759
Sum	441	11,266	100.0%				3,653	21,875	100.0%			

Table 3: Univariate analysis of insider trading and family member status

This table shows the univariate analysis of insider trading and family affiliation for insiders in family firms. BHAR represents the excess return between a buy-and-hold return of a stock of a family firm and the 1-factor expected returns (CAPM) of the respective stock over the period of 120 trading days. All continuous variables are win-sorized at the 1st and 99th percentile. The significance of the means for all insiders (column 1), family insiders (column 3) and nonfamily insiders (column 5) were tested in a single sample t-test against the mean of zero. The differences in mean between family insiders (column 3) and nonfamily insiders (column 5) were tested using a two-sample t-test. The symbols *, ** and *** indicate two-tail significance at the 5%, 1% and 0.1% levels, respectively.

			Family member status				
	All insiders		Family insiders		Nonfamily insiders		Test for differences
	Mean (1)	Median (2)	Mean (3)	Median (4)	Mean (5)	Median (6)	Mean (5)-(3)
Panel A: Insider purchases							
BHAR	0.092***	0.028	0.205***	0.054	0.074***	0.024	-0.1307***
BHAR - Management insiders	0.102***	0.026	0.223***	0.060	0.079***	0.021	-0.1443***
BHAR - Non-management insiders	0.053***	0.037	0.004**	-0.032	0.057***	0.040	0.0535
CEO position	0.141***	0.000	0.604***	1.000	0.065***	0.000	-0.5392***
CFO position	0.064***	0.000	0.004	0.000	0.073***	0.000	0.0696***
Chairman position	0.064***	0.000	0.299***	0.000	0.026***	0.000	-0.2733***
Uncertainty	0.260***	0.164	0.261***	0.152	0.263***	0.167	0.0026
Momentum	-0.066***	-0.120	-0.233***	-0.272	-0.041***	-0.089	0.1914***
Trade size	42'925***	4'000	81'669***	10'000	33'455***	3'000	-48'214***
Firm size (ln)	8.375***	8.183	8.303***	8.189	8.375***	8.180	0.0728
Firm valuation	2.547***	2.050	2.358***	2.280	2.568***	2.040	0.2095
Firm profitability	6.717***	9.690	7.023***	9.690	6.734***	9.690	-0.2894
N	3,871		541		3,330		
Panel B: Insider sales							
BHAR - All insiders	-0.011***	-0.016	0.004*	0.001	-0.018***	-0.027	-0.0228***
BHAR - Management insiders	-0.010***	-0.015	0.015***	0.009	-0.021***	-0.027	-0.0359***
BHAR - Non-management insiders	-0.017**	-0.032	-0.046***	-0.041	0.105***	0.051	0.1508***
CEO position	0.123***	0.000	0.213***	0.000	0.077***	0.000	0.0767***
CFO position	0.054***	0.000	0.004***	0.000	0.080***	0.000	0.0757***
Chairman position	0.093***	0.000	0.230***	0.000	0.023***	0.000	-0.2074***
Uncertainty	0.264***	0.182	0.221***	0.167	0.289***	0.190	0.0681***
Momentum	0.228***	0.175	0.154***	0.132	0.266***	0.201	0.1122***
Trade size	69'236***	10'336	132'267***	25'000	31'122***	8'929	-101'144***
Firm size (ln)	9.041***	9.020	9.074***	9.119	9.020***	8.987	-0.0537**
Firm valuation	2.951***	2.460	2.671***	2.360	3.054***	2.500	0.3833***
Firm profitability	13.533***	13.130	11.229***	12.030	14.751***	13.610	3.5221***
N	33,141		11,266		21,875		

Table 4: Determinants of abnormal stock returns in family firms

This table shows the regression analysis for estimating the buy-and-hold abnormal returns (BHAR) for insider trades in family firms. The dependent variable BHAR represent the excess return between a buy-and-hold return of a stock of a family firm and the 1-factor expected returns (CAPM) of the respective stock over the period of 120 trading days. The sample data consists of all insider transactions by directors, officers or shareholders with an ownership stake of at least 10% reported under the Form 4 to the SEC of S&P 1500 family firms at the beginning of 2005 between 2005 and 2015. The symbols *, ** and *** indicate two-tail significance at the 10%, 5% and 1% levels, respectively. All continuous variables are winsorized at the 1st and 99th percentile. The intercept is included in regressions but not reported. The standard errors in parentheses refer to heteroskedasticity-consistent standard errors clustered at the firm-level.

	<i>Panel A: Insider purchases</i>		<i>Panel B: Insider sales</i>	
	(1)	(2)	(3)	(4)
Family member	0.0402 (0.0709)	0.0720** (0.0363)	0.0348*** (0.0107)	0.0241*** (0.0086)
Non-management insider	-0.0117 (0.0611)	-0.0310 (0.0771)	0.1110** (0.0533)	0.1070** (0.0457)
Family member*Non-management	-0.0574 (0.0990)	-0.0211 (0.0925)	-0.1740*** (0.0607)	-0.101** (0.0494)
CEO position	0.0533 (0.0599)	0.0135 (0.0347)	-0.0130 (0.0118)	-0.0049 (0.0084)
CFO position	0.0066 (0.0282)	0.0001 (0.0339)	-0.0161* (0.0087)	-0.0167** (0.0081)
Chairman position	0.0464 (0.0712)	0.0230 (0.0432)	0.0027 (0.0177)	-0.0189* (0.0107)
Uncertainty	-0.0046 (0.0279)	-0.0672 (0.0717)	-0.0131 (0.0145)	-0.1630*** (0.0555)
Momentum	-0.1016* (0.0585)	-0.1480** (0.0584)	-0.0326* (0.0171)	-0.0580*** (0.0159)
Trade size	-0.0000* (0.0000)	-0.0000 (0.0000)	-0.0002 (0.0000)	0.0002 (0.0000)
Firm size	-0.0070 (0.0113)		-0.0003 (0.0046)	
Firm valuation	0.0063 (0.0073)		-0.0015 (0.0041)	
Firm profitability	-0.0013 (0.0010)		0.0004 (0.0008)	
F.E. Year	Yes	Yes	Yes	Yes
F.E. Industry	Yes	No	Yes	No
F.E. Firm	No	Yes	No	Yes
Adj. R ²	0.146	0.328	0.028	0.184
N	3,871	3,871	33,141	33,141

Table 5: Summary statistics for insider sales and short sales

This table reports the summary statistics of insider sales (Panel A) and short sales volume (Panel B) made by family and nonfamily insiders in family firms. The sample consists of insider sales reported by all directors, officers and shareholders with an ownership stake of at least 10% in S&P 1500 family firms during the period of February 2005 until and including May 2007 for which daily Reg SHO - NYSE Short Sales was available. The term "family insider" relates to insiders who are part of the founding family by either blood, marriage or adoption at the time of the transaction and is equal to a "nonfamily insider", otherwise. A family insider is considered being part of the founding family if his surname is equal to 1) the surname of the founding family, or equal to 2) the surname of the descendants and/or heirs of the founding family. Insider sale transaction size is defined as the number of shares sold at the insider sale event. Short sale volume is defined as the number of shares that were sold short. All variables in percentages (%) are computed as percentage points relative to the total number of shares outstanding at the time of the insider transaction. The numbers in brackets refer to the trading window, whereas the window [-10,10] includes the 10 trading days prior to the event day, the event day and the 10 trading days after the event day. The window [0] includes short sales that were transacted at the day of the insider sale. The window [-30,-11] includes the 30 trading days up to 11 trading days prior to the insider sale event. The sample includes a total of 127 family firms, 6,051 insider sale events and 126'978 observations during the [-10,10] event window.

<i>Panel A: Insider sales</i>	All insiders					Family member status					
						Family insider			Nonfamily insider		
	Mean	Median	25%	75%	StDev.	Mean	Median	StDev.	Mean	Median	StDev.
Insider sale transaction size	78,571	15,000	5,000	56,400	317,124	129,208	33,100	376,795	39,692	10,406	255,531
Insider sale transaction size (%)	0.070	0.015	0.004	0.044	0.383	0.099	0.022	0.457	0.047	0.012	0.312
<i>Panel B: Short sale volume</i>						Short sales around family insider sale			Short sales around nonfamily insider sale		
	Mean	Median	25%	75%	StDev.	Mean	Median	StDev.	Mean	Median	StDev.
Volume around the event day [-10, 10]	275,915	139,500	49,500	347,000	471,519	313,839	206,600	350,885	246,796	104,000	544,569
Volume on the event day [0]	305,890	160,000	64,350	385,650	447,813	327,481	231,900	337,936	289,311	121,700	515,999
Average volume prior to the window [-30, -11]	270,393	150,105	57,570	368,440	344,276	320,382	263,970	267,899	232,012	105,195	388,633
Volume around the event day [-10, 10] (%)	0.182	0.127	0.067	0.224	0.203	0.186	0.131	0.203	0.178	0.124	0.203
Volume on the event day [0] (%)	0.204	0.142	0.080	0.245	0.222	0.201	0.138	0.220	0.206	0.144	0.223
Average volume prior to the window [-30, -11] (%)	0.172	0.135	0.086	0.216	0.136	0.180	0.141	0.142	0.157	0.124	0.127

Table 6: Family ties, managerial involvement and abnormal short sales volume around insider sales

This table reports in Panel A the summary statistics of daily abnormal short sale volume around the [-10,10] event window of the insider sale. Panel B summarizes the abnormal short sale volume for the three trading windows [-5,0], [-3,0] and [-1,0]. Abnormal short sale volume is defined as the difference between the daily short sale volume within the event window minus the daily average short sale volume during 20 days prior to the insider sale event window [-30,11]. The means were tested using a one-sample t-test against the mean of zero. The symbols *, ** and *** indicate two-tail significance at the 10%, 5% and 1% levels, respectively.

Panel A: Insider sale event window per day

	Management insiders				Non-management insiders			
	Family		Nonfamily		Family		Nonfamily	
	# of events = 1,787		# of events = 3,338		# of events = 842		# of events = 84	
Day	Mean	StDev.	Mean	StDev.	Mean	StDev.	Mean	StDev.
-10	0.0135***	0.1752	0.022***	0.1612	0.0001	0.0940	-0.0149	0.1215
-9	0.0146***	0.1958	0.024***	0.1684	-0.0010	0.1110	-0.0201*	0.1048
-8	0.0163***	0.1901	0.0292***	0.1864	0.0049	0.1250	-0.0293***	0.0879
-7	0.0168***	0.1847	0.0255***	0.1735	0.0054	0.1116	-0.0206**	0.0725
-6	0.0118***	0.1760	0.0238***	0.1717	-0.0069	0.0998	-0.0020	0.0779
-5	0.0145***	0.1894	0.0347***	0.1920	0.0001	0.1130	-0.0022	0.0689
-4	0.0237***	0.1961	0.0396***	0.2003	0.005**	0.1390	0.0085	0.1093
-3	0.021***	0.1931	0.0451***	0.2023	0.0035	0.1214	-0.0070	0.1006
-2	0.0206***	0.2047	0.049***	0.2205	-0.0025	0.1123	-0.0017	0.1109
-1	0.0193***	0.1804	0.0457***	0.2031	0.0050	0.1265	0.0015	0.0899
0	0.0193***	0.2013	0.0465***	0.1995	0.0145**	0.1596	0.0147*	0.0799
1	0.0079*	0.1679	0.0241***	0.1653	-0.0053	0.1120	0.0059	0.1007
2	0.0041	0.1582	0.0107**	0.1447	-0.0077**	0.1156	-0.0070	0.0865
3	0.0115*	0.2043	0.0121**	0.1837	-0.007*	0.1221	-0.0032	0.0967
4	0.0030	0.1666	0.0076*	0.1462	-0.0092**	0.1135	0.0170*	0.0867
5	0.0073	0.1935	0.0037	0.1463	-0.0117***	0.1163	0.0168	0.0933
6	0.0089*	0.2049	0.0073*	0.1667	-0.0109***	0.1239	0.0212	0.0602
7	0.0022	0.1732	0.0062*	0.1665	-0.0145**	0.1005	0.0267**	0.0755
8	-0.0014	0.1718	0.0026	0.1743	-0.0151**	0.1094	0.0195**	0.0843
9	0.0021	0.1726	0.0036	0.1599	-0.0157**	0.1112	0.0154**	0.0692
10	0.0058	0.2051	0.0025	0.1716	-0.0128***	0.1075	0.0194**	0.0844
Obs.	<u>37,527</u>		<u>70,064</u>		<u>17,623</u>		<u>1,764</u>	

Panel B: Trading windows for abnormal short sales

Insider[-5;0]	0.0197***	0.1943	0.0434***	0.2032	0.0043**	0.1297	0.0023	0.0943
Insider[-3;0]	0.0201***	0.1951	0.0466***	0.2065	0.0051**	0.1312	0.0019	0.0959
Insider[-1;0]	0.0193***	0.1911	0.0461***	0.2013	0.0097***	0.1440	0.0081	0.0850

Table 7: Family ties, managerial involvement and abnormal short sales

This table shows the regression analysis for estimating the abnormal short sales around insider sales in family firms. The dependent variable "abnormal short sales" represents the difference between the daily short sale volume within the event window minus the daily average short sale volume during 20 days prior to the insider sale event window [-30,-11]. Insider [-5,0] ([-3,0], [-1,0]) is a dichotomous variable that equals 1 if the short sale was initiated in the 5 (3,1) days prior of and including the insider sale day, and 0 if the short sale was initiated outside of the respective trading window. The term "family member" relates to insiders who are part of the founding family by either blood, marriage or adoption at the time of the transaction. The term "Non-management" refers to an insider who is a major shareholder in accordance with the respective SEC insider trading regulations but holds no management position. The symbols *, ** and *** indicate two-tail significance at the 10%, 5% and 1% levels, respectively. All continuous variables are winsorized at the 1st and 99th percentile. The intercept is included in regressions but not reported. Direct effects and moderating effects which are not of primary interest in this analysis are included but not reported for the ease of interpretation of the results. The standard errors in parentheses refer to heteroskedasticity-consistent standard errors clustered at the event level.

	[-5;0 window]	[-3;0 window]	[-1;0 window]
	(1)	(2)	(3)
Insider[-5;0]	0.0129*** (0.0010)		
Insider[-5;0]*Family member	-0.0027 (0.0024)		
Insider[-5;0]*Family member*Non-management	0.0288*** (0.0048)		
Insider[-3;0]		0.0126*** (0.0011)	
Insider[-3;0]*Family member		-0.0098*** (0.0020)	
Insider[-3;0]*Family member*Non-management		0.0327*** (0.0054)	
Insider[-1;0]			0.0123*** (0.0013)
Insider[-1;0]*Family member			-0.0093*** (0.0023)
Insider[-1;0]*Family member*Non-management			0.0216*** (0.0065)
Direct and moderating effects	Included	Included	Included
Controls	Included	Included	Included
F.E. Year	Yes	Yes	Yes
F.E. Firm	Yes	Yes	Yes
Adj. R ²	0.267	0.267	0.267
N	126,978	126,978	126,978

Appendix 1: Variable definitions

<i>Variable</i>	<i>Description</i>
<i>Buy-and-hold abnormal return (BHAR)</i>	Delta between the buy-and-hold stock return of a family firm and the risk-adjusted expected stock return based on the CAPM model over 120 trading days following the insider transaction
<i>Abnormal short sales volume</i>	Delta between the daily short sales volume during the event window [-10,10] and the daily average short sales volume during the 20 trade days prior to the event window [-30,-11], relative to the total number of shares outstanding
<i>Family firm</i>	Binary variable that equals 1 if the founding family (including descendants and heirs of the founding family) holds at least 5% cumulative equity stake, 0 otherwise
<i>Family member</i>	Binary variable that equals 1 if an insider is related to the founding family of the family firm by either blood, marriage or adoption not more remote than the first cousin, 0 otherwise
<i>Management insider</i>	Binary variable that equals 1 if an insider is either a director, an officer or both a director and an officer at the time of the transaction, irrespective of the insider's shareholdings in the family firm
<i>Non-management insider</i>	Binary variable that equals 1 if an insider is a 10% shareholder but neither a director nor an officer at the time of the transaction, 0 otherwise
<i>CEO</i>	Binary variable that equals 1 if the insider holds the position of a CEO at the time of the transaction, 0 otherwise
<i>CFO</i>	Binary variable that equals 1 if the insider holds the position of a CFO at the time of the transaction, 0 otherwise
<i>Chairman</i>	Binary variable that equals 1 if the insider holds the position of a chairman at the time of the transaction, 0 otherwise
<i>Uncertainty</i>	250-trade days lagging stock volatility of the firm prior one day to the insider trade
<i>Momentum</i>	250-trade-days lagging stock return of the firm prior one day to the insider trade
<i>Trade size</i>	Cumulative number of shares traded on the transaction day per insider
<i>Firm size</i>	Natural logarithm of the total number of employees in the firm at the end of the quarter prior to the quarter of the insider trade
<i>Firm valuation</i>	Price-to-book ratio of the firm at the end of the quarter prior to the quarter of the insider trade
<i>Firm profitability</i>	Return on equity of the firm at the end of the year prior to the year of the insider trade
<i>Insider [-5,0]</i>	Binary variable that equals 1 if the short sale transaction was reported within the 5 trade days prior to and including the insider sale day, 0 otherwise
<i>Insider [-3,0]</i>	Binary variable that equals 1 if the short sale transaction was reported within the 3 trade days prior to and including the insider sale day, 0 otherwise

Appendix 1: Variable definitions (continued)

<i>Variable</i>	<i>Description</i>
<i>Insider [-1,0]</i>	Binary variable that equals 1 if the short sale transaction was reported at the trade day prior to the insider sale day or at the insider sale day, 0 otherwise
<i>Turnover</i>	Natural logarithm of the total daily number of shares traded
<i>Bid-ask spread</i>	Delta between the bid price minus the ask price, divided by the average of the daily bid and ask price
<i>Short_(t-5;t-1)</i>	Cumulative short-selling volume during the 5 trade days prior to the insider sale day, calculated relative to the total number of shares outstanding
<i>CAR_(t-5;t-1)</i>	Cumulative abnormal stock return, adjusted for the S&P500 benchmark return, during the five trade days prior to the insider sale day
<i>AR_t</i>	Abnormal stock return, adjusted for the S&P 500 benchmark return, on the insider sale day
<i>Year</i>	Calendar year of the execution date of insider transaction as reported by the insider
<i>Industry</i>	Standard Industrial Classification (SIC) code of the family firm

Appendix 2: Correlation matrix for insider purchases and sales

This table reports pair-wise Pearson correlations between independent variables used in the regression analyzes for insider purchases (sales) transactions below (above) the diagonal. The table includes all insider transactions completed by officers, directors and/or 10% shareholders in family firms in the S&P 1500 listed at the beginning of 2005 for the period from 2005 until 2015. Continuous variables are winsorized at the 1st and 99th percentile. Note that * $p < 0.05$.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) Family member		0.2757*	0.1966*	-0.1581*	0.3381*	-0.0869*	-0.1381*	0.2424*	0.0165*	-0.0710*	-0.0910*
(2) Non-management insider	-0.1088*		-0.1045*	-0.0669*	-0.0893*	-0.0690*	-0.1350*	0.0696*	-0.0507*	-0.0045	-0.0953*
(3) CEO position	0.5380*	-0.1951*		-0.0895*	0.3958*	0.0293*	0.0196*	0.0588*	-0.0322*	-0.0363*	0.0295*
(4) CFO position	-0.0989*	-0.1257*	-0.1053*		-0.0769*	0.0200*	0.0446*	-0.0476*	-0.0319*	-0.0106	-0.0027
(5) Chairman position	0.3863*	-0.1265*	0.3545*	-0.0683*		0.0339*	0.0221*	0.0321*	-0.0216*	-0.0744*	0.0251*
(6) Uncertainty	-0.0023	0.0075	-0.0537*	-0.0176	0.0439*		0.1457*	-0.0873*	-0.0274*	0.1565*	0.1476*
(7) Momentum	-0.1536*	0.0820*	-0.1229*	0.0282	-0.0255	0.0104		-0.0469*	-0.0458*	0.0149*	-0.0343*
(8) Trade size	0.1068*	0.2657*	0.0177	-0.0568*	0.0905*	-0.0131	0.0009		0.2453*	0.0863*	0.1041*
(9) Firm size	-0.0156	-0.2881*	-0.1107*	-0.0432*	0.0462*	0.0603*	0.0514*	0.0548*		0.0634*	0.2660*
(10) Firm valuation	-0.0303	-0.0256	-0.0229	-0.0685*	-0.0381*	0.2533*	0.1016*	0.0704*	0.1742*		0.3606*
(11) Firm profitability	0.0045	-0.2228*	0.0104	0.0021	0.0373*	0.1841*	0.0879*	0.0147	0.3079*	0.4121*	

Appendix 3: Distribution of insider trades by industry

This table displays the distribution of insider purchases and sales in family firms made between 2005 and 2015 split by the industry of the family firm in which the respective insider trade was transacted. Panel A reports the distribution of transactions by industry for insider purchases. Panel B reports the distribution of transactions by industry for insider sales. Mining includes SIC codes 10-14, Construction includes SIC codes 15-17, Manufacturing includes SIC codes 20-39, Transportation includes SIC codes 40-49, Wholesale Trade includes SIC codes 50-51, Retail Trade includes SIC codes 52-59 and Services includes SIC codes 70-89.

Industry description	No. of transactions	
<i>Panel A: Insider purchases</i>		
Mining	45	1.2%
Construction	106	2.7%
Manufacturing	2,049	52.9%
Transportation	505	13.0%
Wholesale Trade	64	1.7%
Retail Trade	493	12.7%
Services	609	15.7%
<u>Sum</u>	<u>3,871</u>	<u>100.0%</u>
<i>Panel B: Insider sales</i>		
Mining	360	1.1%
Construction	1,085	3.3%
Manufacturing	18,782	56.7%
Transportation	2,174	6.6%
Wholesale Trade	1,038	3.1%
Retail Trade	3,917	11.8%
Services	5,785	17.5%
<u>Sum</u>	<u>33,141</u>	<u>100.0%</u>

Appendix 4: Distribution of insider trades by firm size

This table shows the distribution of insider purchases and sales in family firms made between 2005 and 2015 split by firm size (proxied by firm market value) of the family firm in which the respective insider trade was transacted. Panel A reports the distribution of transactions by firm market value for insider purchases. Panel B reports the distribution of transactions by firm market value for insider sales.

Market value (USD)	No. of transactions	
<i>Panel A: Insider purchases</i>		
<1bn	1'949	50.3%
>=1bn – <5bn	1'070	27.6%
>=5bn – <10bn	281	7.3%
>10bn – <20bn	297	7.7%
>=20bn	274	7.1%
<u>Sum</u>	<u>3,871</u>	<u>100.0%</u>
<i>Panel B: Insider sales</i>		
<1bn	8'606	26.0%
>=1bn – <5bn	12'454	37.6%
>=5bn – <10bn	2'990	9.0%
>10bn – <20bn	4'704	14.2%
>=20bn	4'387	13.2%
<u>Sum</u>	<u>33,141</u>	<u>100.0%</u>

Appendix 5: Distribution of insider trades by month

This table shows the distribution of insider purchases and sales in family firms made between 2005 and 2015 split by the month when the respective insider trade was transacted. Panel A reports the distribution of transactions by month for management insiders. Panel B reports the distribution of transactions by month for non-management insiders.

Panel A: Management insiders									
	(1) Insider purchases					(2) Insider sales			
	Family insider		Nonfamily insider			Family insider		Nonfamily insider	
January	35	7.1%	130	4.9%		517	5.5%	1,222	5.7%
February	68	13.7%	258	9.8%		828	8.9%	2,622	12.2%
March	34	6.9%	261	9.9%		915	9.8%	2,246	10.5%
April	13	2.6%	129	4.9%		732	7.8%	1,394	6.5%
May	43	8.7%	326	12.3%		927	9.9%	2,546	11.9%
June	27	5.4%	167	6.3%		683	7.3%	1,431	6.7%
July	24	4.8%	164	6.2%		628	6.7%	1,298	6.1%
August	53	10.7%	398	15.1%		888	9.5%	1,920	9.0%
September	24	4.8%	129	4.9%		627	6.7%	1,423	6.6%
October	27	5.4%	186	7.0%		661	7.1%	1,345	6.3%
November	103	20.8%	350	13.2%		985	10.6%	2,326	10.9%
December	45	9.1%	146	5.5%		943	10.1%	1,644	7.7%
<u>Sum</u>	<u>496</u>	<u>100.0%</u>	<u>2,644</u>	<u>100.0%</u>		<u>9,334</u>	<u>100.0%</u>	<u>21,417</u>	<u>100.0%</u>

Panel B: Non-management insiders									
	(1) Insider purchases					(2) Insider sales			
	Family insider		Nonfamily insider			Family insider		Nonfamily insider	
January	4	8.9%	62	9.0%		118	6.1%	20	4.4%
February	2	4.4%	83	12.1%		171	8.9%	57	12.4%
March	-	-	94	13.7%		153	7.9%	42	9.2%
April	4	8.9%	23	3.4%		79	4.1%	15	3.3%
May	13	28.9%	41	6.0%		182	9.4%	29	6.3%
June	2	4.4%	33	4.8%		175	9.1%	35	7.6%
July	5	11.1%	79	11.5%		203	10.5%	34	7.4%
August	10	22.2%	73	10.6%		184	9.5%	36	7.9%
September	2	4.4%	40	5.8%		136	7.0%	40	8.7%
October	-	-	42	6.1%		136	7.0%	22	4.8%
November	2	4.4%	49	7.1%		212	11.0%	79	17.2%
December	1	2.2%	67	9.8%		183	9.5%	49	10.7%
<u>Sum</u>	<u>45</u>	<u>100.0%</u>	<u>686</u>	<u>100.0%</u>		<u>1,932</u>	<u>100.0%</u>	<u>458</u>	<u>100.0%</u>

Appendix 6: Determinants of 1-year abnormal stock returns in family firms

This table shows the regression analysis for estimating the 1-year buy-and-hold abnormal returns (BHAR) for insider trades (i.e., officers, directors and/or 10% shareholders) in family firms. 1-year BHARs are calculated in three different ways. The BHAR (1) represents the excess return of the 1-year buy-and-hold return of the respective stock and the 1-year S&P 1500 return. The BHAR (2) represents the excess return of the 1-year buy-and-hold return of the respective stock and a 1-year return of a size-decile matched benchmark portfolio based on market value, reconstituted annually. The BHAR (3) represents the excess return of the 1-year buy-and-hold return of the respective stock and a 1-year buy-and-hold return of a matched firm with the most similar market value, re-matched annually. The sample data consists of all insider transactions reported under Form 4 to the SEC of S&P 1500 family firms between 2005 and 2015. The symbols *, ** and *** indicate two-tail significance at the 10%, 5% and 1% levels, respectively. All continuous variables are winsorized at the 1st and 99th percentile. The intercept is included in regressions but not reported. The standard errors in parentheses are heteroscedasticity-consistent and clustered at the firm-level.

	<i>Panel A: Insider purchases</i>			<i>Panel B: Insider sales</i>		
	BHAR (1)	BHAR (2)	BHAR (3)	BHAR (1)	BHAR (2)	BHAR (3)
Family member	0.1300** (0.0651)	0.1150* (0.0691)	0.1300* (0.0782)	0.0492*** (0.0163)	0.0337** (0.0139)	0.0444* (0.0235)
Non-management insider	-0.0560 (0.1110)	-0.0359 (0.1250)	0.0774 (0.1610)	0.1620* (0.0860)	0.1820** (0.0818)	0.2160* (0.1280)
Family member*Non-management	-0.0102 (0.1320)	-0.0359 (0.1420)	-0.1300 (0.1760)	-0.1540* (0.0906)	-0.1590** (0.0866)	-0.2010* (0.1540)
CEO position	0.0700 (0.0537)	0.0818 (0.0503)	0.1430*** (0.0538)	0.0045 (0.0179)	0.0063 (0.0179)	-0.0107 (0.0245)
CFO position	-0.0403 (0.0556)	-0.0535 (0.0585)	-0.0368 (0.0844)	-0.0126 (0.0102)	-0.0115 (0.0103)	-0.0051 (0.0171)
Chairman position	0.0164 (0.0737)	0.0029 (0.0695)	-0.00437 (0.0808)	-0.0029 (0.0242)	-0.0027 (0.0265)	0.0128 (0.0302)
Uncertainty	-0.2450** (0.1230)	-0.2360* (0.1220)	-0.2910** (0.1260)	-0.2990*** (0.0717)	-0.2870*** (0.0662)	-0.2760*** (0.0863)
Momentum	-0.2780*** (0.0772)	-0.2170*** (0.0776)	-0.2590*** (0.0921)	-0.0952*** (0.0255)	-0.0930*** (0.0267)	-0.1070*** (0.0365)
Trade size	-0.0002 (0.0000)	0.0002 (0.0000)	0.0007 (0.0000)	-0.0002 (0.0000)	-0.0018 (0.0000)	-0.0002 (0.0000)
F.E. Year	Yes	Yes	Yes	Yes	Yes	Yes
F.E. Firm	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R ²	0.505	0.437	0.494	0.269	0.252	0.208
N	3,871	3,871	3,871	33,141	33,141	33,141

Appendix 7: Abnormal stock returns and trading windows

This table shows the regression analysis for estimating the buy-and-hold abnormal returns (BHAR) for insider trades in family firms. The dependent variable BHAR represent the excess return between a buy-and-hold return of a stock of a family firm and the 1-factor expected returns (CAPM) of the respective stock over the period of 120 trading days. The sample data consists of all insider transactions by directors, officers or shareholders with an ownership stake of at least 10% reported under the Form 4 to the SEC of S&P 1500 family firms at the beginning of 2005 between 2005 and 2015. The symbols *, ** and *** indicate two-tail significance at the 10%, 5% and 1% levels, respectively. All continuous variables are winsorized at the 1st and 99th percentile. The intercept is included in regressions but not reported. The standard errors in parentheses refer to heteroskedasticity-consistent standard errors clustered at the firm-level.

	<i>Panel A: Insider purchases</i>		<i>Panel B: Insider sales</i>	
	(1)	(2)	(3)	(4)
Family member	0.0767*	0.0679*	0.0234**	0.0242***
	(0.0441)	(0.0361)	(0.0092)	(0.0087)
Non-management insider	-0.0142	-0.0272	0.1060**	0.1030**
	(0.0826)	(0.0772)	(0.0454)	(0.0446)
Family member*Non-management	-0.0222	-0.0060	-0.1050**	-0.0985**
	(0.0948)	(0.0913)	(0.0486)	(0.0482)
CEO position	0.0008	0.0166	-0.0030	-0.0044
	(0.0365)	(0.0341)	(0.0087)	(0.0084)
CFO position	-0.0017	-0.0022	-0.0162**	-0.0166**
	(0.0372)	(0.0335)	(0.0080)	(0.0081)
Chairman position	0.0515	0.0324	-0.0215**	-0.0188*
	(0.0427)	(0.0423)	(0.0108)	(0.0107)
Uncertainty	-0.0174	-0.0691	-0.1380***	-0.1590***
	(0.0758)	(0.0668)	(0.0504)	(0.0532)
Momentum	-0.1690***	-0.1460**	-0.0649***	-0.0580***
	(0.0554)	(0.0561)	(0.0165)	(0.0161)
Trade size	-0.0042	-0.0002	0.0018	0.0002
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
F.E. Month	Yes	Yes	Yes	Yes
F.E. Year	No	Yes	No	Yes
F.E. Firm	Yes	Yes	Yes	Yes
Adj. R ²	0.283	0.340	0.178	0.188
N	3,871	3,871	33,141	33,141

Appendix 8: Robustness of the dependent variable

This table shows the regression analysis estimating the profitability for insider trades in family firms. The dependent variable BHAR represents the excess return between a buy-and-hold return of a stock of a family firm and the 3-factor expected returns and the 4-factor expected return of the respective stock over the period of 120 trading days. The sample data includes reported insider transactions of S&P 1500 family firms between 2005 and 2015. The symbols *, ** and *** indicate two-tail significance at the 10%, 5% and 1% levels, respectively. All continuous variables are winsorized at the 1st and 99th percentile. The intercept is included in regressions but not reported. The standard errors in parentheses are heteroscedasticity-consistent and clustered at the firm-level.

Panel A:

Dependent variable: BHAR using a Fama-French 3-factor model

	Insider purchases		Insider sales	
	(1)	(2)	(1)	(2)
Family member	0.0519 (0.0742)	0.0794** (0.0379)	0.0334*** (0.0105)	0.0222*** (0.0085)
Non-management insider	-0.0099 (0.0637)	-0.0357 (0.0776)	0.1200** (0.0563)	0.1130** (0.0502)
Family member*Non-management	-0.0639 (0.1060)	-0.0073 (0.0966)	-0.1760*** (0.0632)	-0.1040* (0.0534)
Individual & trade-level controls	Yes	Yes	Yes	Yes
Firm-level controls	Yes	No	Yes	No
F.E. Industry	Yes	No	Yes	No
F.E. Firm	No	Yes	No	Yes
F.E. Year	Yes	Yes	Yes	Yes
Adj. R ²	0.101	0.306	0.077	0.216
N	3,871	3,871	33,141	33,141

Panel B:

Dependent variable: BHAR using a Carhart 4-factor model

	Insider purchases		Insider sales	
	(1)	(2)	(1)	(2)
Family member	0.1050** (0.0488)	0.1140*** (0.0386)	0.0317*** (0.0112)	0.0281** (0.0113)
Non-management insider	0.0266 (0.0665)	-0.0014 (0.0851)	0.1430** (0.0618)	0.1370*** (0.0525)
Family member*Non-management	-0.0862 (0.0947)	-0.0655 (0.1080)	-0.2090*** (0.0671)	-0.1340** (0.0549)
Individual & trade-level controls	Yes	Yes	Yes	Yes
Firm-level controls	Yes	No	Yes	No
F.E. Year	Yes	Yes	Yes	Yes
F.E. Industry	Yes	No	Yes	No
F.E. Firm	No	Yes	No	Yes
Adj. R ²	0.236	0.425	0.081	0.219
N	3,871	3,871	33,141	33,141

Appendix 9: Abnormal short sales around insider sales. Sample split by managerial involvement and family affiliation

This table shows the regression analysis for estimating the abnormal short sales around insider sales in family firms split by managerial involvement and family affiliation in family firms. The dependent variable ‘abnormal short sales’ represents the difference between the daily short sale volume within the event window minus the daily average short sale volume during 20 days prior to the insider sale event window [-30,-11]. The term "family member" relates to insiders who are part of the founding family by either blood, marriage or adoption at the time of the transaction and “Non-family member” otherwise. The term “Management insider” refers to an insider who is either a director or an officer in the family firm. The term “Non-management insider” refers to an insider who is a major shareholder in accordance with the respective SEC insider trading regulations but holds no management position. The symbols *, ** and *** indicate two-tail significance at the 10%, 5% and 1% levels, respectively. Insider [-5;0] as the independent variable. All continuous variables are winsorized at the 1st and 99th percentile. The intercept is included in regressions but not reported. The standard errors in parentheses refer to heteroskedasticity-consistent standard errors clustered at the event level.

	Management insiders		Non-management insiders	
	Family	Nonfamily	Family	Nonfamily
	(1)	(2)	(3)	(4)
Insider[-5;0]	0.0037** (0.0015)	0.0127*** (0.0010)	0.0051*** (0.0016)	-0.0105*** -0.0039
Insider[-3;0]	0.0025 (0.0016)	0.0124*** (0.0011)	0.0044*** (0.0017)	-0.0126*** (0.0044)
Insider[-1;0]	0.0028 (0.0018)	0.0121*** (0.0013)	0.0061*** (0.0022)	-0.0033 (0.0055)
Controls	Included	Included	Included	Included
F.E. Firm	Yes	Yes	Yes	Yes
F.E. Year	Yes	Yes	Yes	Yes
Adj. R ²	0.249	0.287	0.347	0.443
N	37,527	70,064	17,623	1,764

Appendix 10: Family ties and abnormal short sales

This table shows the regression analysis for estimating the abnormal short sales around insider sales in family firms. The dependent variable ‘abnormal short sales’ is defined as the difference between the daily short sale volume within the event window minus the daily average short sale volume during 20 days prior to the insider sale event window [-30,-11]. The term "family member" relates to insiders who are part of the founding family by either blood, marriage or adoption at the time of the transaction. Insider [-5,0] ([-3,0], [-1,0]) is a dichotomous variable that equals 1 if the short sale was initiated in the 5 (3,1) days prior of and including the insider sale day, and 0 if the short sale was initiated outside of the respective trading window. The symbols *, ** and *** indicate two-tail significance at the 10%, 5% and 1% levels, respectively. All continuous variables are winsorized at the 1st and 99th percentile. The intercept is included in regressions but not reported. The standard errors in parentheses refer to heteroskedasticity-consistent standard errors clustered at the event level.

	(1)	(2)	(3)
Insider[-5;0]	0.0122*** (0.0010)		
Insider[-3;0]		0.0119*** (0.0011)	
Insider[-1;0]			0.0119*** (0.0013)
Family member	-0.0026 (0.0023)	-0.0032 (0.0023)	-0.0041* (0.0022)
Insider[-5;0]*Family member	-0.0078*** (0.0015)		
Insider[-3;0]*Family member		-0.0085*** (0.0017)	
Insider[-1;0]*Family member			-0.0079*** (0.0020)
Turnover	0.0772*** (0.0012)	0.0773*** (0.0012)	0.0775*** (0.0012)
Bid-ask spread	1.1696*** (0.3059)	1.1807*** (0.3058)	1.1784*** (0.3059)
Short _(t-5;t-1)	0.0410*** (0.0021)	0.0410*** (0.0021)	0.0410*** (0.0021)
CAR _(t-5;t-1)	-0.0001 (0.0002)	-0.0001 (0.0002)	-0.0001 (0.0002)
AR _t	0.0141*** (0.0003)	0.0141*** (0.0003)	0.0142*** (0.0003)
F.E. Year	Yes	Yes	Yes
F.E. Firm	Yes	Yes	Yes
Adj. R ²	0.267	0.267	0.267
N	126,978	126,978	126,978

Appendix 11: Family ties, managerial involvement and abnormal short sales

This table shows the regression analysis for estimating the abnormal short sales around insider sales in family firms, split by “management insiders” who are either a director or an officer in the family firm and “non-management insider who have at least a 10% equity stake in the firm but hold no management position. The dependent variable ‘abnormal short sales’ represents the difference between the daily short sale volume within the event window minus the daily average short sale volume during 20 days prior to the insider sale event window [-30,-11]. Insider [-5,0] ([-3,0], [-1,0]) is a dichotomous variable that equals 1 if the short sale was initiated in the 5 (3,1) days prior of and including the insider sale day, and 0 if the short sale was initiated outside of the respective trading window. The symbols *, ** and *** indicate two-tail significance at the 10%, 5% and 1% levels, respectively. All continuous variables are winsorized at the 1st and 99th percentile. The intercept is included in regressions but not reported. The standard errors in parentheses refer to heteroskedasticity-consistent standard errors clustered at the event level.

	Management insiders			Non-management insiders		
	(1)	(2)	(3)	(4)	(5)	(6)
Insider[-5;0]	0.0127*** (0.0010)			-0.0146*** (0.0043)		
Insider[-3;0]		0.0124*** (0.0011)			-0.0191*** (0.0049)	
Insider[-1;0]			0.0121*** (0.0013)			-0.0076 (0.0058)
Family member	-0.0025 (0.0025)	-0.0032 (0.0024)	-0.0042* (0.0024)	0.0066 (0.0106)	0.0078 (0.0107)	0.0110 (0.0108)
Insider[-5;0]*Family member	-0.0089*** (0.0018)			0.0199*** (0.0046)		
Insider[-3;0]*Family member		-0.0096*** (0.0020)			0.0237*** (0.0052)	
Insider[-1;0]*Family member			-0.0091*** (0.0023)			0.0139** (0.0062)
Turnover	0.0770*** (0.0013)	0.0771*** (0.0013)	0.0773*** (0.0013)	0.0814*** (0.0024)	0.0815*** (0.0024)	0.0813*** (0.0024)
Bid-ask spread	0.7281** (0.3205)	0.7430** (0.3204)	0.7389** (0.3205)	0.5702 (0.7593)	0.5809 (0.7587)	0.5768 (0.7591)
Short _(t-5;t-1)	0.0416*** (0.0022)	0.0416*** (0.0022)	0.0416*** (0.0022)	0.0344*** (0.0046)	0.0344*** (0.0046)	0.0344*** (0.0046)
CAR _(t-5;t-1)	0.0001 (0.0003)	0.0001 (0.0003)	0.0001 (0.0003)	-0.0006* (0.0003)	-0.0006* (0.0003)	-0.0006* (0.0003)
AR _t	0.0153*** (0.0003)	0.0154*** (0.0003)	0.0154*** (0.0003)	0.0099*** (0.0004)	0.0099*** (0.0004)	0.0099*** (0.0004)
F.E. Year	Yes	Yes	Yes	Yes	Yes	Yes
F.E. Firm	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R ²	0.261	0.260	0.260	0.347	0.347	0.346
N	107,591	107,591	107,591	19,387	19,387	19,387

[This page intentionally left blank]

Chapter III

Does Capital Foster Growth Opportunities?
A Growth Options Perspective on Newly Public
Family Firms

Does Capital Foster Growth Opportunities?

A Growth Options Perspective on Newly Public Family Firms

Tobias H. Schori ^a

Abstract

With an Initial Public Offering (IPO), family firms gain access to capital markets and can use the proceeds to invest in profitable growth projects. Concurrently, going public often implies a loss of noneconomic utility for family firms. We suggest that family firms may accept such an initial loss of noneconomic wealth but use the proceeds to allocate funds in strategic investments that create more growth opportunities in the future, thereby financially compensating for their noneconomic loss. Building on real options theory, the aim of this study is to gain insights on the effects of capital infusion on growth option value in newly public family firms and to develop an understanding how family firms may seek financial compensation after having accepted a loss of noneconomic wealth. The empirical analysis of 591 IPOs lends support to our theoretical expectations. We explore two uncertainty dimensions as boundary conditions and find that our results are more pronounced under high market and technological uncertainty, where investments in growth options tend to be particularly risky, but also potentially offer a higher future payoff for family firms.

Keywords: *Real options theory, family business, Initial Public Offering*

^a University of St. Gallen, The St.Gallen Institute of Management in Asia, 111 Amoy Street, Singapore 069931; tobias.schori@unisg.ch

1 INTRODUCTION

Growth opportunities, defined as investment opportunities with an uncertain future payoff (Myers, 1977), are an important source for firms to create long-term and sustainable firm value (Reuer & Tong, 2005). An Initial Public Offering (IPO) can be a particularly beneficial situation to create firm value because newly available proceeds can be used to finance growth projects and to invest in such promising growth opportunities (Reuer & Tong, 2010; Certo et al., 2009). The capital infusion at IPO may allow firms to strategically assess their project portfolio, to invest in long-term projects where competitive advantages are most promising (Ritter & Welch, 2002), where large upfront investments are required or no immediate payoff structure is expected (Adner & Levinthal, 2004; Folta & O'Brien, 2004).

In this context, we investigate the investment behavior in growth opportunities of newly public family firms. Family firms not only intend to maximize firm value but are often confronted with a trade-off of economic and non-economic considerations as part of their decision-making (Gomez-Mejia et al., 2018; Kotlar et al., 2017; Chrisman & Patel, 2012), whereas family owners tend to take strategic decisions to avoid a loss of noneconomic wealth at the expense of financial gains (Gomez-Mejia et al., 2007). We focus on family firms that undergo an IPO because besides having an opportunity to use the IPO proceeds to create firm value, going public also results in a loss of noneconomic wealth for family firms, for example due to a new ownership structure, increased public market expectations, new regulatory requirements to curb family specific governance arrangements as well as increased reputational concerns (Kotlar et al., 2017; Leitterstorf & Rau, 2014). In addition, going public is a transformational change event (Fischer & Pollock, 2004) that encompasses significant changes in the organizational setup and governance structure (Ragozzino & Reuer, 2011; Certo et al., 2009). Put differently, for family firms, an IPO could be perceived as an opportunity to grow the business, but potentially at the expense of a loss of noneconomic wealth. Importantly, our study focuses on newly public family firms in which family owners, despite a change in ownership structure due to the public offering, retain substantial control which allows them to continuously influence financial decision-making (e.g., Kotlar et al., 2017).

We build on real options theory (Myers, 1977; Miller & Modigliani, 1961) to explore how newly public firms use real options that contain growth opportunities to capture additional growth option value. We develop our theoretical framework in two iterative steps. First, we investigate how firms may invest proceeds from going public in real options that contain growth opportunities to capture additional growth option value. Second, we explore how the presence of family owners in newly public firms affects this relationship. We use real options theory because it provides a robust theoretical framework to develop our hypothesis in this study. First, it has been used extensively in strategic management literature to study investment decisions on a firm level (e.g., Reuer & Tong, 2010; Tong & Li, 2011). Second, investments in growth opportunities, and thus growth option value, are contingent of a firm's distinct ability and willingness to make such commitments (Reuer & Tong, 2005; McGrath & Nerkar, 2004). In other words, growth option value in firms is not only the result of industry-specific factors, but also, in part a result of managerial investment decisions (Alessandri et al., 2012). This is important because it allows us, by using a theoretical framework, to draw inferences how firms may capture growth option value after going public. Third, the characteristics of growth options, such as long-term investment horizons, uncertain payoffs and an asymmetrical risk distribution (Folta & O'Brien, 2004; Smit & Trigeorgis, 2004) may be closely aligned with family firm characteristics, such as long-term investment orientation (Anderson & Reeb, 2003a) or risk preferences, particularly against the backdrop of a loss aversion towards socioemotional wealth (Kotlar et al., 2017; Gomez-Mejia et al., 2017).

Our empirical analysis uses a panel dataset of 591 IPO firms listed in the United States in the years from 2004 to 2007, comprising a total of 2,213 firm-year observations. Our focal dependent variable is growth option value which we define as the proportion of a firm's value attributable to growth options (Reuer & Tong, 2010; Kester, 1984). We find that the proceeds received during going public is positively related to growth option value in newly public firms, thereby corroborating real options' theoretical predictions. Furthermore, the relationship between IPO proceeds and growth option value is more pronounced in newly public family firms, compared to newly public non-family firms. Lastly, by investigating two boundary conditions to our main hypotheses,

we find support that this effect is stronger in environments with high technical and high market uncertainty, suggesting that family firms have a higher propensity to invest in growth opportunities when exposed to highly uncertain environments.

With these findings, our study makes several contributions. First, our research contributes to IPO research in family firms (Kotlar et al., 2017; Leitterstorf & Rau, 2014) and offers an explanation how family firms may allocate available funds to strategic investments after going public that contain more long-term and sustainable value. We thereby extend family business research focusing on trade-offs between noneconomic and economic wealth considerations (e.g., Gomez-Mejia et al., 2018; 2007; Chrisman & Patel, 2012) by exploring how strategic decisions change after a loss of noneconomic wealth, as suggested in Kotlar et al. (2017). As family firms tend to display a loss aversion towards noneconomic wealth (Gomez-Mejia et al., 2007), our results contribute to research indicating that family owners may seek some form of financial compensation once loss of noneconomic wealth has occurred (Wasserman, 2017; 2006; Zellweger et al., 2012). Second, we show that the family firm, as a distinct organizational form, can be an important source of firm heterogeneity to influence strategic investment allocation and growth option value in newly public firms (Alessandri et al., 2012; Adner & Levinthal, 2004). Our findings are important because, despite research reiterating the importance of firm heterogeneity and managerial foresight in real options theory (e.g., Reuer & Tong, 2005; Adner & Levinthal, 2004; McGrath et al., 2004), research is scarce. Third, our findings contribute towards advancing real options theory by suggesting how newly public firms can capture growth option value from going public and highlight that IPOs indeed can be an important opportunity for firms to capture growth option value (Reuer & Tong, 2010).

2 THEORETICAL BACKGROUND

Real options theory is conceptually rooted in the observation that firm value consists of two distinct components (Myers, 1977; Miller & Modigliani, 1961). While the first component comprises the present value of cash flows generated by the assets available to the firm, the second components is the present value of growth opportunities. Myers

(1977) suggests that the value of growth opportunities results from the firm's discretion to exercise or abandon the option to undertake an investment in the future. In contrast to the traditional view suggesting firm value is solely derived from cash flows, the value of growth options is here derived from future, unrealized growth potential. Real options theory makes three key assumptions which help to better understand firm heterogeneity in growth option value and how firms can obtain and possess distinct growth opportunities. First, the theory assumes that managers possess sufficient foresight and skills to engage in writing a contract that includes either implicit or explicit claims for growth opportunities (Leiblein, 2003). This implies that the value of growth options is, in part, determined based on managerial foresight and skills. Second, real options theory assumes that the value of growth options can be estimated a priori, given certain levels of risks and probabilities of expected outcomes, rather than uncertainty where outcomes cannot be estimated (Adner & Levinthal, 2004). Consequently, it is suggested that the value of growth options in a firm is not a coincidental outcome but a consequence of deliberately assessing the probabilities of outcomes of each option and acting accordingly (Leiblein, 2003). This assumption allows us to draw inferences on how firms may allocate funds after going public by investigating a firm's growth option value. Third, the payoff structure of growth options is asymmetrical (Smit & Trigeorgis, 2004). Specifically, theory suggests that while the upside potential is unbounded, the downside risks of growth options are theoretically limited to its initial commitments (Folta & O'Brien, 2004).

Given that growth option value is contingent on managerial discretion and often comprises large portions of the overall firm value (Kester, 1984), the question how firm-level characteristics and organizational forms affect the value of growth opportunities has gained increasing traction in the management and strategy literature, both theoretically (Adner & Levinthal, 2004; McGrath et al., 2004; Leiblein, 2003) as well as empirically (Alessandri et al., 2012; Fisch & Zschoche, 2012; Reuer & Tong, 2010).

3 HYPOTHESIS DEVELOPMENT

3.1 Real options theory in newly public firms

Interestingly, with a few exceptions (e.g., Reuer & Tong, 2010), real options theory has received limited attention in the context of Initial Public Offerings and newly public firms. This is surprising for at least two reasons. First, an Initial Public Offering is an opportunity for firms to raise capital and finance growth opportunities and profitable projects (Certo et al., 2009). The proceeds received during a public offering can be invested directly at the discretion of a firm's management or be kept idle until new business opportunities arise in the future. As the proceeds from a public offering can be substantial, these situations may offer a unique opportunity for firms to assess their strategic priorities and to capitalize on their competitive advantages. From a real options perspective, the proceeds from a public offering provide the management of newly public firms with a set of options to choose from, for example whether to invest in real assets to generate certain, immediate cash flows or to invest in real options which offer future, uncertain payoffs (Kogut & Kulatilaka, 2001). As such, newly public firms may have to strike a balance between investing in real assets and investing in real options. Second, going public also implies a significant level of uncertainty induced by the transformation process as well as risk of failure once the firm is publicly listed (Fama & French, 2004; Certo et al., 2001). Investments in growth options can become particularly valuable in uncertain environments (Folta & O'Brien, 2004) which makes strategic investment decisions by newly public firms incrementally relevant from a real options perspective. A firm's decision of how to strategically allocate proceeds from the public offering in a portfolio of projects should play an important role for a firm's survival (Folta & O'Brien, 2004). The amount of capital received may thereby play a decisive role in influencing such strategic investment allocation decisions. Importantly, because real options theory suggests that a firm's growth option value is in part contingent on managerial discretion and foresight (Alessandri et al., 2012; Adner & Levinthal, 2004), the available capital after going public must be deliberately invested in growth options in order to create growth option value. We expect that the amount of proceeds obtained during an IPO will be positively associated with a firm's growth option value.

First, real options theory suggests that valuable growth options are dependent on sequential investment commitments (i.e., sunk costs) which are required to exploit growth opportunities in the future (Adner & Levinthal, 2004; Miller & Folta, 2002). For example, large corporations may set up foreign subsidiaries as growth options which however may require substantial initial investments (Fisch, 2008). Obtaining growth options through corporate venture capital investments can only be obtained through purchasing an initial equity stake (Tong & Li, 2011). Similarly, joint ventures require investments as firms commit to purchase a share of equity ownership at the formation stage of the joint venture (Tong & Li, 2013). Lastly, investments in the development and subsequent commercialization of innovations and technologies also often requires substantial capital expenditures (Levitas & Chi, 2010). Investing in projects with high expected growth option value should also require higher initial (or even sequential) investments. Firms that raise more capital during a public offering should have more opportunities to pursue investments in real options with higher initial investment commitments and be more inclined to pursue growth opportunities that require sequential investments in the future. In turn, greater initial investments can reduce the likelihood of investing in real options (Folta & O'Brien, 2004).

Second, flexibility generally increases the value of real options (Tong & Li, 2013; 2011; Kogut & Kulatilaka, 1994). On the one hand, the option to abandon projects with unfavorable cash flow projections can contain the downside risk and allows the firm to subsequently allocate sources to other projects (Adner & Levinthal, 2004). On the other hand, higher flexibility also allows firms to defer decision-making concerning whether to invest or abandon, such as incremental investments in venture capital, to gather sufficient information (Tong & Li, 2011). While more flexibility is generally beneficial, such projects can however contain more risk (Adner & Levinthal, 2004) and often require more capital investments (Folta & O'Brien, 2004). As newly public firms obtain new ways of funding projects through capital infusion, they may become less dependent on projects with short-term cash flows which increases managerial and operational flexibility. Consequently, firms may invest in real options with longer time horizons and may be more inclined to make use of deferral options if they are able to raise sufficient capital with positively influences growth option value.

Third, obtaining additional capital after going public may also reduce the likelihood of having to choose between competing growth options (Fisch & Zschoche, 2012). Given that multiple growth options can be available to the firm, such options can become mutually exclusive if a firm's resources are limited to make relevant initial investments. For example, if a firm intends to simultaneously develop alternative technologies for its product portfolio, under limited resources, such options may become mutually exclusive (Oriani & Sobrero, 2008). In contrast, if sufficient funds are available to a firm, the management may decide to invest in several, potentially competing, R&D projects that contain valuable growth opportunities.

Fourth, most investments in real options are at least partially irreversible (Adner & Levinthal, 2004; Folta & O'Brien, 2004), with the value of growth options increasing as investments become more irreversible. Investments in such projects however require significant commitments to resources and are, by definition, cumbersome to reverse (Tong & Li, 2011). When firms raise capital, the proceeds obtained may enable firms to commit to investments that involve higher levels of irreversibility. In contrast, with limited resources to invest in new projects, firms may refrain from investing in projects that are irreversible as the resources are required for other projects. Consequently, we expect that firms that receive more proceeds at a public offering will commit more investments into projects that have high levels of irreversibility and contain higher growth option values.

Taken together, these arguments suggest that the amount of proceeds received during an Initial Public Offering will be positively associated with the firm's growth option value, as summarized in Hypothesis 1 (H1).

H1: The amount of proceeds received during an Initial Public Offering will be positively associated with the firm's growth option value.

3.2 Newly public family firms and growth option value

Commitments in corporate investments can create valuable growth options, such as investments in joint ventures (Tong et al., 2008; Reuer & Tong, 2005), foreign subsidiaries (Fisch, 2008), venture capital (Tong & Li, 2011) or innovative technologies (Oriani & Sobrero, 2008; Hurry et al., 1992). While research suggests that the value of such growth options largely depends on the managerial foresight and individual managerial capabilities (Reuer & Tong, 2005; McGrath et al., 2004), surprisingly, with a few exceptions (e.g., Alessandri et al., 2012), research on firm heterogeneity and the sources of growth option value on a firm level is relatively scarce. Similarly, Adner and Levinthal (2004) argue that research focusing on real option theory has largely overlooked the nuancing effects of organizational forms and managerial activities on growth option value which makes it an important task to integrate organizational factors into real options logic. Real options theory suggests that investments in real options are deliberate strategic decision which need to be committed by a firm's management (Alessandri et al., 2012). Thus, a firm's strategic orientation and priorities may significantly affect its propensity towards investing in such growth opportunities (Adner & Levinthal, 2004). While firms can choose to keep cash idle or to invest some of their IPO proceeds from going public into real options, we hypothesize that family firms are a distinct organizational form that may display a higher propensity to allocate more of its proceeds into real options.

Going public is a key strategic decision, family firms – like any other firm - have to make over the course of their existence (Certo et al., 2009). Arguably, many firms cannot go public due to inherent organizational characteristics while others may also deliberately choose not to go public (Nelson, 2003). For firms that go public, an IPO creates an opportunity for existing shareholders to exit the firm or to cash out part of their accumulated wealth in the firm (Ritter & Welch, 2002). For family shareholders in particular, going public may be a profitable opportunity to diversify personal wealth in the firm through offering a portion of existing shares to the public. As personal wealth of the firm management is often concentrated in private firms (Daily et al., 2003), personal investments can be diversified at an IPO without giving up all the family control. However, research indicates that a substantial portion of founding family firms retain

control over their business after going public (Villalonga & Amit, 2006; Anderson & Reeb, 2003). In our study, we focus on family firms in which family owners retain significant influence over the firm, even after going public through firm ownership as well as their presence in the firm's management (see e.g., Kotlar et al., 2017). In robustness tests, we account for cases where family owners may decide to offer some of their existing shares to cash out.

Family owners that intend to retain firm control after going public often accept a loss of noneconomic wealth (Kotlar et al., 2017; Leitterstorf & Rau, 2014). Importantly, a loss of noneconomic wealth in family firms may occur for several reasons. For instance, as a result of an IPO, family owners necessarily accept a change in the ownership structure of the firm and often concede to a dilution of control to raise sufficient capital (Kotlar et al., 2017). For example, Wasserman (2017; 2006) suggests that already early on in a firm's lifecycle start-up founders may face a tradeoff between control and growth as they seek additional, external financing. In contrast, nonfamily firms may not have such distinct intentions for long-term control and may go public due to more opportunistic reasons, such as favorable stock markets (Loughran & Ritter, 2004). Lower control may impede a family owners' ability to exert influence on the strategic decision process (Zellweger et al., 2012) or to obtain and extract socioemotional wealth (Gomez-Mejia et al., 2007). Furthermore, after going public, family shareholders can no longer unanimously select new shareholders because equity is freely traded in the public market (Nelson, 2003). New outside blockholders may restrict the board influence of the family management and may impose governance structures to reduce family-internal conflicts and to limit family nepotism (Schulze et al., 2003). In addition, the stock market as well as market regulators can act as a discipline device, and may expose inefficient managerial decisions, such as unfair compensation schemes for family managers (Pagano et al., 1998). Lastly, public firms are prone to increased public visibility in the market and increased reputational concerns (Hsu et al., 2010) which may adversely affect a family firm's desire to preserve their reputation and legacy (Gomez-Mejia et al., 2007). As a result, we suggest that family owners that intend to stay in the family firm and to further

grow their business after going public may face a trade-off between economic and noneconomic interests²⁵.

We posit that the positive relationship between proceeds received and growth option value will be stronger in newly public family firms, compared to newly public non-family firms. First, real options theory suggests that real options exhibit an asymmetrical risk distribution (McGrath & Nerkar, 2004; Bowman & Hurry, 1993). In other words, by investing in real options firms can enhance firm value with substantial upside potential, while limiting the downside risk of their investments. The option to abandon or divest a project thereby provides firms with the flexibility to limit losses to the extent of their initial commitment in the event of negative market development (Kogut, 1991). The asymmetrical risk distribution may speak to the risk profile of family firms who exhibit a loss-averse behavior with respect to their noneconomic wealth embedded in the firm (Gomez-Mejia et al., 2007; Wiseman & Gomez-Mejia, 1998). Thus, family firms often take strategic decisions to avoid a loss of noneconomic wealth, even if this results in detrimental financial outcomes (Chrisman & Patel, 2012). The asymmetrical payoff distribution of real options may allow family firms to allocate available funds into projects while limiting future losses that may further deteriorate family wealth. As a result, family firms may create future firm value while the financial downside risks of their investments can be limited, and noneconomic family interests can be preserved. Kotlar et al. (2017) and Leitterstorf and Rau (2014) show that family firms forgo financial wealth to preserve noneconomic interests at the time of going public but concurrently suggest that the situation may change after family firms have decided to go public. As family firms have already accepted an initial loss of noneconomic wealth, they may want to invest in profitable projects after going public where future, potential losses can be limited. Thus, the notion that noneconomic interests take precedence may not necessarily hold, after some noneconomic wealth has been relinquished. The prior loss of noneconomic wealth in family firms may thereby alternate a firm's future investment

²⁵ The notion that family firms often face a trade-off between distinct and conflicting economic and noneconomic interests as part of their strategic decision-making process is a well-established concept in management and strategy research (e.g., Gomez-Mejia et al., 2018; Kotlar et al., 2017; Leitterstorf & Rau, 2014; Chrisman & Patel, 2012).

decision to focus on maximizing future wealth outcomes while the downside risk of such investment can be managed (Kotlar et al., 2017).

Second, real options tend to have a long-term payoff structure (Alessandri et al., 2012; Smit & Trigeorgis, 2004). The value of real options increases with longer time horizons as it allows firms to postpone the final decision to invest in a project until a later date in the future and provides more flexibility to abandon projects (Adner & Levinthal, 2004). Correspondingly, research suggests that family firms exhibit longer investment horizons and put strong emphasis on long-term investments (Villalonga & Amit, 2006; Anderson & Reeb, 2004). Intentions to pass on the family business to the next generations (Zellweger et al., 2012) allows family firms to apply more long-term investment strategies which may increase the likelihood to invest in real options and allocate sequential investments with longer time horizons. In addition, given the uncertain, future payoff of growth options, family firms with their long-term investment horizon should be more likely to accept such uncertain payoffs (Carpenter & Sanders, 2002). In nonfamily firms, investment horizons tend to be more short-term, particularly in newly public nonfamily firms (Bruton et al., 2010; Lee & O'Neill, 2003). In contrast to family firms, managerial decision-making in nonfamily firms may focus on maximizing short-term gains and creating short-term value, which cannot be attained through investments in growth opportunities. Thus, newly public family firms may invest more available funds into projects with longer-term investment horizons which increases the value implied in growth opportunities in family firms.

Third, founding families often hold substantial firm ownership in public family firms, which, even after going public, allows them to exert significant control over the firm's strategic decisions (Villalonga & Amit, 2006; Anderson & Reeb, 2003a). Given that our study focuses on newly public family firms which remain in the management, following real options theory, family ownership should positively affect a firm's propensity to invest in real options because the underlying incentive mechanisms of (family firm) ownership are aligned with the generic payoff structure of real options (Coles et al., 2006). In contrast, nonfamily firms with dispersed ownership may be challenged with managerial myopia and misaligned incentive structures (Smit & Trigeorgis, 2004). For example, Alessandri et al. (2012) show that managerial stock ownership is positively

associated with growth option value. Thereby, family ownership in newly public family firms should have an overall positive influence on the investment decisions to invest in real options due to the alignment of the payoff structure in real options and family firm ownership²⁶. In sum, we expect that the positive relationship between the amount of proceeds received during an Initial Public Offering and the growth option value of a firm will be stronger in newly public family firms, compared to newly public nonfamily firms, as summarized in Hypothesis 2 (H2).

H2: The positive relationship between IPO proceeds and growth option value will be stronger in newly public family firms, compared to newly public nonfamily firms.

3.3 The contingent effects of uncertain environments

The above theoretical elaborations emphasize the presence of founding families as a source of growth option value. In this section, we add further nuance to this argument by analyzing the contingent effects of uncertain environments, in which newly public family firms may be embedded in. Incorporating contingencies of uncertain environments in our theoretical framework is important because real options theory suggests that the value of real options is closely tied to the level of environmental uncertainty a firm operates in (Adner & Levinthal, 2004). In uncertain environments, both upside potential as well as downside risk of a real option increases (Levitas & Chi, 2010). However, given that real options have an asymmetrical risk distribution, they generally become more valuable at high levels of uncertainty (Kester, 1984). In our study, we follow a large body of existing research and focus on exogenous uncertainty to contextualize the impact of family firm presence on growth option value in newly public firms (e.g.,

²⁶ Arguably, other significant blockholders which are not family owners may display similar characteristics particularly regarding firm ownership or even long-term investment behavior. In robustness test, we use institutional blockholder ownership as a counterfactual to test whether family owners are a distinct group of firm owners.

Belderbos et al., 2019; Tong & Li, 2011; Levitas & Chi, 2010; Folta & O'Brien, 2004)²⁷. Specifically, we analyze the contingent effects of two complementary forms of exogenous uncertainty, i.e., technological and market uncertainty (Oriani & Sobrero, 2008).

First, firms operating in high-technology environments tend to be exposed to high levels of exogenous uncertainty. For example, technological innovations are more likely to disrupt firms in high-technology environments, embedded in fast-paced settings, which adds uncertainty to a firm's business model (Tong & Li, 2011). The risk of technological innovations by rivals in high-technology environments may force firms to identify particularly valuable growth opportunities to successfully rival with competitors (Folta & Miller, 2002). High-technology environments are also often associated with patents (Levitas & Chi, 2010; McGrath & Nerkar, 2004) which can be a source of a strategic advantage but often require large upfront investments research and development with uncertain outcomes. We expect that the relationship between received IPO proceeds and growth option value will be particularly attenuated for newly public family firms in high-technology environments. As family firms may seek financial compensation for the loss of noneconomic wealth, after such a loss has occurred (Kotlar et al., 2017), the environment in which family firms may affect their propensity to allocate proceeds into profitable growth opportunities. In particular, the asymmetrical risk distribution of real options (Kester, 1984) may become particularly valuable for family firms in highly uncertain environments, whereby family firms can increase their expected financial payoff to compensate for the loss of noneconomic wealth while curtailing the downside risks of investments in real options. Investments in growth opportunities in situations with high technological uncertainty should thus become particularly valuable for newly public family firms. Following this argument, we expect that the positive effect of family firm presence on the relationship between IPO proceeds and growth option value should be stronger when the newly public family firm is exposed to high technological uncertainty, compared to newly public family firms, which are exposed to low technological uncertainty, as summarized in Hypothesis 3 (H3).

²⁷ While endogenous uncertainty refers to situations where uncertainty can be reduced by actions taken by the firm, exogenous uncertainty relates to an environment which evolves independently of a firm's action and beyond the control of the firm.

H3: The positive influence of family firm presence on the relationship between IPO proceeds and growth option value will be stronger for newly public family firms exposed to high technological uncertainty than for newly public family firms exposed to low technological uncertainty.

Second, we investigate the influence of market uncertainty on the relationship between family owner presence and growth option value. Firms embedded in environments with high market uncertainty may put more emphasis on investments in valuable growth opportunities to stay ahead of their rivals and to innovate (Kulatilaka & Perotti, 1998). High market uncertainty may also require firms to swiftly react to sudden changes in market demands, where investments in growth options become particularly valuable (Tong & Li, 2011). Thereby, the value implied in growth options from being able to postpone further commitments until uncertainty has been resolved becomes strategically important (Adner & Levinthal, 2004). Related to technological uncertainty, we expect that the relationship between IPO proceeds and growth option value will be stronger for newly public family firms exposed to high market uncertainty, compared to newly public family firms which are embedded in environments with lower market uncertainty, as summarized in Hypothesis 4 (H4).

H4: The positive influence of family firm presence on the relationship between IPO proceeds and growth option value will be stronger for newly public family firms exposed to high market uncertainty than for newly public family firms exposed to low market uncertainty.

4 SAMPLE & METHOD

4.1 Sample

To test our hypotheses, we develop an initial sample frame based on IPOs completed in the United States between 2004 and 2007. The sample is compiled from the Ritter IPO database (Loughran & Ritter, 2004), which has been widely used in strategy research (e.g., Chadwick et al., 2016; Lungeanu & Zajac, 2016). To address cyclicity patterns of IPO activity (Loughran & Ritter, 2004), the time frame spans multiple years. We constrain the frame to avoid potentially distorting effect resulting from the Internet Bubble before 2004 (Leitterstorf & Rau, 2014) as well as unwanted effects resulting from the Financial Crisis starting in 2008²⁸. Following extensive prior IPO research, we further exclude ADRs, closed-end funds and REITs (Chadwick et al., 2016; Acharya & Pollock, 2013; Reuer & Tong, 2010; Fischer & Pollock, 2004). We then complement the initial sample of IPO firms with information from three additional, complementary sources. First, we merge the sample with financial information regarding Initial Public Offering (such as the offering price or the IPO proceeds obtained) retrieved from the SDC Platinum database (Lungeanu & Zajac, 2016). Second, we append the sample with annual financial information from Thomson Reuters for a duration of maximum five years after going public. We do so because firms should only be considered as newly public during the initial five years following the public offering (e.g., Acharya & Pollock, 2013; Ragozzino & Reuer, 2011). To avoid a potential survivorship bias in our sample, we allow firms to delist during the post-IPO observation period, in which case we drop delisted firms from the sample after delisting occurred (Acharya & Pollock, 2013). Third, to identify family firms, we consult the IPO prospectus filed through The Securities and Exchange Commission (SEC) and hand-collect detailed ownership and management data for the time of the public offering for all firms in the initial sample²⁹. Under

²⁸ Our time span only covers IPOs completed during an economic upswing period to avoid that the cyclicity of the IPO market does not adversely affect our relationship and may report tempered results (Ritter & Welch, 2002). The goal of this study is to analyze how issue proceeds are allocated in investments that contain growth option value which we expect to be particularly prevalent during a period of economic expansion.

²⁹ IPO firms are required to update their registration statements filed with the SEC when important changes are made. Therefore, we only considered the latest registration statements prior to the IPO date to ensure that the information retrieved from the files were as accurate as possible.

the Securities Exchange Act of 1933, all firms which intend to go public are required to publish a registration statement which should include information regarding the business situation, strategy as well as governance and ownership structure. Some researchers have raised concerns that an IPO prospectus may contain a potential positive information bias, for example with respect to management outlooks (e.g., Welbourne & Andrews, 1996). However, such a bias should not influence the findings of this study because information gathered from the IPO prospectus only consist of ownership and management information which we consider factual rather than subjective information.

Based on our merged data set, we exclude IPOs of firms in the financial services sector (Anderson et al., 2012). In addition, we manually cross-check each IPO year with the IPO filings and drop firms if financial information is not available for the first year of being public. This procedure allows us to capture a final number of 591 Initial Public Offerings with complete information³⁰.

4.2 Dependent variable

Our dependent variable, “growth opportunity (GO)”, represents a firm’s discretionary future growth opportunities which we define as the relative firm value attributable to future growth options. Myers (1977) suggests that the total value of a firm (V_{MA}) can be partitioned into two components which comprise of the value of total assets (V_{TA}) and the value of growth options (V_{GO}).

$$V_{MA} = V_{TA} + V_{GO} \quad (1)$$

The definition for the main dependent variable in this study follows Kester (1984) and Reuer and Tong (2010) and is similar to previous related work (e.g., Alessandri et al. 2007; Tong & Reuer, 2006; Brealey & Myers, 2000). We measure the value of growth options (V_{GO}) as the delta between the total market value (V_{MA}) and the value of total assets (V_{TA}), whereas the value of total assets is calculated as the capitalized value of

³⁰ In untabulated results, we compare the means of key firm characteristics between firms that were included and firms that were dropped from the final sample, respectively. We highlight that t-tests report no significant differences in mean ($p = n.s.$) with regards to growth option value, market value and total assets. The difference in mean for the amount of proceeds was significantly different at the 10% level.

the firm's current earnings using a 20% discount rate for our baseline model³¹. Initially, we use a 20% discount rate in our main analysis for construct clarity and to ensure consistency with prior research on real options theory (Reuer & Tong, 2010; Kester, 1984). In robustness tests, we use alternative discount rates to ensure model reliability (see Chapter 6).

Following Reuer and Tong (2010), we measure total market value as the sum of the market value of the common stock plus the book value of preferred stock plus the book value of its long-term debt at the end of a firm's fiscal year. Then, we calculate the main dependent variable, growth opportunity, as the value of growth options as a percentage of the firm's market value.

$$\begin{aligned} GO &= V_{GO}/V_{MA} = (V_{MA} - V_{TA}) / V_{MA} \\ &= [V_{MA} - \text{Current earnings} / \text{Discount rate}] / V_{MA} \end{aligned} \quad (2)$$

Notably, in our context of initial public offerings, an advantage of using this specific measurement is that the growth opportunity is scaled by the total market value of the newly public firm. Thereby, we can mitigate the direct influence of the capital infusion on accounting measures and isolate the proportion of capital that is attributable to growth option value.

4.3 Independent variable

The main independent variable in this study is labelled "IPO proceeds" measures the dollar proceeds obtained by an IPO firm. The variable is operationalized as the net number of shares offered to the public times the offering price (Higgins & Gulati, 2006)³². We use net number of shares offered because during a public offering, existing shareholders may intend to offer some of their existing shares to the public which are subsequently not available to the firm to invest in growth options. In particular, family owners

³¹ Following Reuer and Tong (2010), we calculate current earnings as the firm's net income at the end of the fiscal year.

³² In untabulated tests, we use a relative measure calculated as net proceeds divided by total market value. However, we did not find that our results improved when using a relative measure. We conjecture that the decision to allocate funds in growth opportunities after going public does not seem to depend on the overall market capitalization of the firm.

may intend to offer some of their existing shares to the public. In robustness tests, we hand-collect additional information in the IPO prospectus regarding shares offered by family owners and exclude cases where shares by family owners were offered to the public.

4.4 Moderator variables

Our regression analysis includes three moderator variables. First, we include a moderator variable labelled “family firm” which is operationalized as a composite index and takes the value of 1 if the founding family controls at least 5% of the firm and has at least one member of the family involved in the management after going public, and 0 otherwise (Gomez-Mejia et al., 2018; Chrisman & Patel, 2012; Villalonga & Amit, 2006). Notably, because we are interested in newly public (family) firms, in which family owners retain significant control, our measure focuses on family control that is retained after going public, i.e., post-IPO family control (Kotlar et al., 2017). To identify the founding families and its descendants in each firm, we hand-collect company history data from the IPO prospectus as well other external sources such as Bloomberg or Financial Times for each firm. We then calculate total family control as the sum of all equity holdings for each individual family member in the firm as disclosed in the ownership structure of the IPO prospectus. For firms with dual class structures, we calculate the sum of all voting rights for all family members divided by the sum of all voting rights in each firm across all share classes. We test alternative family firm definitions in robustness tests (see Chapter 6).

Second, we include a moderator for “technological uncertainty” to test the three-way interaction effects in Hypothesis 3. While technological uncertainty has been defined in different ways (e.g., Oriani & Sobrero, 2008; Folta & Miller, 2002), we distinguish between technological uncertainty implied in broader industries and technological uncertainty implied in business models as even within the same industry, the technological exposure of individual firms may vary. We aim to alleviate challenges of prior research that has proxied idiosyncratic technological uncertainty in firms with broader industry uncertainty (e.g., Tong & Reuer, 2010). Specifically, we use the Thomson

Reuters coding scheme and define a high-technology firm as 1 if the primary line of business is a high-technology business, and 0 otherwise (see Appendix B). Our distinction of idiosyncratic technological uncertainties is finer grained than other (e.g., SIC) industry classifications which allows us to simultaneously control for industry fixed effects in the regression models (Oriani & Sobrero, 2008; Certo et al., 2001).

Third, we include a moderator for “market uncertainty” to test the three-way interaction effects in Hypothesis 4. In our approach, we follow Oriani and Sobrero (2008) and Folta and O’Brien (2004) and operationalize market uncertainty as unpredictability of industry market demand, i.e., the degree to which the actual industry market demand diverges from predicted industry market demand. The idea is to proxy industry market uncertainty not by the mere volatility of an underlying measure (e.g., Folta & Miller, 2002; Folta, 1998) but rather by its predictability, so that industries with highly volatile but predictable market demand will still be considered low uncertainty environments. We conform to the approach introduced by Folta and O’Brien (2004) and obtain annual U.S. GDP output industry data to gauge market demand. We then run Generalized Autoregressive Conditional Heteroskedasticity (GARCH) models as introduced by Bollerslev (1986) on the individual time series of GDP output of every industry to estimate the conditional variance of market output within industries (see Appendix C for a detailed description).

4.5 Control variables

Research on real options theory suggests that growth option values in firms depend on three distinct factors, i.e., firm-specific factors, the macroeconomic environment as well as the industry (Tong et al. 2008; Tong & Reuer, 2006; Kester, 1984). To account for these potential influences, we accordingly use three sets of control variables related to firm characteristics, IPO characteristics as well as the broader environment of the firm.

In the first set of control variables, we include eight controls related to firm characteristics. First, we include “firm size” measured as the natural logarithm of the firm’s total assets (Alessandri et al., 2012; Tong & Reuer, 2007) because firm size can influence investment allocation decision and risk perceptions related to real options (Tong &

Reuer, 2007). Second, we include “firm leverage”, calculated as the total debt outstanding divided by total firm assets (Alessandri et al., 2012) to control for a firm’s risk profile. Third, “capital intensity” is measured as the natural logarithm of total capital expenditure relative to total sales (Tong & Reuer, 2007). Fourth, we include “firm age” measured as the difference between the financial year and the founding year of the firm (e.g., Alessandri et al., 2012). Fifth, following Tong et al. (2008), “organizational slack” is measured as the total selling, general and administrative expenses divided by total firm sales because organizational slack resources may reduce downside risks of real options (Bowman & Hurry, 1993). Sixth, the model controls for the effects of “liquidity” which is operationalized as the delta between the current assets and the current liabilities divided by total assets, following Reuer and Tong (2010). Seventh, we include “acquisitions”, measured as the annual investments allocated to mergers and acquisitions to account for a firm’s propensity to invest in new markets and businesses (Ragozzino & Reuer, 2011). Eighth, we also account for investments into research and development prior to going public as existing commitments into R&D may affect how new funds are allocated to projects after going public (Hurry et al., 1992). We operationalize the control “pre-IPO R&D expenditure” as the average annual expenses in R&D for the two years prior to going public. All control vectors in the first set of controls are calculated using financial information at the end of a firm’s fiscal year.

In the second set of variables, we include two control variables related to IPO characteristics. First, a categorical variable “IPO lead underwriter” is included to account for differences in the quality of IPO lead underwriters which potentially have an influence on investor decisions (Higgins & Gulati, 2006). Second, the categorical variable “type of IPO security” measures potential differences of the type of share issued on the use funding.

Lastly, in the third set, we include year fixed-effects to account for the macroeconomic environment as well as industry fixed-effects to rule out influences driven by industry-specific factors.

4.6 Analytical model

To test the hypotheses, we employ a two-way OLS fixed-effects panel data estimation approach using moderated hierarchical multiple regressions. To control for serial correlation and heteroscedasticity we use Huber-White sandwich estimators clustered at the industry level. We winsorize our continuous variables at the 1st and 99th percentile to reduce the potential influence of outliers. Since we include three-way interaction effects in the regression models, multicollinearity might pose a problem (Levitas & Chi, 2010). However, since two moderators are dichotomous variables, we do not expect this to be an issue. Nevertheless, in untabulated results, we test the robustness of our models by centering continuous variables that are part of the interaction equations and note that the results remain economically and statistically stable³³. Given that we are interested in the significance of interaction effects in our models, we follow Folta & O'Brien (2004) and compare the model fits using a likelihood ratio test with a base model that excludes interaction effects. In the robustness section (see Chapter 6), we address endogeneity concerns and test the hypotheses using a Propensity Score Matching approach in a separate model.

5 RESULTS

Table 1 provides the descriptive statistics of the variables included in the regression analysis for 591 IPO firms in our sample. The mean growth option value is 0.97. We note that our result is comparable to studies focusing on newly public firms (Reuer & Tong, 2010) as newly public firms typically contain high levels of growth option value (Schwartz & Moon 2000, Loughran & Ritter, 2004). Importantly, Reuer and Tong (2010) note that growth option value can be both “[...] negative or greater than one, depending on a firm’s investments in future growth opportunities and its current profitability (p. 207)”, so that our measure of growth option value is not capped at the value of 1. The mean growth option value for newly public family firms is 0.99, compared to

³³ In addition, while not reported, we compute the variance inflation factors (VIF) and find that the mean VIF does not exceed the threshold of 4 for none of the models (O'Brien, 2007), even with the simultaneous inclusion of all uncentered interaction terms.

a mean of 0.96 for newly public nonfamily firms, with the difference in mean being statistically significant ($p < 0.05$). The average firm in our sample raised 178.46 mUSD. Family firms raised on average 140.60 mUSD in proceeds from going public, which is significantly less ($p < 0.001$) compared to nonfamily firms which raised 200.45 mUSD on average. Family firms comprise 37% of all firm-year observations (219 unique family firms) in our IPO sample, which is comparable to findings from other studies on U.S. family firms (e.g., Villalonga & Amit, 2006). Regarding firm characteristics, we find that newly public family firms are significantly smaller ($p < 0.001$), less leveraged ($p < 0.001$) and younger ($p < 0.001$), compared to newly public nonfamily firms. However, we note that newly public family firms report significantly more organizational slack ($p < 0.001$) but lower liquidity ($p < 0.001$), compared to newly public nonfamily firms.

[insert Table 1 about here]

Table 2 provides detailed information regarding family ownership and managerial involvement in family firm IPOs. Before going public, founding families held on average 36.08% family control whereas post-IPO family control was 27.36%. In the family firm subsample, 33.70% of all family firms offered part of their existing family shares to outside shareholders. Furthermore, at the time of going public, on average 1.70 family members were employed in the active management of the family firm which translates into 16.74% of all management positions. On average, family members held 1.43 (1.26) seats as directors (executives) which is equal to 22.07% (22.36%) of all director (executive) seats. Our findings corroborate existing research on board composition in U.S. listed family firms (Anderson & Reeb, 2004).

[insert Table 2 about here]

Table 3 reports the results from the regression models to examine the effects of IPO proceeds on growth option value and the contingencies of family firm presence and exogenous uncertainty. Model I reports the baseline specification that only includes the control variables. Model II adds the main independent variable capital raised and Models

III and IV introduce the moderation and the three-way interaction term, respectively. All four models are highly significant ($p < 0.001$). In comparison to our baseline Model I, Model II-IV all exhibit significant increases in explanatory power, using likelihood ratio tests (Folta & O'Brien, 2004).

Hypothesis 1 tests the prediction that the amount of IPO proceeds will be positively associated with the growth option value of newly public firms. Table 3 reports that the direct effect of proceeds received on growth option value is positive and significant ($p < 0.01$ in Model II) providing empirical support for Hypothesis 1. Our finding indicates that the more funds are available to a firm the higher a firm's growth option value becomes. Economically speaking, our results show that by raising 1mUSD, the growth option value increases by 0.024 percentage points. Given that on average, IPO firms raised 178.46mUSD, the effect appears to be economically meaningful.

Hypothesis 2 proposes that the positive relationship between IPO proceeds and growth option value will be stronger in family firms, compared to nonfamily firms. Model II shows that the interaction effect between proceeds received and family firm is positive and significant ($p < 0.05$). The result confirms our hypothesis and suggests that, given a certain level of capital received from going public, the growth option value in family firms becomes more valuable, compared to nonfamily firms. In economic terms, our results suggest that by raising 1mUSD, the growth option value in newly public family firms increases by 0.015 percentage points more, compared to newly public non-family firms.

Lastly, Hypothesis 3 and Hypothesis 4 predict that the positive influence of family firm presence on the relationship between IPO proceeds and growth option value will be stronger for family firms in high-uncertainty environments (technological uncertainty for H3 and market uncertainty for H4). For Hypothesis 3, the three-way interaction effect between IPO proceeds, family firm and technological uncertainty is positive and significant in Model IV ($p < 0.05$). For Hypothesis 4, three-way interaction effect between IPO proceeds, family firm and market uncertainty is also positive and significant in Model V ($p < 0.01$). Conceding to our theoretical predictions, the results overall corroborate that the positive influence of family firm presence on growth option value is more pronounced in environments underlying high exogenous uncertainty.

Several results for the main effects and control variables are also worth noting. First, consistent with the theoretical predictions from real options theory, we find that the direct effects of technological and market uncertainty on growth option value are positive, however not significant ($p=n.s.$). Regarding control variables, the results show that firm size has a significantly negative effect on growth option value, consistent with prior research (e.g., Alessandri et al., 2012). Furthermore, capital intensity and organizational slack have a significantly positive effect on growth option value in newly public firms, while leverage positively influences the growth option value in newly public firms. Lastly, we note that the industry fixed effects are jointly significant, supporting previous research which found that industry factors play an important role in determining growth option value (Kester, 1984). Year fixed-effects are also jointly significant suggesting that economy-wide factors affect growth option value. These findings are overall supportive of prior research (e.g., Tong et al., 2008).

[insert Table 3 about here]

6 ROBUSTNESS

To test the robustness of our results, we conduct several auxiliary analyses. First, we use an alternative estimation method. Given our focus on family firms which tend to be smaller than nonfamily firms and may be present in different industries (Villalonga & Amit, 2006; Anderson & Reeb, 2004), our findings may be influenced by systematic differences between family firms and nonfamily firm characteristics, potentially resulting in unobserved heterogeneity and thus endogeneity. To partially alleviate such endogeneity problems, we additionally run Hypothesis 1 to Hypothesis 4 on a matched sample. To match our sample, we use a Propensity Score Matching (PSM) approach which has been used previously in management and family firm research (see e.g., Bird & Zellweger, 2018; Neckebrouck et al., 2018). PSM lowers the influence of unobserved heterogeneity which provides us with more conservative estimates and reduces the risk of having a systematic bias that may be present in the dataset (Dehejia & Wahba, 2002). We follow Neckebrouck et al. (2018) and employ a propensity-matched pair design of

family and nonfamily firms without replacements. We therefore use a set of covariates that matches family firms with nonfamily firms with the closed propensity scores. For our set of covariates, we include firm age, firm size, capital intensity, industry and year. Notably, we match firm-years instead of firms because the goodness of a match between family and nonfamily firms may vary during the observation period (Neckebrouck et al., 2018; Dehejia & Wahba, 2002). Such an approach further reduces the probability of systematic biases in our sample. We then calculate propensity scores and match family firms with its closest (nonfamily) neighbor based on their propensity scores. Because we apply a propensity score matching without replacement, our dataset is reduced to 1'626 firm-year observations (813 family firm-year observations and 813 nonfamily firm-year observations). Table 4 provides the results of the balancing tests of covariates prior to matching (Panel A) and after matching (Panel B), respectively. Panel A in Table 4 shows that there are significant differences in mean of firm age and firm size between family and nonfamily firms prior to matching. After matching, Panel B in Table 4 reports that the t-tests for the means of family and nonfamily firms of all covariates become insignificant. While not reported in Table 4, we also match our sample based on industry and year.

[insert Table 4 about here]

Based on the matched sample which includes 1'626 firm-year observations, we rerun the two-way fixed effects OLS regression with cluster-robust standard errors for Hypothesis 1 to Hypothesis 4. Table 5 reports that our results remain similar when using the balanced sample, except for Hypothesis 4, where, contrary to our expectations, we find no statistical support in the matched sample.

[insert Table 5 about here]

Second, we test whether our results also hold for other types of powerful blockholders which are not founding families. Initially, we have conjectured that family owners may allocate substantial parts of their IPO proceeds into valuable growth options.

However, this argument may also hold true for other influential blockholders since, after going public, more funds are available which can be invested in long-term projects. Because stock ownership is aligned with the payoff structure of growth options (Alessandri et al., 2012), powerful nonfamily blockholders may also display a higher propensity to invest in such projects. Concurrently, nonfamily blockholders tend to apply a more short-term investment horizon, particularly after going public (Bruton et al., 2010; Lee & O'Neill, 2003) which should temper their propensity to invest proceeds in long-term projects with future, uncertain payoffs. To test whether family owners are a distinct group of firm owners (or blockholders) who invest a significant part of their available funds into growth options after going public, we use institutional blockholder influence as a counterfactual condition. While our original dataset does not allow us to directly identify nonfamily blockholders, we draw on Thomson Reuter's Institutional 13F Holdings database for institutional ownership (e.g., Connelly et al., 2017; Zorn et al., 2017). The database contains U.S. stocks holdings by institutional investment managers, such as hedge funds and asset managers, with a cumulative investment discretion of at least 100 mUSD. For our analysis, we use a 5% ownership threshold to determine whether an individual institutional investor has substantial influence over the firm (Anderson & Reeb, 2004)³⁴. First, we use a dichotomous variable that equals 1 if at least one 5% institutional blockholder was present in any given firm and year, and zero otherwise. Second, we use a continuous variable that measures the cumulative equity ownership of all 5% institutional investors in a given firm and year. The results in Table 6 report that we do not find any of the predicted significant influence of institutional investor presence on the relationship between IPO proceeds and growth option value, neither when using a dichotomous (Model I-III) nor a continuous (Model IV-IV) variable³⁵. In fact, institutional ownership appears to have a deleterious effect on the relationship between IPO proceeds and growth opportunities, although the relationship is insignificant.

[insert Table 6 about here]

³⁴ We also run our regressions using a 10% and 25% threshold and our results remain similar.

³⁵ In untabulated results, we run our regressions on institutional blockholder ownership using a Propensity Score Matching approach and find that our results remain similar.

Third, we test the robustness of our results using alternative definitions of a family firm. Initially, we followed contemporary family business research and defined a family firm as a firm where the founding family controls at least 5% of the firm and has at least one member of the family involved in the management at the time of the IPO, and 0 otherwise (e.g., Gomez-Mejia et al., 2018). To ensure robustness, we alternate this definition and apply two alternative family firm definitions. First, we use a threshold of 15% of family control with at least one member of the family being involved in the management at the time of the IPO. Second, we use a continuous measure of the family firm. Specifically, we multiply post-IPO family control with a dichotomous variable, defined as 1 if the management board consists of at least one family member, and 0 otherwise. Thus, for our continuous measure, we still require family management presence for a firm to be considered a family firm. Table 7 reports that for both our alternative dummy measure (Model I to III) as well as for our continuous measure (Model IV to VI), our findings remain similar.

[insert Table 7 about here]

Fourth, we test alternative measures of growth option value. Following Reuer and Tong (2010) and Kester (1984) we used a discount rate of 20% to capitalize current earnings. To corroborate our findings, we use two sets of alternative measures. First, we recalculate growth option values by applying a discount rate of 15% as in Reuer and Tong (2010)³⁶. Second, while we are unable to obtain reliable WACC data on the individual firm-level, we use a dataset from NYU Stern School of Business that contains industry-level average cost of capital in the United States³⁷. As the cost of capital in part depends on the industry, firms are embedded in (e.g., Elton & Gruber, 1971), we aim to ameliorate the effects of potentially confounding industry-specific factors. We match the industry average WACC with each individual firm based on their respective SIC industry classification to account for potential variation of cost of capital between different industries in the United States. Table 8 reports that our results remain similar when using

³⁶ In untabulated tests, we apply a discount rate of 10% and 25% and find that our results remain similar.

³⁷ WACC is calculated as $[(MV_{Equity}/(MV_{Equity}+MV_{Debt})) * r_{Equity} + (MV_{Debt}/(MV_{Equity}+MV_{Debt})) * (r_{Debt} * 1 - Tax)]$.

either an alternative discount rate (Model I-III) or an industry-level WACC (Model IV-VI)³⁸. When using a discount rate of 15% and an industry-level WACC, the median growth option value decreases to 0.93 and 0.87, respectively.

[insert Table 8 about here]

Fifth, we empirically address an assumption in our theoretical framework. In our model, we assume that the proceeds from a public offering remain in the firm which then can be invested in profitable projects and growth opportunities the IPO. However, in the case of family firms, it is possible that parts of the proceeds are being used to pay back shareholders in case they have offered some of their own shares to the public as part of the public offering process. As a result, less funds would be available to be invested which may distort the interpretation of our results. We thus hand-collect additional information regarding shares offerings of existing family shareholders in family firm IPOs during the IPO process. In untabulated results, we test the robustness of our results by excluding family firm IPOs where family owners offered shares to the public during the IPO and our results remain similar. Furthermore, family firms may decide to go public as a means to exit the firm (Kotlar et al., 2017), a decision which potentially avertedly affects a firm's propensity to invest proceeds in growth opportunities. However, since our focus is on family firms that retain ownership and remain in the firm management (Kotlar et al., 2017; Leitterstorf & Rau, 2014), this alternative motivation to go public should not be of concern in our study. Lastly, our data does not allow us to discern actual investment decisions in newly public firms and we thus assume equal discretionary investment opportunities in growth options of all firms. It might however be that some newly public firms have less discretion and managerial freedom to invest in growth projects than others. While we do not expect systematic differences between newly public family and newly public nonfamily firms regarding discretionary

³⁸ In an attempt to gauge firm-level WACC, we adjust the industry-level WACC for firm leverage within each industry cluster, ceteris paribus. Our results remain significant at the 5% level or better, except for H2 which falls beyond the 5% level. However, our data does not allow us to discern the market values of debt for each individual firm which compromises the validity of a meaningful firm-level WACC. Therefore, we use an industry-level WACC to ensure robustness of our main results.

investment opportunities, which is of key interests in our study, in untabulated tests, we rerun our hypotheses with a subsample of firms that had a positive liquidity at the time of the public offering. Our idea is that firms with negative liquidity may be more financially constrained with respect to their investment behavior and thus have less managerial investment flexibility to invest in growth opportunities after a public offering, which could confound our results. We find that our results remain similar. Overall, while causation may be a potential concern in every empirical study, we have little reason to believe that our study suffers from such concerns more than any other study, given that we use longitudinal data which is more efficacious in drawing causal inferences (Neckebrouck et al., 2018) and that we use alternative estimation methods, control for several alternative explanations and various confounding effects in our robustness tests.

Sixth and lastly, we test the robustness of our results by altering specifications in our model. For example, regarding our set of control variables, we use alternative definitions of leverage and firm size and a natural logarithm of firm age. We also winsorize our key dependent and independent variables at the 5th and 95th percentile of their distributions. We further change the specifications of our standard errors by clustering them using different definitions of industry-levels as well as on the industry-year level. We also include a dummy variable to account for the effects of dual class structure on growth opportunities. We find that our results remain similar when altering these specifications in our model.

7 DISCUSSION

Investments in growth opportunities are important for firms to create sustainable, long-term firm value (Reuer & Tong, 2005; Myers, 1977). In particular, Initial Public Offerings are an opportune situation for newly public firms to use cash proceeds to finance growth projects and growth opportunities (Reuer & Tong, 2010; Certo et al., 2009). In the context of public offerings, we investigate the investment behavior of newly public family firms. Family firms that decide to go public are often confronted with a trade-off between economic and noneconomic considerations (Kotlar et al., 2017; Leitterstorf & Rau, 2014). On the one hand, newly public family firms - like any other firm - gain

access to capital to finance growth opportunities and commit to future investments. On the other hand, going public also implies a change in ownership structure (Kotlar et al., 2017), increased monitoring and disciplining efforts by regulators (Pagano et al., 1998) and increased visibility and reputational risks (Hsu et al., 2010) or a dilution of family control (Leitterstorf & Rau, 2014). Exploring the balancing act of financial and socioemotional interests in family firms (e.g., Gomez-Mejia et al., 2018; Kotlar et al., 2017), literature suggests that family firms tend to avoid socioemotional losses (i.e., a loss aversion towards socioemotional wealth) at the expense of financial wealth. We build on work by Kotlar et al. (2017) and Leitterstorf & Rau (2014) and analyze this trade-off in the context of Initial Public Offerings. Our central thesis is that when family firms go public, they may accept a loss of socioemotional wealth but invest more of the proceeds into real options that contain growth opportunities and create future firm value to financially compensate for their loss of socioemotional wealth. Our arguments are grounded on real options theory (Myers, 1977; Miller & Modigliani, 1961), suggesting that investments in growth options are contingent on managerial discretion and foresight (Alessandri et al., 2012; Adner & Levinthal, 2004). Thereby, going public offers firms an opportunity to actively invest the available funds into projects that contain future, unrealized growth potential and to create sustainable firm value at the discretion of the firm's management. Our study has three findings. First, we find that the proceeds received during a public offering is positively associated with growth option value, corroborating real options theory's predictions (Reuer & Tong, 2010). Second, we find that family firms positively moderate the relationship between IPO proceeds and growth option value in newly public firms. Because family owners tend to hold substantial equity stakes and display long-term investment horizons (Anderson & Reeb, 2003a), their incentives are aligned with the payoff structure of real options (Alessandri et al., 2012), providing them with an opportunity to compensate for their loss of socioemotional wealth after going public. Third, the findings show that technological and market uncertainty increases a family firm's propensity to invest in real options that contain valuable growth opportunities. While investments under uncertainty can become more valuable to the family firm, the riskiness of such investment also increases (Levitas & Chi, 2010; Adner & Levinthal, 2004). Our results speak to risk preferences of family firms (Gomez-

Mejia et al., 2007) and indicate that in highly uncertain environments, family firms may invest more funds into growth options after a public offering than family firms which are active in low uncertainty environments.

This study offers several implications for management research in general and family business literature in specific. First, we offer a potential explanation of a family firm's rationale to go public and aim to explain why family firms may accept a loss of noneconomic wealth as they decide to go public (Kotlar et al., 2017; Leitterstorf & Rau, 2014). Research provides evidence that family firms forgo financial benefits to preserve nonfinancial wealth, such as family control (Gomez-Mejia et al., 2018; Chrisman & Patel, 2012). Our study suggests that while family firms may accept a loss of personal, noneconomic wealth at the time of going public, they may alternate their focus once public to focus on future financial wealth as a means to compensate for their socioemotional loss. We portend to research on newly public family firms such as by Kotlar et al. (2017) and Leitterstorf and Rau (2014) to provide insights how family firms may compensate a loss of socioemotional wealth with future financial wealth after going public. Our study also relates to work by Wasserman (2017; 2006) suggesting that founders in startups tend to be reluctant to surrender control when tasked to raise new venture capital to ensure future financial success. Such work is emblematic to the notion that family owners face a distinct trade-off between economic and noneconomic goals. While we focus on more matured family firms, investigate firms in which family owners retain significant control after going public (Kotlar et al., 2017) and delineate circumstances under which family owners are confronted with a broader set of noneconomic loss considerations, our study ties to ideas by Wassermann (2017, 2006), highlighting the challenging environment for founders and family owners when deciding how to sustainably grow their businesses under noneconomic wealth and founder control considerations. Second, we offer an empirical contribution to real options theory. While theory suggests that strategic investment allocation in real options largely depends on managerial skills and foresight (Adner & Levinthal, 2004; Kester, 1984), empirical research on how management and organizational firm heterogeneity affect growth opportunities is scarce (for one exception, see Alessandri et al. (2012)). Our study thus directly builds on calls from Adner and Levinthal (2004) and research from Alessandri et al. (2012). By identifying

and analyzing a distinct organizational form, namely the family firm, we offer new insights on the important role of firm heterogeneity in growth option value and exemplify how organizational context can influence growth option value. To the best of our knowledge, this study is the first to apply a real options logic in a family firm context. Third, we contribute to real options literature in IPO firms (e.g., Reuer & Tong, 2010) by focusing on growth opportunities around Initial Public Offerings. While literature suggests that firms go public to invest in profitable projects and commit to growth initiatives (Certo et al., 2009), we use real options theory and provide empirical evidence that suggesting that IPOs provide firms with an opportunity to assess their strategic investment allocation and to use the capital infusion to invest in real options that potentially create firm value in the future. Our findings thereby buttress the notion that public offerings may be an important source for firms to capture valuable growth options (Reuer & Tong, 2010). Fourth, the findings also highlight potential challenges of accurately capturing post-IPO outcomes in general (Certo et al., 2009) and for family firms as our study indicates that family firms may allocate substantial portions of their funds into real options. By emphasizing investments in future growth options after going public, firms may refrain from focusing on maintaining a high stock price and maximizing short-term cash flows (Kester, 1984). The findings imply that (short-term) market performance might not be the only accurate measurement to capture firm behavior and performance outcomes in newly public family firms.

Our study also provides practical implications for managers. For example, it highlights the importance of using an IPO as an opportunity to invest proceeds in projects that entail a future, uncertain payoff. While newly public firms are often pressurized to apply a more short-term horizon and immediately maximize profits (Lee & O'Neil, 2003), our study indicates that there may be merit for firms to use the proceeds for investments in uncertain, longer-term projects that do not offer an immediate payout. In addition, our results reveal that a firm's growth option value can be significantly influenced at the firm level and may indeed depend on its organizational context (Alessandri et al., 2012; Adner & Levinthal, 2004). Notably, while managers' investment decisions are an important determinant of growth option value (Adner & Levinthal, 2004), our study suggests that it can be particularly crucial in the case of newly public firms.

Finally, our study highlights some conditions under which such investments can be particularly important for managers of newly public firms. For instance, when firms are exposed to uncertain technological and market environments, managerial investment decisions are particularly crucial as investments in growth options can become more valuable to the firm. Our results underscore the notion that the managerial decision to invest in real options does depend not only on the organizational context, but that that a firms' environmental circumstances should be considered simultaneously (Belderbos et al., 2019; Levitas & Chi, 2010).

This study, like any other, has its limitations that hopefully open avenues for future research. First, while our measurement of growth opportunities is consistent with existing research (e.g., Alessandri et al., 2012; Reuer & Tong, 2010), our data does not allow us to discern growth option values of specific investments in real options (e.g., Fisch & Zschoche, 2012; Tong et al., 2008). Rather, by developing a theoretical framework, we aim to draw inferences how newly public firms may allocate funds into real options by analyzing overall firm growth option value. Future research could focus on how investments in specific projects differ between newly public family firms and newly public nonfamily firms, for example investments in joint ventures or corporate venture capital. This may allow research to depict a more nuanced picture of how family firms create growth opportunities in the context of IPOs. Second, our sample only consists of U.S. firms which may limit the generalizability of the findings. Future research may seek to investigate whether the findings also apply to other markets and contexts or certain industries (Levitas & Chi, 2010; Hurry et al., 1992). Third, we do not directly measure the influence of family presence on growth opportunities in family firms but assume that founding families have sufficient power and ability to influence strategic decision-making in family firms. While our approach is consistent with existing family business literature (e.g., Gomez-Mejia et al., 2018; Kotlar et al., 2017) and we use alternate definitions to ensure robustness, future research may develop more direct measures to study investment decision processes in newly public family firms. Forth, our data does not allow us to calculate the WACC for each individual firm because such data is typically proprietary. We therefore use different discount rates as in Reuer and Tong (2010) and an industry-level WACC to ameliorate concerns over our dependent variable. As family

firms may have distinct preferences with regards to capital structure (e.g., Zellweger, 2007; Anderson & Reeb, 2003b), future research may gain additional insights by exploring growth option values in family firms with firm-level WACC data.

8 CONCLUSION

Using a real options perspective, we investigate whether the proceeds received from going public fosters growth opportunities in family firms. Contributing to family business research that explores trade-offs between economic and noneconomic interests in family firms (Gomez-Mejia et al., 2018; Kotlar et al., 2017; Leitterstorf & Rau, 2014), we conjecture that while family owners often accept a loss of noneconomic wealth after going public, they may compensate for this loss by investing in real options that can maximize future wealth outcomes. In addition, our findings contribute to real options theory by highlighting distinct sources of firm heterogeneity in growth option value (Alessandri et al., 2012; Adner & Levinthal, 2004) as well as illuminating the importance of growth option value in newly public firms (Reuer & Tong, 2010).

References

- Acharya, A.G. & Pollock, T.G. (2013). Shoot for the Stars? Predicting the Recruitment of Prestigious Directors at Newly Public Firms. *The Academy of Management Journal* **56**(5): 1396–1419.
- Adner, R. & Levinthal, D. (2004). What is not a real option: Considering boundaries for the application of real options to business strategy. *Academy of Management Review* **29**: 74–85.
- Alessandri, T.M., Lander, D.M. & Bettis, R.A. (2007). Strategic implications of valuation: Evidence from valuing growth options. *Advances in Strategic Management* **24**: 473–499.
- Alessandri, T.M., Tong, T.W. & Reuer, J.J. (2012). Firm heterogeneity in growth option value: The role of managerial incentives. *Strategic Management Journal* **33**: 1557–1566.
- Anderson, R.C. & Reeb, D.M. (2003a). Founding-Family ownership and Firm Performance: Evidence from the S&P 500. *The Journal of Finance* **63**: 1301–1328.
- Anderson, R.C. & Reeb, D.M. (2003b). Founding-family ownership, corporate diversification and firm leverage. *Journal of Law & Economics* **46**(2): 653–680.
- Anderson, R.C. & Reeb, D.M. (2004). Board Composition: Balancing Family Influence in S&P 500 Firms. *Administrative Science Quarterly* **49**(2): 209–237.
- Anderson, R.C., Reeb, D.M. & Zhao, W. (2012). Family-Controlled Firms and Informed Trading: Evidence from Short Sales. *The Journal of Finance* **67**(1): 351–385.
- Belderbos, R., Tong, T.W. & Wu, S. (2019). Multinational investment and the value of growth options: Alignment of incremental strategy to environmental uncertainty. *Strategic Management Journal* **40**(1): 127–152.
- Bird, M. & Zellweger, T.M. (2018). Relational embeddedness and firm growth: Comparing spousal and sibling entrepreneurs. *Organization Science* **29**(2): 264–283.
- Bollerslev, T. 1986. Generalized autoregressive conditional heteroscedasticity. *Journal of Econometrics* **31**: 307–327.
- Bowman, E.H. & Hurry, D. (1993). Strategy through the options lens: An integrated view of resource investments and the incremental-choice process. *Academy of Management Review* **18**: 760–782.
- Brealey, R.A. & Myers, S.C. (2000). *Principles of Corporate Finance* (6th ed). Boston, MA: Irwin/McGraw-Hill.
- Bruton, G., Filatotchev, I., Chahine, S. & Wright, M. (2010). Governance, ownership structure and performance of IPO firms: the impact of different types of private equity investors and institutional environments. *Strategic Management Journal* **31**: 491–509.
- Certo, S.T., Daily, C.M. & Dalton, D.R. (2001). Signalling firm value through board structure: an investigation of initial public offerings. *Entrepreneurship Theory & Practice* **26**: 33–50.

- Certo, S.T., Holcomb, T.R. & Holmes, R.M. (2009). IPO research in management and entrepreneurship: Moving the agenda forward. *Journal of Management* **35**(6): 1340–1378.
- Chadwick, C., Guthrie, J. & Xing, X. (2016). The HR executive effect on firm performance and survival. *Strategic Management Journal* **37**(11): 2346–2361.
- Chrisman, J.J. & Patel, P.C. (2012). Variations in R&D investments of family and non-family firms: Behavioral agency and myopic loss aversion perspectives. *The Academy of Management Journal* **55**: 976–997.
- Coles, J.L., Daniel, N.D. & Naveen, L.N. (2006). Managerial incentives and risk-taking. *Journal of Financial Economics* **79**: 431–468.
- Connelly, B.L., Shi, W. & Zyung, J. (2017). Managerial response to constitutional constraints on shareholder power. *Strategic Management Journal* **38**: 1499–1517.
- Daily, C.M., Dalton, D.R. & Cannella Jr., A.A. (2003) Corporate Governance: Decades of Dialogues and Data. *Academy of Management Review* **28**: 371–398.
- Dehejia, R.H. & Wahba, S. (2002). Propensity score-matching methods for nonexperimental causal studies. *Review of Economics and Statistics* **84**(1): 151–161.
- Dixit, A.K. & Pindyck, R.S. (1994). *Investment under uncertainty*. Princeton, NJ: Princeton University Press.
- Elton, E.J. & Gruber, M.J. (1971). Valuation and the Cost of Capital for Regulated Industries. *The Journal of Finance* **26**(3): 661–670.
- Fama, E.F. & French, K.R. (2004). New lists: Fundamentals and survival rates. *Journal of Financial Economics* **73**(2): 229–269.
- Fisch, J.H. (2008). Investment in new foreign subsidiaries under receding perception of uncertainty. *Journal of International Business Studies* **39**: 370–386.
- Fisch, J.H. & Zschoche, M. (2012). The role of operational flexibility in the expansion of international production networks. *Strategic Management Journal* **33**(13): 1540–1556.
- Fischer, H.M. & Pollock, T.G. (2004). Effects of social capital and power on surviving transformational change: The case of initial public offerings. *The Academy of Management Journal* **47**(4): 463–481.
- Folta, T.B. (1998). Governance and uncertainty: The tradeoff between administrative control and commitment. *Strategic Management Journal* **19**: 1007–1028.
- Folta, T.B. & Miller, K.D. (2002). Real options and equity partnerships. *Strategic Management Journal* **23**: 77–88.
- Folta, T.B. & O'Brien, J.P. (2004). Entry in the presence of dueling options. *Strategic Management Journal* **25**(2): 121–138.
- Gomez-Mejia, L., Patel, P. & Zellweger, T. (2018). In the Horns of the Dilemma: Socioemotional Wealth, Financial Wealth, and Acquisitions in Family Firms. *Journal of Management* **44**(4): 1369–1397.
- Gomez-Mejia, L.R., Haynes, K., Nunez-Nickel, M., Jacobson, K.J.L. & Moyano-Fuentes, J. (2007). Socioemotional wealth and business risks in family-controlled firms: evidence from Spanish olive oil mills. *Administrative Science Quarterly* **52**(1): 106–137.

- Higgins, M.C. & Gulati, R. (2006). Stacking the deck: The effects of top management backgrounds on investor decisions. *Strategic Management Journal* **27**: 1–25.
- Hsu, H., Reed, A.V. & Rocholl, J. (2010). The new game in town: competitive effects of IPOs. *The Journal of Finance* **65**(2): 495–528.
- Hurry, D., Miller, A.T. & Bowman, E.H. (1992). Calls on high-technology: Japanese exploration of venture capital investments in the United States. *Strategic Management Journal*, **13**: 85–101.
- Kester, W.C. (1984). Today's options for tomorrow's growth. *Harvard Business Review* **62**(2): 153–160.
- Kogut, B. & Kulatilaka, N. (1994). Options thinking and platform investments: Investing in opportunity. *California Management Review* **36**: 52–71.
- Kogut, B. (1991). Joint ventures and the option to expand and acquire. *Management Science* **37**: 19–33.
- Kogut, B. & Kulatilaka, N. (2001). Capabilities as real options. *Organization Science* **12**(6): 744–758.
- Kotlar, J., Signori, A., De Massis, A. & Vismara, S. (2017). Financial Wealth, Socio-emotional Wealth and IPO Underpricing in Family Firms: A Two-Stage Gamble Model. *The Academy of Management Journal* **61**(3): 1073–1099.
- Kulatilaka, N. & Perotti, A. (1998). Strategic growth options. *Management Science* **44**: 1021–1031.
- Leiblein, M.J. (2003). The Choice of Organizational Governance Form and Performance: Predictions from Transaction Cost, Resource-based, and Real Options Theories. *Journal of Management* **29**(6): 937–961.
- Leitterstorf, M.P. & Rau, S.B. (2014). Socioemotional wealth and IPO underpricing of family firms. *Strategic Management Journal* **35**(5): 751–760.
- Levitas, E. & Chi, T. (2010). A look at the value creation effects of patenting and capital investment through a real options lens: The moderating role of uncertainty. *Strategic Entrepreneurship Journal* **4**: 212–233.
- Loughran, T. & Ritter, J.R. (2004). Why Has IPO Underpricing Increased Over Time? *Financial Management* **33**: 5–37.
- Lungeanu, R. & Zajac, E.J. (2016). Venture capital ownership as a contingent resource: How owner-firm fit influences IPO outcomes. *The Academy of Management Journal* **59**(3): 930–955.
- McGrath, R.G., Ferrier, W.J., & Mendelow, A. L. (2004). Real options as engines of choice and heterogeneity. *Academy of Management Review* **29**(1): 86–101.
- McGrath, R.G. & Nerkar, A. (2004). Real options reasoning and a new look at the R&D investment strategies of pharmaceutical firms. *Strategic Management Journal* **25**: 1–21.
- Miller, M. & Modigliani, F. (1961). Dividend policy, growth and the valuation of shares. *Journal of Business* **34**: 411–433.
- Myers, S.C. (1977). Determinants of corporate borrowing. *Journal of Financial Economics* **5**: 147–175.

- Neckebrouck, J., Schulze, W. & Zellweger, T. (2018). Are Family Firms Good Employers? *The Academy of Management Journal* **61**(2): 553–585.
- Nelson, T. (2003). The persistence of founder influence: Management, ownership, and performance effects at initial public offering. *Strategic Management Journal* **24**: 707–724.
- O'Brien, R. (2007). A caution regarding rules of thumb for variance inflation factors. *Quality and Quantity* **41**: 673–690.
- Oriani, R. & Sobrero, M. (2008). Uncertainty and the market valuation of R&D within a real options logic. *Strategic Management Journal* **29**(4): 343–361.
- Pagano, M., Panetta, F. & Zingales, L. (1998). Why do companies go public? An empirical analysis. *The Journal of Finance* **53**: 27–64.
- Ragozzino, R. & Reuer, J.J. (2011). Geographic distance and corporate acquisition: Signals from IPO firms. *Strategic Management Journal* **32**: 876–894.
- Reuer, J.J. & Leiblein, M.J. (2000). Downside risk implications of multinationality and international joint ventures. *The Academy of Management Journal* **43**: 203–214.
- Reuer, J.J. & Tong, T.W. (2005). Real Options in International Joint Ventures. *Journal of Management* **31**(3): 403–423.
- Reuer, J.J. & Tong, T.W. (2010). Discovering Valuable Growth Opportunities: An Analysis of Equity Alliances with IPO Firms. *Organization Science* **21**(1): 202–215.
- Ritter, J. & Welch, I. (2002). A review of IPO activity, pricing, and allocations. *The Journal of Finance* **57**(4): 1795–1828.
- Schulze, W.S., Lubatkin, M.H. & Dino, R.N. (2003). Toward a theory of agency and altruism in family firms. *Journal of Business Venturing* **18**(4): 473–490.
- Schwartz, E.S. & Moon, M. (2000). Rational pricing of Internet companies. *Financial Analysts Journal* **56**(3): 62–75.
- Smit, H.T. & Trigeorgis, L. (2004). *Strategic Investment: Real Options and Games*. Princeton University Press: Princeton, NJ.
- Tong, T.W. & Li, Y. (2011). Real Options and Investment Mode: Evidence from Corporate Venture Capital and Acquisition. *Organization Science* **22**(3): 659–667.
- Tong, T.W. & Li, S. (2013). The assignment of call option rights between partners in international joint ventures. *Strategic Management Journal* **34**: 1232–1243.
- Tong, T.W. & Reuer, J.J. (2007). Real options in strategic mgmt. *Advances in Strategic Management* **24**: 1–28.
- Tong, T.W. & Reuer, J.J. (2006). Firm and industry influences on the value of growth options. *Strategic Organization* **4**: 71–96.
- Tong, T.W., Reuer, J.J. & Peng, M.W. (2008). International joint ventures and the value of growth options. *The Academy of Management Journal* **51**(5): 1014–1029.
- Villalonga, B. & Amit, R. (2006). How do family ownership, control, and management affect firm value? *Journal of Financial Economics* **80**: 385–417.
- Wang, T. & Song, M. (2016). Are Founder Directors Detrimental to New Ventures at Initial Public Offering? *Journal of Management* **42**(3): 644–670.

- Wasserman, N. (2006). Stewards, agents, and the founder discount: Executive compensation in new ventures. *The Academy of Management Journal* **49**(5): 960–976.
- Wasserman, N. (2017). The throne vs. the kingdom: Founder control and value creation in startups. *Strategic Management Journal* **38**(2): 255–277.
- Welbourne, T.M. & Andrews, A.O. (1996). Predicting the performance of initial public offerings: Should human resource management be in the equation? *The Academy of Management Journal* **39**: 891–919.
- Welbourne, T.M. & Cyr, L.A. (1999). The human resource executive effect in initial public offering firms. *The Academy of Management Journal* **42**: 616–629.
- Wiseman, R., & Gomez-Mejia, L.R. (1998). A behavioral agency model of risk taking. *Academy of Management Review* **23**: 133–153.
- Zellweger, T. (2007). Time horizon, costs of equity capital and generic investment strategies of firms. *Family Business Review* **20**(1): 1–15.
- Zellweger, T., Kellermanns, F.W., Chrisman, J.J. & Chua, J.H. (2012). Family control and family firm valuation by family CEOs: the importance of intentions for transgenerational control. *Organization Science* **23**(3): 851–868.
- Zorn, M.L., Shropshire, C., Martin, J.A. Combs, J.G. & Ketchen, D.J. (2017). Home Alone: The Effects of Lone-Insider Boards on CEO Pay, Financial Misconduct, and Firm Performance. *Strategic Management Journal* **38**: 2623–2646.

Table 1: Descriptive statistics

	(1) All firms			(2) Family firm			(3) Nonfamily firm			t-test ^b [(3)-(2)]
	Mean	Median	S.D.	Mean	Median	S.D.	Mean	Median	S.D.	
Growth option value	0.97	0.95	0.36	0.99	0.96	0.36	0.96	0.94	0.36	-0.03**
IPO proceeds	178.46	101.54	228.21	140.60	87.50	204.85	200.45	111.00	238.06	59.85***
Family firm ^a	0.37	0.00	0.48	1.00	1.00	0.00	0.00	0.00	0.00	-0.37***
Techn. uncertainty	0.46	0.00	0.50	0.58	1.00	0.49	0.40	0.00	0.49	-0.18***
Mkt. uncertainty	0.13	0.11	0.08	0.10	0.10	0.08	0.14	0.11	0.08	0.04***
Firm size	1,191.1	338.5	2,899.5	807.8	216.4	2,624.9	1,413.8	468.9	3,026.3	606.00***
Firm leverage	0.16	0.16	0.02	0.10	0.12	0.02	0.20	0.16	0.03	0.11***
Capital intensity	0.17	0.04	0.42	0.16	0.04	0.42	0.17	0.04	0.41	0.00
Firm age	24.88	14.00	27.60	15.76	14.45	11.00	30.19	17.00	31.73	14.43***
Organ. slack	0.29	0.17	0.38	0.36	0.41	0.28	0.25	0.13	0.35	-0.10***
Acquisitions	0.30	0.24	0.29	0.39	0.39	0.30	0.25	0.17	0.27	-0.13***
Liquidity	28.50	0.00	104.78	15.17	0.00	67.85	36.24	0.00	120.52	21.07***
Pre-IPO R&D	6.07	0.00	14.91	5.45	0.97	10.66	6.42	0.00	16.88	0.98
N	<u>2,213</u>			<u>813</u>			<u>1,400</u>			

Notes: ^a dichotomous variable; ^b t-test tests for the differences in mean of the family firm sample (2) and the nonfamily firm sample (3). The symbols *, ** and *** indicate two-tail significance at the 10%, 5% and 1% levels. Variables are not transformed to facilitate interpretation of the results. All continuous variables are winsorized at the 1st and 99th percentile. The categorical variables 'IPO security type' and 'IPO lead underwriter' are intentionally omitted from this univariate analysis.

Table 2: Family firm ownership and managerial involvement at IPO

	Mean	Median	S.D.
Family control pre-IPO (in %)	36.08	27.37	27.51
Family control post-IPO (in %)	27.36	19.01	22.74
% of IPOs with family control divestment	33.70	0.00	47.30
# of family members in active mgmt. per firm	1.70	2.00	0.84
relative (in %)	16.74	12.50	16.99
# of family members as directors per firm	1.43	1.00	0.60
relative (in %)	22.07	20.00	11.25
# of family members as executives per firm	1.26	1.00	0.86
relative (in %)	22.36	20.00	16.90

Notes: N = 219 unique IPO family firms. ^a dichotomous variable. Table 2 classifies firms as family firms if the founding family controls at least 5% of the firm and has at least one member of the family involved in the management after going public, and 0 otherwise.

Table 3: OLS Fixed-Effects Panel Data Estimation

	(I)	(II)	(III)	(IV)	(V)
Firm size	-0.0862*** (0.019)	-0.1119*** (0.017)	-0.1157*** (0.018)	-0.1177*** (0.018)	-0.1166*** (0.018)
Firm leverage	0.1365* (0.064)	0.1346* (0.064)	0.1317* (0.063)	0.1204* (0.062)	0.1285* (0.062)
Capital intensity	0.0359** (0.011)	0.0383*** (0.011)	0.0390*** (0.010)	0.0395*** (0.010)	0.0394*** (0.010)
Firm age	-0.0001 (0.001)	-0.0001 (0.001)	-0.0001 (0.001)	-0.0002 (0.010)	-0.0001 (0.001)
Organizational slack	0.1184** (0.045)	0.1114* (0.043)	0.1105* (0.043)	0.1101* (0.043)	0.1102* (0.042)
Acquisitions	0.0001 (0.000)	0.0001 (0.000)	0.0001 (0.000)	0.0001 (0.000)	0.0001 (0.001)
Liquidity	0.0572 (0.090)	0.0389 (0.092)	0.0460 (0.092)	0.0455 (0.091)	0.0423 (0.091)
Pre-IPO R&D expense	0.0021* (0.001)	0.0017* (0.001)	0.0018* (0.001)	0.0016 (0.001)	0.0017* (0.000)
IPO proceeds		0.0002*** (0.000)	0.0002*** (0.000)	0.0002*** (0.000)	0.0003*** (0.000)
Family firm (FF)			-0.0571** (0.023)	-0.0836** (0.041)	-0.0020 (0.035)
IPO proceeds*FF			0.0002** (0.000)	0.0001* (0.000)	-0.0001 (0.000)
Techn. uncertainty				0.0000 (0.000)	
IPO proceeds*Techn. uncertainty				0.0013 (0.045)	
FF*Techn. uncertainty				-0.0148 (0.056)	
IPO proceeds*FF*Techn. uncertainty				0.0007** (0.000)	
Mkt. uncertainty					0.1832 (0.248)
IPO proceeds*Mkt. uncertainty					-0.0006 (0.001)
FF*Mkt. uncertainty					-0.4420* (0.267)
IPO proceeds*FF*Mkt. uncertainty					0.0013*** (0.001)
Year fixed effects	Incl.***	Incl.***	Incl.***	Incl.***	Incl.***
Industry fixed effects	Incl.***	Incl.***	Incl.***	Incl.***	Incl.***
Adjusted R-squared	0.342	0.352	0.355	0.357	0.355
N	2,213	2,213	2,213	2,213	2,213

Notes: The symbols *, ** and *** indicate two-tail significance at the 10%, 5% and 1% levels. Variables 'IPO security type' and 'IPO lead underwriter' are included in the regression but not reported due to space constraints.

Table 4: Balancing test for covariates in propensity score matching

To assess the matching fit of the untreated and treated samples, we follow Neckebrouck et al. (2018) and perform t-tests to compare the sample means of the covariates included in our propensity score for Hypothesis 1 to Hypothesis 4. In Panel A, we perform the t-tests of the covariates on the full sample. In Panel B, we perform the t-tests of the covariates on the matched sample. Note that we also match observations based on industry classification and calendar year (Neckebrouck et al., 2018).

<i>Panel A: Selected covariates pre-matched (full sample)</i>							
<i>Covariates</i>	Family firms		Nonfamily firms		Family firms - Nonfamily firms		
	Mean	s.d.	Mean	s.d.	Contrast	s.e.	p-value
Firm size (ln)	5.483	1.347	6.201	1.420	-0.718	0.061	0.000
Capital intensity (ln)	-3.076	1.582	-3.101	1.584	0.025	0.070	0.716
Firm age	15.745	14.456	30.696	33.898	-14.950	1.250	0.000
Notes: N= 2'213 (813 family firm-year observations and 1'400 nonfamily firm observations). s.d. refers to standard deviation; s.e. refers to standard error							
<i>Panel B: Selected covariates post-matched (matched sample)</i>							
<i>Covariates</i>	Family firms		Nonfamily firms		Family firms - Nonfamily firms		
	Mean	s.d.	Mean	s.d.	Contrast	s.e.	p-value
Firm size (ln)	5.483	1.347	5.566	1.233	-0.083	0.064	0.196
Capital intensity (ln)	-3.076	1.582	-3.067	1.604	-0.009	0.079	0.907
Firm age	15.745	14.456	16.696	16.290	-0.951	0.764	0.213
Notes: N= 1'626 (813 family firm-year observations and 813 nonfamily firm observations). s.d. refers to standard deviation; s.e. refers to standard error							

Table 5: Two-way fixed effects OLS regression using a matched sample

	(I)	(II)	(III)	(IV)	(V)
Firm size	-0.0900*** (0.020)	-0.1112*** (0.017)	-0.1142*** (0.018)	-0.1182*** (0.018)	-0.1147*** (0.017)
Firm leverage	0.0865 (0.069)	0.0809 (0.070)	0.0788 (0.068)	0.0524 (0.069)	0.0788 (0.068)
Capital intensity	0.0331** (0.013)	0.0354** (0.012)	0.0361** (0.012)	0.0368** (0.012)	0.0359** (0.012)
Firm age	-0.0014 (0.001)	-0.0015 (0.001)	-0.0015* (0.001)	-0.0017* (0.001)	-0.0016* (0.001)
Organizational slack	0.1153* (0.046)	0.1089* (0.045)	0.1070* (0.044)	0.1070* (0.044)	0.1067* (0.044)
Acquisitions	0.0001 (0.000)	0.0002 (0.000)	0.0002+ (0.000)	0.0002+ (0.000)	0.0002+ (0.000)
Liquidity	0.0578 (0.093)	0.0495 (0.095)	0.0532 (0.094)	0.0490 (0.093)	0.0497 (0.094)
Pre-IPO R&D expense	0.0025 (0.002)	0.0022 (0.002)	0.0022 (0.002)	0.0020 (0.002)	0.0022 (0.002)
IPO proceeds		0.0002** (0.000)	0.0001 (0.000)	0.0002* (0.000)	0.0001 (0.000)
Family firm (FF)			-0.0683* (0.029)	-0.0838 (0.054)	-0.0192 (0.042)
IPO proceeds*FF			0.0002** (0.000)	0.0001 (0.000)	0.0002 (0.000)
Techn. uncertainty				0.0015 (0.059)	
IPO proceeds*Techn. uncertainty				-0.0002 (0.000)	
FF*Techn. uncertainty				-0.0454 (0.072)	
IPO proceeds*FF*Techn. uncertainty				0.0011** (0.000)	
Mkt. uncertainty					0.2467 (0.281)
IPO proceeds*Mkt. uncertainty					0.0002 (0.001)
FF*Mkt. uncertainty					-0.3812 (0.292)
IPO proceeds*FF*Mkt. uncertainty					0.0006 (0.001)
Year fixed effects	Included***	Included***	Included***	Included***	Included***
Industry fixed effects	Included***	Included***	Included***	Included***	Included***
Adjusted R-squared	0.355	0.361	0.365	0.370	0.364
N	1'626	1'626	1'626	1'626	1'626

Notes: The symbols *, ** and *** indicate two-tail significance at the 10%, 5% and 1% levels. Variables 'IPO security type' and 'IPO lead underwriter' are included in the regression but not reported due to space constraint

Table 6: Influence of institutional ownership

	5% inst. ownership (dummy)			5% inst. Ownership (continuous)		
	(I)	(II)	(III)	(IV)	(V)	(VI)
Firm size	-0.1063*** (0.018)	-0.1066*** (0.018)	-0.1072*** (0.018)	-0.1051*** (0.017)	-0.1109*** (0.017)	-0.1051*** (0.017)
Firm leverage	0.105 (0.085)	0.104 (0.087)	0.104 (0.084)	0.104 (0.090)	0.103 (0.088)	0.102 (0.089)
Capital intensity	0.0368*** (0.012)	0.0370*** (0.012)	0.0368*** (0.012)	0.0373*** (0.012)	0.0380*** (0.012)	0.0374*** (0.012)
Firm age	0.0001 (0.000)	0.0001 (0.000)	0.0001 (0.000)	0.0001 (0.000)	0.0001 (0.000)	0.0001 (0.000)
Organizational slack	0.1247* (0.072)	0.1242* (0.072)	0.1248* (0.072)	0.121 (0.074)	0.120 (0.073)	0.122 (0.074)
Acquisitions	0.0001 (0.000)	0.0001 (0.000)	0.0001 (0.000)	0.0001 (0.000)	0.0001 (0.000)	0.0001 (0.000)
Liquidity	-0.0085 (0.087)	-0.0083 (0.085)	-0.0095 (0.087)	-0.0106 (0.091)	-0.0149 (0.092)	-0.0104 (0.092)
Pre-IPO R&D expense	0.0009 (0.001)	0.0010 (0.001)	0.0009 (0.001)	0.0009 (0.001)	0.0014 (0.001)	0.0009 (0.001)
IPO proceeds	0.0003*** (0.000)	0.0003*** (0.000)	0.0002 (0.000)	0.0003*** (0.000)	0.0002** (0.000)	0.0003*** (0.000)
Institutional ownership (IO)	0.0437 (0.032)	0.0572 (0.040)	0.0110 (0.051)	0.1355* (0.071)	0.0948 (0.111)	0.1673 (0.122)
IPO proceeds*IO	-0.0000 (0.000)	-0.0000 (0.000)	0.0001 (0.000)	-0.0002 (0.000)	0.0004 (0.000)	-0.0006 (0.001)
Techn. uncertainty		0.0073 (0.058)			-0.0198 (0.049)	
IPO proceeds*Techn. uncertainty		0.0000 (0.000)			0.0001 (0.000)	
IO*Techn. uncertainty		-0.0231 (0.063)			-0.0016*** (0.001)	
IPO proceeds*IO*Techn. uncertainty		-0.0000 (0.000)			-0.1109*** (0.017)	
Mkt. uncertainty			-0.1856 (0.313)			0.0471 (0.144)
IPO proceeds*Mkt. uncertainty			0.0010 (0.001)			-0.0005 (0.001)
IO*Mkt. uncertainty			0.2567 (0.383)			-0.2389 (0.569)
IPO proceeds*IO*Mkt. uncertainty			-0.0013 (0.001)			0.0033 (0.003)
Year and industry fixed effects	Incl. ***	Incl. ***	Incl. ***	Incl. ***	Incl. ***	Incl. ***
Adjusted R-squared	0.358	0.357	0.357	0.359	0.363	0.358
N	2'011	2'011	2'011	2'011	2'011	2'011

Notes: The symbols *, ** and *** indicate two-tail significance at the 10%, 5% and 1% levels. Variables 'IPO security type' and 'IPO lead underwriter' are included in the regression but not reported due to space constraints.

Table 7: Robustness of family firm definition

	15% family control (dummy)			Family control (continuous)		
	(I)	(II)	(III)	(IV)	(V)	(VI)
Firm size	-0.1160*** (0.017)	-0.1168*** (0.017)	-0.1165*** (0.017)	-0.1140*** (0.017)	-0.1155*** (0.017)	-0.1142*** (0.017)
Firm leverage	0.1305* (0.064)	0.1227* (0.062)	0.1275* (0.063)	0.1298** (0.064)	0.1214* (0.062)	0.1290** (0.064)
Capital intensity	0.0393*** (0.010)	0.0391*** (0.010)	0.0395*** (0.010)	0.0388*** (0.010)	0.0387*** (0.010)	0.0390*** (0.010)
Firm age	-0.0001 (0.001)	-0.0001 (0.001)	-0.0001 (0.001)	-0.0001 (0.001)	-0.0001 (0.001)	-0.0001 (0.001)
Organizational slack	0.1103** (0.042)	0.1117** (0.043)	0.1108** (0.042)	0.1090** (0.042)	0.1089** (0.042)	0.1091*** (0.042)
Acquisitions	0.0001 (0.000)	0.0001 (0.000)	0.0001 (0.000)	0.0001 (0.000)	0.0001 (0.000)	0.0001 (0.000)
Liquidity	0.0405 (0.091)	0.0426 (0.088)	0.0383 (0.089)	0.0363 (0.092)	0.0409 (0.089)	0.0364 (0.092)
Pre-IPO R&D expense	0.0016+ (0.001)	0.0015 (0.001)	0.0015+ (0.001)	0.0017* (0.001)	0.0016 (0.001)	0.0017* (0.001)
IPO proceeds	0.0002** (0.000)	0.0002** (0.000)	0.0003** (0.000)	0.0002*** (0.000)	0.0002*** (0.000)	0.0002*** (0.000)
Family firm (FF)	-0.0897*** (0.026)	-0.079* (0.041)	-0.0463 (0.032)	-0.1388** (0.058)	-0.1487 (0.094)	-0.0751 (0.080)
IPO proceeds*FF	0.0002*** (0.000)	0.0001* (0.000)	-0.0463 (0.032)	0.0004** (0.000)	0.0004** (0.000)	0.0002 (0.000)
Techn. Uncertainty		0.0187 (0.044)			0.0104 (0.047)	
IPO proceeds*Techn. Uncertainty		0.0000 (0.000)			0.0000 (0.000)	
FF*Techn. Uncertainty		-0.0638 (0.059)			-0.1630 (0.155)	
IPO proceeds*FF*Techn. uncertainty		0.0008** (0.000)			0.0023*** (0.001)	
Mkt. uncertainty			0.0916 (0.216)			0.0857 (0.215)
IPO proceeds*Mkt. uncertainty			-0.0005 (0.000)			-0.0004 (0.000)
FF*Mkt. uncertainty			-0.3611 (0.275)			-0.5305 (0.569)
IPO proceeds*FF*Mkt. uncertainty			0.0008** (0.001)			0.0014** (0.001)
Year and industry fixed effects	Incl.***	Incl.***	Incl.***	Incl.***	Incl.***	Incl.***
Adjusted R-squared	0.358	0.359	0.358	0.355	0.357	0.354
N	2,213	2,213	2,213	2,213	2,213	2,213

Notes: The symbols *, ** and *** indicate two-tail significance at the 10%, 5% and 1% levels. Variables 'IPO security type' and 'IPO lead underwriter' are included in the regression but not reported due to space constraints.

Table 8: Robustness of the dependent variable

	15% discount rate			Industry-level WACC		
	(I)	(II)	(III)	(IV)	(V)	(VI)
Firm size	-0.1542*** (0.024)	-0.1570*** (0.024)	-0.1555*** (0.024)	-0.3246*** (0.050)	-0.3292*** (0.050)	-0.3271*** (0.050)
Firm leverage	0.1756** (0.084)	0.1605* (0.083)	0.1714** (0.083)	0.3336* (0.177)	0.3072* (0.178)	0.3253* (0.176)
Capital intensity	0.0519*** (0.014)	0.0526*** (0.014)	0.0525*** (0.014)	0.1077*** (0.028)	0.1092*** (0.028)	0.1087*** (0.028)
Firm age	-0.0002 (0.001)	-0.0003 (0.001)	-0.0001 (0.001)	-0.0002 (0.001)	-0.0004 (0.001)	-0.0001 (0.001)
Organizational slack	0.1473** (0.057)	0.1468** (0.057)	0.1469** (0.056)	0.3040** (0.127)	0.3016** (0.126)	0.3030** (0.125)
Acquisitions	0.0001 (0.000)	0.0001 (0.000)	0.0001 (0.000)	0.0002 (0.000)	0.0002 (0.000)	0.0002 (0.000)
Liquidity	0.0614 (0.122)	0.0607 (0.120)	0.0564 (0.121)	0.1151 (0.268)	0.1113 (0.262)	0.1069 (0.266)
Pre-IPO R&D expense	0.0024* (0.001)	0.0022 (0.001)	0.0023* (0.001)	0.0045 (0.003)	0.0041 (0.003)	0.0044 (0.003)
IPO proceeds	0.0003*** (0.000)	0.0003*** (0.000)	0.0004*** (0.000)	0.0005** (0.000)	0.0006** (0.000)	0.0008** (0.000)
Family firm (FF)	-0.0762** (0.031)	-0.1114** (0.055)	-0.0027 (0.047)	-0.1649** (0.068)	-0.2431** (0.122)	-0.0239 (0.111)
IPO proceeds*FF	0.0002** (0.000)	0.0002* (0.000)	0.0002* (0.000)	0.0005** (0.000)	0.0005* (0.000)	0.0005* (0.000)
Techn. uncertainty		0.0017 (0.061)			0.0164 (0.131)	
IPO proceeds*Techn. uncertainty		0.0000 (0.000)			0.0000 (0.001)	
FF*Techn. uncertainty		-0.0197 (0.075)			-0.0082 (0.163)	
IPO proceeds*FF*Techn. uncertainty		0.0009** (0.000)			0.0016** (0.001)	
Mkt. uncertainty			0.2442 (0.330)			0.5626 (0.711)
IPO proceeds*Mkt. uncertainty			-0.0008 (0.001)			-0.0015 (0.002)
FF*Mkt. uncertainty			-0.5894* (0.355)			-1.1003 (0.799)
IPO proceeds*FF*Mkt. uncertainty			0.0017** (0.001)			0.0036** (0.002)
Year and industry fixed effects	Incl.***	Incl.***	Incl.***	Incl.***	Incl.***	Incl.***
Adjusted R-squared	0.355	0.357	0.355	0.352	0.354	0.352
N	2,213	2,213	2,213	2,213	2,213	2,213

Notes: The symbols *, ** and *** indicate two-tail significance at the 10%, 5% and 1% levels. Variables 'IPO security type', 'IPO lead underwriter' are included in the regression but not reported due to space constraints.

Appendix A: Pearson's correlation matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) IPO proceeds	1.0000										
(2) Family firm ^a	-0.1067*	1.0000									
(3) Techn. uncertainty ^a	-0.1877*	0.1683*	1.0000								
(4) Mkt. uncertainty	0.0048	-0.2539*	-0.0530*	1.0000							
(5) Firm size	0.5690*	-0.2177*	-0.3345*	0.0389*	1.0000						
(6) Firm leverage	0.1667*	-0.1922*	-0.2023*	0.0753*	0.2912*	1.0000					
(7) Capital intensity	-0.0527*	-0.0247	-0.0017	0.0219	0.1126*	0.1615*	1.0000				
(8) Firm age	0.2095*	-0.2485*	-0.3451*	0.0568*	0.3227*	0.2398*	-0.0697*	1.0000			
(9) Organizational slack	-0.1907*	0.1368*	0.3913*	-0.0422*	-0.3983*	-0.0973*	0.0734*	-0.2318*	1.0000		
(10) Liquidity	-0.2437*	0.1969*	0.3910*	-0.0191	-0.5358*	-0.3535*	-0.0831*	-0.2397*	0.3336*	1.0000	
(11) Acquisitions	0.1606*	-0.0796*	-0.0231	-0.0183	0.3015*	0.1335*	-0.0130	0.0478*	-0.0674*	-0.1640*	1.0000
(12) Pre-IPO R&D expense	0.2114*	-0.0287	0.2184*	0.0254	0.0924*	0.0403*	0.0116	0.0063	0.1067*	0.1539*	0.0614*

Notes: * $p < 0.05$; ^a dichotomous variable; all continuous variables are winsorized at the 1st and 99th percentile. The categorical variables 'IPO security type' and 'IPO lead underwriter' are intentionally omitted from Appendix A.

Appendix B: List of firms by primary business focus

Primary business focus	All firms	Family firms	Nonfamily firms	Family firms (%)
Applications Software	54	24	25	44
Cellular Communications	42	21	22	50
Data Processing Services	31	12	20	39
General Medical Instruments	62	24	38	39
General Pharmaceuticals	127	45	74	35
Internet Services & Software	162	97	70	60
Medical Imaging Systems	49	26	23	53
Medicinal Chemicals General	4	0	4	0
Networking Systems	26	17	12	65
Precision/Measuring Test Equipment	6	3	0	50
Process Control Systems	5	0	5	0
Research & Development Firm	37	23	22	62
Robotics	5	2	0	40
Satellite Communications	11	6	5	55
Scanning Devices	5	5	0	100
Semiconductors	102	48	49	46
Surgical Instruments/Equipment	27	11	19	41
Telecommunications Equipment	20	7	15	35
Utilities/File Management Software	9	5	4	56
Vaccines & Specialty Drugs	19	5	16	26
Other Biotechnology/R&D	65	28	38	43
Other Computer Related Services	46	11	32	24
Other Electronics	16	7	8	44
Other High-tech business	14	12	2	86
Other Peripherals	22	9	9	41
Other Software	66	37	35	56
Other Telecommunications Equipment	3	0	3	0
Non-high technology business	1,178	328	850	28
<u>Total</u>	<u>2,213</u>	<u>813</u>	<u>1,400</u>	<u>37</u>

Appendix C: Detailed description of market uncertainty

In measuring market uncertainty, we closely follow Oriani and Sobrero (2008) and Folta and O'Brien (2004). We take the following steps to calculate market uncertainty, operationalized as the absolute percentage difference between predicted GDP industry output and actual GDP industry output per year.

Step 1: We retrieve Annual GDP output data by industry for the United States from the Bureau of Economic Analysis (BEA) at the U.S. Department of Commerce for the years of 1947 to 2012.

Step 2: We use the industry classification provided in Folta and O'Brien (2004) and identify 50 industries with available annual GDP output data. In contrast to Folta and O'Brien (2004) who identified 51 industries, we were unable to discern the two industries "Auto Repair Services & Parking" and "Misc., Repair Services" and classify these categories as one industry.

Step 3: For each of the 50 individual time series with annual GDP industry data, we use a Generalized Autoregressive Conditional Heteroskedasticity (GARCH) model to estimate the conditional variance of industry GDP output (Bollerslev, 1986). Specifically, we include a first-order autoregressive term (AR(1)) of industry output to estimate our model (Oriani & Sobrero, 2008). We estimate the following GARCH (1,1) model including an AR(1) with the maximum likelihood method.

$$\begin{aligned} y_{i,t} &= \beta y_{i,t-1} + \varepsilon_{i,t} \\ \sigma_{i,t}^2 &= c_o + \alpha \varepsilon_{i,t-1}^2 + \delta \sigma_{t-1}^2 \end{aligned} \tag{3}$$

Step 4: For each of the 50 industries, we use the fitted model to calculate the annual predicted GDP industry output between 2004 and 2012, which are the corresponding years in the panel dataset.

Step 5: For each industry and each year, we then calculate the absolute percentage difference between the annual predicted GDP output and the actual GDP output.

$$\Delta_{GDP\ output}_{i,t} = abs \left| \left(\frac{\overline{y_{i,t}}}{y_{i,t}} - 1 \right) \right| \tag{4}$$

Step 6: Finally, we match the 50 industries as defined by the Bureau of Economic Analysis with the SIC industry classification by adopting the coding scheme as in Folta and O'Brien (2004). This allows us to link the measurements for market uncertainty for each year and industry with our existing dataset on the industry level.

Appendix D: Description of variables

Variable		Description
1	Growth opportunity	Continuous variable measured as the difference between the total market value and the value of total assets, as a percentage of the firm's total market value
2	IPO proceeds	Continuous variable measured as the total proceeds received after the Initial Public Offering
3	Family firm	Dichotomous variable that equals 1 if the founding family controls at least 5% of the firm and has at least one member of the family involved in the management at the time of the IPO, 0 otherwise
4	Technological uncertainty	Dichotomous variable that equals 1 if the primary line of business is a high-technology, 0 otherwise
5	Market uncertainty	Continuous variable measured as the absolute percentage difference between the predicted market demand and actual market demand per year and industry
6	Firm size	Continuous variable measured as the natural logarithm of the total assets of the firm at the end of the year
7	Firm leverage	Continuous variable measured as the total debt outstanding divided by total firm assets
8	Capital intensity	Continuous variable measured as the natural logarithm of capital expenditures relative to the total number of sales
9	Firm age	Continuous variable measured as the difference between the financial year and the founding year of the firm
10	Organizational slack	Continuous variable measured as the total selling, general and administrative expenses divided by total firm sales
11	Acquisitions	Continuous variable measured as the annual investments allocated into mergers and acquisitions
12	Liquidity	Continuous variable measured as the delta between the current assets and the current liabilities divided by total assets
13	Pre-IPO R&D expenditure	Continuous variable measured as the average annual expenses in R&D for the two years prior to going public
14	IPO lead underwriter	Categorical variable defined as the lead underwriter responsible for the Initial Public Offering
15	Type of IPO security	Categorical variable defined as the type of security issued as part of the Initial Public Offering

[This page intentionally left blank]

Chapter IV

Financial Stewardship in Newly Public Family Firms

Financial Stewardship in Newly Public Family Firms

Tobias H. Schori ^a

Abstract

The organizational context in which firms are embedded in plays an important role to what extent financial stewardship can emerge and prevail. We compare financial stewardship in newly public family firms to that of newly public nonfamily firms after an Initial Public Offering (IPO), where firms transition from a private ownership to a public ownership setting. We suggest that this change in organizational context affects three key components of financial stewardship behavior, i.e., long-term orientation, autonomy and empowerment as well as firm identity. We find that newly public family firms experience a larger decrease in post-IPO financial stewardship than newly public nonfamily firms, compared to pre-IPO levels. In addition, within newly public family firms, large, nonfamily blockholders have a negative effect on the change in post-IPO financial stewardship, relative to pre-IPO levels. Conceding to a stewardship logic, family influence, in terms of family managerial involvement and family ownership, positively moderate the relationship between nonfamily blockholder ownership and the decrease in post-IPO financial stewardship, compared to pre-IPO levels, within newly public family firms.

Keywords: *Stewardship theory, family business, Initial Public Offering*

^a University of St. Gallen, The St.Gallen Institute of Management in Asia, 111 Amoy Street, Singapore 069931; tobias.schori@unisg.ch

1 INTRODUCTION

Following stewardship theory, family owners are good financial stewards of their own family businesses (Davis et al., 1997; Donaldson, 1990). Family owners often own substantial equity stakes in the family business (Villalonga & Amit, 2006; Anderson & Reeb, 2004), are involved in firm management (Miller et al., 2008; Anderson & Reeb, 2004), personally identify themselves with the firm (Zellweger et al., 2011; Bubolz, 2001), employ long-term investment horizons (Miller et al., 2008; Zahra et al., 2008; Miller & Le Breton Miller, 2005) and are emotionally invested in the business (Gomez-Mejia et al., 2007). All these factors should result in a convergence of manager-principal interests and support financial stewardship behavior, i.e., farsighted financial decision-making of managers (Davis et al., 2010; 1997; Corbetta & Salvato, 2004). However, empirical evidence on whether family firms are good or bad financial stewards is mixed (Neckebrouck et al., 2018; Le Breton-Miller et al., 2011).

In this paper, our central thesis is that the organizational context is an important determinant to what extent financial stewardship behavior can emerge and prevail. Our main focus is to compare how a change in organizational context affects financial stewardship of family firms relative to that of nonfamily firms. In their seminal work, Davis et al. (1997) and Donaldson (1990) suggest that for stewardship behavior to prevail, the organizational context must be designed in a way to enable collectivistic, trustworthy and pro-organizational behavior. Only in such environments, stewards can act most effectively, while monitoring efforts on stewards for example can have deleterious effects on stewardship behavior (Donaldson & Davis, 1991; Donaldson, 1990). Family business research broadly acknowledges that the organizational context may be an important determinant to influence stewardship behavior but does not offer direct empirical evidence (Neckebrouck et al., 2018; Madison et al., 2016; Le Breton-Miller et al., 2011; Miller et al., 2008; 2007; Davis et al., 1997). To the best of our knowledge, our study is the first to develop a conceptual understanding of how organizational contexts affect financial stewardship and the first to offer direct empirical evidence. Conceptually, we propose two forms of organizational contexts, i.e., a stewardship enabling and a stewardship hindering context. We identify three key components embedded in stewardship theory

that must be supported in an organizational context to enable and nurture financial stewardship behavior in family firms along which we develop our hypotheses, i.e., 1) long-term orientation, 2) autonomy and empowerment and 3) firm identity.

Empirically, we are challenged to find a setting in which we can compare financial stewardship behavior in family firms to that of nonfamily firms in two distinct organizational contexts (i.e., enabling and hindering) to single out transitional effects from a stewardship enabling to a stewardship hindering context. By comparing family firms, as our focal interest group, to nonfamily firms, as our counterfactual group, we aim to reduce the risk of confounding idiosyncratic firm characteristics that may directly affect financial stewardship but are not caused by the change in organizational context. We argue that the context of Initial Public Offerings (IPO), where firms transition from a private to a public ownership setting, is fitting to our purpose for two reasons. First, going public is a transformational change event (Fischer & Pollock, 2004), which can have a wide-reaching impact on the organizational setup, governance structure and strategic decision-making (Ragozzino & Reuer, 2011; Certo et al., 2009; Nelson, 2003; Certo et al., 2001). For example, an IPO may affect a family firm's flexibility to invest in their future business and undermine the desire to sacrifice short-term gains for long-term value creation (Le Breton-Miller et al., 2011). Second, literature concedes that the private and public ownership setting are two distinct forms of organizational context which may affect stewardship behavior in family firms in different ways (Madison et al., 2016; Le Breton-Miller et al., 2011; Miller et al., 2008).

We analyze how going public affects financial stewardship using a panel dataset of 533 IPO firms that went public in the United States between 2004 and 2007. Importantly, we refer to newly public family firms as family firms that retained significant ownership after the IPO (e.g., Kotlar et al., 2017; Leitterstorf & Rau, 2014). Our focal dependent variable, post-IPO financial stewardship, measures the change in financial stewardship after a public offering relative to pre-IPO levels since we are interested in how financial stewardship is affected as firms transform from a private to a public ownership setting. Our study has three main findings. First, we find a larger decrease in post-IPO financial stewardship in newly public family firms, compared to newly public non-family firms. The findings suggest that going public has a particularly detrimental effect

on newly public family firm financial stewardship, compared to newly public nonfamily firms. Second, we investigate the role of significant nonfamily blockholders, which we define as significant shareholders of the family firm who are not part of the founding family (Villalonga & Amit, 2006). We focus on nonfamily blockholders because they play a crucial role in financial decision-making and financial behavior in family firms (Anderson & Reeb, 2004) and are an important determinant in shaping financial stewardship behavior (Donaldson, 1990; Cyert & March, 1963). We find that nonfamily blockholders have a negative effect on the change in post-IPO financial stewardship within newly public family firms, lending support to the notion that nonfamily blockholders may have power to curb financial decision-making in family firms (Lee & O'Neill 2003; Bennedsen & Wolfenzon, 2000). Third, our results show that family influence, along the two dimensions of family managerial involvement and family ownership (Le Breton-Miller & Miller, 2009), has a positive moderating effect on the relationship between nonfamily blockholder ownership and a change in post-IPO financial stewardship in family firms.

Our study contributes to stewardship theory and family business research in several ways. First, we contribute to stewardship theory by suggesting that contextual factors associated with stewardship behavior may help explain some of the divergent findings and views on family firm stewardship (Neckebrouck et al., 2018; Le Breton-Miller et al., 2011; Miller et al., 2008). Our findings lend support to the notion that the organizational context, in which family firms are embedded in, may be indeed an important determinant to what extent family presence is beneficial to stewardship behavior in family firms (Madison et al., 2016). Second, we contribute to the ongoing discussion if and how specific governance arrangements in family firms affect steward-like behavior and how financial stewardship evolves over time (Madison et al., 2016; Le Breton-Miller et al., 2011; Miller et al., 2008; Davis et al., 2010). We overcome limitations of previous research on financial stewardship in family firms which has focused exclusively on either private or public ownership (e.g., Neckebrouck et al., 2018; Le Breton-Miller et al., 2011). Third, we contribute to a more nuanced understanding how the presence of nonfamily blockholders affects financial outcomes in family firms (Cacciotti & Ucbasaran, 2018; Fattoum-Guedri et al., 2018). By monitoring and constraining family owners in

independently defining governance structure and making investment decisions after going public (Anderson & Reeb, 2004), their presence may compromise a family's autonomy and empowerment to exert steward-like behavior in newly public family firms and compromise family firm identity, resulting in an exacerbation of conflicts of interest between family owners and nonfamily blockholders.

2 HYPOTHESIS DEVELOPMENT

2.1 Financial stewardship during the transition from private to public ownership

Stewardship theory is grounded on the central premise that managers are driven by a pro-organizational and collectivistic behavior (Donaldson & Davis, 1991; Donaldson, 1990). In contrast to an agency perspective, which assumes that managers are self-serving and will use their power to exploit others (Jensen & Meckling, 1976), here, a manager's main motivation is based on a need for achievement and self-actualization with high levels of value identification, loyalty and commitment to the firm (Davis et al., 1997). As the interests of managers converge with those of a firm's principal, managers will act in the interest of the organization and stewardship-like behavior is likely to emerge (Davis et al., 1997). As families frequently hold substantial equity stakes and are also involved in the firm's management (Anderson & Reeb, 2004), interests between principals and managers in family firms may converge. In addition, family owners are often emotionally invested in the family firm (Bubolz, 2001) and intend to hold on to their businesses over multiple generations (Zellweger et al., 2012). Following stewardship assumptions, family firms thus should display high levels of financial stewardship behavior (Miller et al., 2008; 2007).

Stewardship mechanisms have been frequently used to explain governance aspects and financial outcomes in family firms (e.g., Neckebrouck et al., 2018; Davis et al., 2010; Miller & Le-Breton Miller, 2008). For example, research suggests that stewardship behavior may result in a competitive advantage for family firms (Eddleston et al., 2010) and outperformance (Anderson & Reeb, 2003). In addition, Le Breton Miller et al. (2011) and Miller et al. (2008) argue that stewardship behavior in family firms leads to longer-

term investment horizons, manifesting in a long-run approach. In addition, stewardship behavior in family firms can result in heightened risk tolerance as well as a higher propensity to invest in R&D and retain dividends for internal funding of such projects (Le Breton-Miller et al., 2011).

Importantly, scholars suggest that stewardship behavior also depends on the organizational context and specific governance arrangements, firms are embedded in (Madison et al., 2016; Davis et al., 1997). Stewardship theory proposes that for stewardship behavior to emerge, firm organizational structures must be designed to enable collectivistic and pro-organizational behavior (Donaldson & Davis, 1991). Put differently, stewards are most effective when they are embedded in an involvement-oriented and empowering organizational structure that supports stewardship behavior. For example, Donaldson (1990) suggests that monitoring and disciplining mechanisms in organizations have deleterious effects on stewardship behavior because it undermines a steward's motivation and commitment to the firm. One prominent example of contrasting organizational contexts are private and public ownership settings (Madison et al., 2016; Le Breton-Miller et al., 2011; Miller et al., 2008). Indeed, regarding family firm financial stewardship, empirical evidence is mixed. While family influence positively affects financial stewardship in privately held family firms (Neckebrouck et al., 2018), family embeddedness negatively affects financial stewardship in publicly listed family firms (Le Breton-Miller et al., 2011). Thus, it is a relevant question to address how going public affects financial stewardship in newly public family firms, compared to that of newly public nonfamily firms.

We posit that going public, and thereby the change in organizational context from a private to public ownership setting, may adversely affect three key components of financial stewardship, i.e., 1) *long-term orientation*, 2) *autonomy and empowerment* as well as 3) *firm identity*. Hereinafter, we first investigate how a change in organizational context may affect financial stewardship in newly public family firms before we analyze how such a change contrasts with newly public nonfamily firms as the counterfactual.

[insert Figure 1 about here]

First, a public offering may alter a family firm's long-term orientation to apply a more short-term investment horizon. Stewardship theory suggests that stewards are willing to commit to long-term investments and to tolerate risky and uncertain investments (Le Breton-Miller & Miller, 2009; Davis et al., 2010; 1997). Family stewards are often concerned with the continuity and longevity of the firm, manifesting in what is coined a "long-run approach" (Le Breton-Miller et al., 2011; Miller et al., 2008; Zahra et al., 2008; Miller & Le Breton Miller, 2005). Intentions for business continuity (Miller et al., 2008) and transgenerational control (Zellweger et al., 2012) in family firms may perpetuate in longer-term investment horizons. Because family stewards are less concerned with generating short-term profits, they are better able to balance risks and returns of investment projects which eventually enhance long-term value for all stakeholders (Le Breton-Miller et al., 2011; Eddleston et al., 2010). After a public offering, the time horizon of strategic and financial decisions often shifts from a more long-term view to a shorter-term investment perspective (Nelson, 2003). Against this backdrop, IPOs may be a turning point where the long-term horizon of family stewards is being increasingly pressured by external stakeholders and market forces to pursue shorter-term firm growth and to increase profits (Lee & O'Neill, 2003; Certo et al., 2001; Rock, 1986). As new shareholders may be less emotionally attached to the family firm (Gomez-Mejia et al., 2007) and have limited intentions for continuity or transgenerational control, they may apply shorter-term investment horizons, which may adversely affect a family firm's ability to retain dividends and to commit to substantial investment in long-term R&D projects.

Second, a public offering may affect the autonomy and empowerment of family stewards such that they become more restrained in independently making financial decisions. Donaldson and Davis (1991) suggest that pro-organizational behavior requires a corporate governance structure that enables high authority and managerial discretion. Because stewards already act in alignment with firm interests and its stakeholders, imposing monitoring and control mechanisms in fact negatively impacts stewardship behavior (Davis et al., 1997; Argyris, 1964). In family firms, if involved in firm management, family members often enjoy high managerial discretion (Miller & Le Breton-Miller, 2006). Family stewards also tend to serve long tenures (Anderson & Reeb, 2003),

thus have accrued firm knowledge and built strong networks within the firm (Le Breton-Miller & Miller, 2009; Gersick et al., 1997). With a public offering, new shareholders form part of the ownership structure which may result in a dilution of control as well as family influence (Kotlar et al., 2017; Leitterstorf & Rau, 2014). Incumbent governance and power structures in newly public family firms may be challenged by new stakeholders as additional monitoring mechanisms can be installed, such as independent directorships (Anderson & Reeb, 2004). The addition of influential nonfamily shareholders may be especially detrimental to family interests because after a public offering, the interests between family and nonfamily shareholders often diverge (Bruton et al., 2010; Fischer & Pollok, 2004). For example, nonfamily shareholders may pressurize family stewards to payout dividends to shareholders instead of reinvesting income in future projects (Young et al., 2008). Lastly, while private family firms can act independently from the discipline imposed by capital markets (Fitza & Tihanyi, 2017; Le Breton-Miller & Miller, 2009), public family firms are required to comply with regulatory requirements and external governance guidelines set by market regulators when making financial decisions. These external governance arrangements politically constrain families in independently defining their governance structures (Jensen, 1994) and may inhibit newly public family firms in fostering financial stewardship behavior.

Third, going public may also affect a family's understanding of firm identity which could reduce the positive impact of family owner presence on financial stewardship. Firm identification is a core element of stewardship behavior as it enables stewards to understand and identify with a firm's mission, to align values and to create sense-making (Arregle et al., 2007; Davis et al., 1997; Ashforth & Mael, 1989). For family firms, the enterprise often forms an important part of a family's personal identity, while the fit between the family and firm identity is a crucial aspect for family owners (Zellweger et al., 2011; 2010). Family owners are closely embedded in the family firm over years which creates a sense of family belonging and an urge to fulfil family obligations (Tsui et al., 1997). As family stewards identify themselves strongly with family firm values and goals, financial motivations between stewards and the firm converge which fosters financial stewardship behavior (Eddleston et al., 2010; Miller et al., 2008; Arregle et al., 2007). When family firms go public, firm vision and shared values may deviate from

the family's original identity as public pressure from external stakeholders increase, making it harder to preserve family identity. The decline in family identity may adversely affect financial stewardship motivation as a steward's motives may be no longer necessarily aligned with the firm's financial objectives. For example, as firm identity decreases, stewards may be less willing to take financial risks since their commitment towards the firm has diminished. While stewards in private family firms often observe a strong relationship between the success of the organization and their personal satisfaction (Davis et al., 1997), this relationship can weaken with a decrease in firm identity. Simultaneously, synergies between the family and the firm tends to deteriorate as the perceived distance between the family and the business grows when firm identity weakens (Eddleston et al., 2010; Miller et al., 2008). Firm identity is inextricably linked to the organizational commitment of stewards (Davis et al., 2010). As firm identity of family stewards may weaken after going public, their value and continuance commitment (Mayer & Schoorman, 1998) towards the family firm should also decrease which should result in extenuated financial stewardship behavior, such as a reluctance to commit to investment in R&D projects or to reinvest dividends in large infrastructure projects.

Compared to newly public family firms, we hypothesize that going public has a weaker negative effect on financial stewardship behavior in newly public nonfamily firms. In nonfamily firms, financial stewardship behavior may be generally less pronounced than in family firms as agency problems arising from the separation of management and ownership tend to be more acute, and therefore stewardship behavior may be generally undermined, irrespective of the organizational context (Jensen & Meckling, 1976). As nonfamily firms are already more prone to experience agency problems, a public offering may not weaken financial stewardship behavior in nonfamily firms to the same extent as we have conjectured for family firms. First, nonfamily firms are often portrayed as organizations with atomistic shareholder structures, a lack of pro-organizational behavior in firm management and therefore short-term investment orientation (Corbetta & Salvato, 2004; Davis et al., 1997). New blockholders that form part of the new ownership structure in newly public nonfamily firms may continue to pursue short-term financial interests or apply a longer-term perspective. However, the absence of family blockholders in nonfamily firms should result in a weaker change in financial

stewardship after going public, as blockholder interests between these two groups may not substantially diverge and subsequently financial stewardship should not be threatened. Second, as nonfamily firms are firms characterized with the absence of strong stewards in firm management (Davis et al., 1997), it may be easier for nonfamily firm management to comply and reconcile with new blockholders that form part of the shareholder structure, new regulatory and financial reporting requirements as well as public market expectations (Lee & O'Neill 2003) which arise after a public offering. Put differently, such auxiliary requirements to constrain empowerment and autonomy of nonfamily firm management is more compatible when strong stewards are not present and financial stewardship behavior is less pronounced. Third, firm management in nonfamily firms tends to have limited firm ownership stakes and thus may not personally identify with firm values and firm financial motives to the same extent as family members (Bubolz, 2001) and rather focuses on personal goals and maximizing personal wealth. Consequentially, incentives of nonfamily management to pursue farsighted financial decision-making may be overall limited (Davis et al., 2010). A change in organizational context to a setting where firm identity may be less relevant, should have a weaker negative effect on financial stewardship behavior when firm identity is already extenuated.

In sum, we hypothesize that key components of financial stewardship behavior, such as the long-term orientation, autonomy and empowerment as well as firm identity, all of which support collectivistic and pro-organizational behavior (Le Breton-Miller & Miller, 2009; Davis et al., 2010; 1997) may be adversely affected as private firms go public, so that long-term orientation may be extenuated, autonomy and empowerment of stewards may be constrained, and firm identity may be compromised. Our theoretical arguments lead us to suggest that the decrease in post-IPO financial stewardship will be stronger in newly public family firms, compared to newly public nonfamily firms (H1).

HYPOTHESIS 1 (H1): Post-IPO financial stewardship will decrease more in newly public family firms, compared to newly public nonfamily firms.

2.2 Financial stewardship and nonfamily blockholder interests within family firms

Stewardship theory depicts stewards as being concerned and motivated about the overall well-being of the business rather than being driven by self-interest and personal motives (Davis et al., 1997). Concurrently, a steward's behavior is also dependent on coalition with firm owners (Donaldson, 1990; Cyert & March, 1963). The nature of steward-principal relationships and its consequences on financial stewardship behavior thereby plays a crucial role in stewardship theory (Davis et al., 1997). First, a mutual understanding of the steward's role between the steward and principal is necessary to establish a functioning stewardship relationship. In situations where a coalition is called into question, interests between the two parties may start to diverge (Donaldson, 1990). At the core of stewardship behavior rests the assumption that an involvement-oriented and empowering organizational structure enables stewards to exert pro-organizational behavior (Davis et al., 1997). Second, while principals can act as a monitoring and discipline mechanism to curb self-interest and personal motivations, and thereby reduce agentic behavior (Anderson & Reeb, 2004), under a stewardship logic, the monitoring of stewards can adversely affect pro-organizational and collectivistic behavior, so that stewardship behavior deteriorates.

In family firms, nonfamily blockholders, which we define as significant shareholders who are not part of the founding family, play an important role in curbing a family's influence on firm governance and family firm decision-making (Anderson & Reeb, 2004). Here, we emphasize theoretical mechanisms within family firms because such principal-principal conflicts are particularly salient in family firms (Villalonga et al., 2015). While family owners are emotionally attached to the firm (Deephouse & Jaskiewicz, 2013) and obtain non-economic utility from their ownership, nonfamily blockholders instead tend not to have emotional and socioemotional involvement in the firm and may instead focus more on profit maximization and short-term financial gain (Young et al., 2008), particularly after going public (Lee & O'Neill, 2003). Thus, interests of nonfamily blockholders and family owners can differ substantially (Leitterstorf & Wachter, 2016). We theorize that the presence of significant nonfamily blockholders will negatively affect long-term orientation, autonomy and empowerment as well as firm

identity and thus have a negative effect on the change in post-IPO financial stewardship within newly public family firms.

First, nonfamily blockholder presence should adversely affect long-term orientation in newly public family firms. Particularly, IPOs are often considered turning points where family firms may be increasingly pressured by external stakeholders to pursue shorter-term firm growth and to increase profits (Certo et al., 2001; Rock, 1986). Such short-term orientation however contradicts the idea of a pro-organizational firm behavior and the long-run approach of family firms (Le Breton-Miller et al., 2011), which is embedded in a firm's willingness to forgo short-term profits to ensure long-term value creation. For example, large nonfamily blockholders may begin demanding higher dividend payouts to compensate for their wealth tied up in the family firm (Young et al., 2008; Carney & Gedajlovic, 2002) while, in contrast, family stewards may prefer to retain corporate earnings for future investments (Le Breton-Miller et al., 2011). In addition, nonfamily blockholder interests to pursue short-term gains may also detain family stewards from making commitments to farsighted R&D investments.

Second, nonfamily blockholders may also increase monitoring and disciplining activities after a public offering which can negatively affect the autonomy and empowerment of family stewards. In the presence of strong nonfamily blockholders, a family steward's influence on decision-making may be limited substantially (Villalonga et al., 2015; Anderson & Reeb, 2004). Large nonfamily shareholders may have financial incentives as well as the ability to accrue relevant strategic information and can exert power on family firm management (Leitterstorf & Wachter, 2016). Ownership of nonfamily blockholders in family firms provides these shareholders with more monitoring and decision power over the management which in turn diminishes the autonomy and empowerment of family stewards after going public. Nonfamily blockholder presence may be particularly detrimental to family firm financial stewardship if particular financial interests between parties diverge (Davis et al., 1997), which is often the case after a public offering (Bruton et al., 2010; Fischer & Pollok, 2004). As new nonfamily blockholders become part of the family firm ownership structure after going public (Kotlar et al., 2017), conflicts of interests between established and new blockholder groups may start to emerge and distrust may arise. For example, nonfamily blockholder may

pressurize newly public family firms to conform with short-term reporting cycles and to adhere to public market principles of profit maximization. New blockholder that become part of the blockholder structure after a public offering, may not identify with the same values as the family stewards and pursue different goals and financial motives which would require them to closely monitor firm management and the financial decision-making process. Elevated monitoring efforts in newly public family firms would further curb the autonomy and empowerment of family stewards which eventually may result in a loss of trust and coalition between stewards and nonfamily blockholders (Davis et al., 1997).

Third, nonfamily blockholders may also negatively affect firm identity and family-to-firm unity of family stewards after going public. As nonfamily blockholders may start increasing their monitoring efforts in family firms and influence financial decision-making on firm management level after going public (Lee & O'Neill, 2003), the relationship and mutual understanding between family stewards and the firm may deteriorate as they are no longer single decision-makers, or, at the least, financial decisions may not be longer made in a uniform and collectivistic way. Weaker family-firm relationships may thereby adversely affect steward commitment and firm identity (Eddleston et al., 2010). In combination with increased public visibility and reputational concerns in publicly held firms (Hsu et al., 2010), family stewards may be more inclined to compromise with nonfamily blockholder interests on firm identity and values in a public ownership setting, compared to a private ownership setting, to avoid conflicts of interest and increasing distrust between stewards and nonfamily blockholders.

In sum, we posit that nonfamily blockholders will negatively affect long-term orientation, autonomy and empowerment, as well as firm identity. We conjecture that nonfamily blockholder ownership will be negatively related to the change in post-IPO financial stewardship within newly public family firms (H2).

HYPOTHESIS 2 (H2): Within newly public family firms, nonfamily blockholder ownership will be negatively related to the change in post-IPO financial stewardship.

2.2.1 Financial stewardship and family influence

Finally, we explore two different dimensions of family influence in family firms along the contingencies of family management and family ownership (Le Breton-Miller & Miller, 2009). As a first dimension, we explore the impact of family management on the relationship between nonfamily blockholder influence and the change in post-IPO financial stewardship, along the dimensions of long-term orientation, autonomy and empowerment as well as firm identity. First, family firms with multiple family members involved in the management tend to be increasingly concerned about the longevity of the family firm (Miller et al., 2008) which should support the long-term orientation in newly public family firms. In situations where nonfamily blockholders can pressurize family stewards to apply a more-short term horizon, in particular after going public, financial stewardship may be best facilitated and ensured when multiple family members are present in firm management. Second, family managerial involvement, i.e., the extent to which family members are involved in the active management of the family firm, allows the founding family to directly exert influence over financial decisions which should elevate the autonomy and empowerment of family stewards against the backdrop of exacerbated nonfamily blockholder influence (Miller et al., 2007). In addition, board compositions with a higher proportion of family members can support board cohesion (Anderson & Reeb, 2004) as well as family belonging (Ashforth & Mael, 1989), allowing the family to pursue its family-specific financial interest despite the transformational change event of going public and conflicts of interest with nonfamily blockholders. As nonfamily shareholders may influence financial decision-making in newly public family firms, strong and cohesive family boards may mitigate potential conflicts of interests that would otherwise compromise financial stewardship interests of family stewards (Le Breton-Miller & Miller, 2009). Eddleston et al. (2010) and Eddleston and Kellermanns (2007) suggest that pro-organizational behavior is best supported in situations where cooperation and participation in family firm management is salient. A larger proportion of family members may support such a participative strategy process when family members are able to successfully work together (Eddleston & Kellermanns, 2007). Third, emotional attachment to the firm (Bubolz, 2001) may empower and motivate family owners to align the management interests with the family

ownership to enable pro-organizational behavior (Madison et al., 2016; Miller et al., 2008). Following a stewardship logic, family members have higher value commitments and stronger stewardship perceptions, compared to nonfamily members (Davis et al., 2010; Beehr et al., 1997). Because identity is a result of social interaction (Stryker, 1980), a higher proportion of family members in firm management should reinforce family identity in newly public family firms. Thus, a large proportion of family members present in family management may lead to higher levels of value identification and goal alignment as more family members can exert influence on financial decisions. This in turn may make it harder for nonfamily blockholders to assert power and change firm identity after going public. Higher value identification implies that family firms can continue to pursue family-specific financial interests after going public, such as pursuing risky investments and reinvesting dividends (Le Breton-Miller et al., 2011).

For those reasons, we hypothesize that the proportion of family members involved in the firm's management will have a positive influence on the relationship between nonfamily blockholder influence and the change in post-IPO financial stewardship within newly public family firms (H3).

HYPOTHESIS 3 (H3): Within newly public family firms, the proportion of family managerial involvement will positively moderate the relationship between nonfamily blockholder ownership and the change in post-IPO financial stewardship.

A second dimension of family influence is family firm ownership (Le Breton-Miller & Miller, 2009; Gomez-Mejia et al., 2007). First, while some newly public family firms may be confronted with a loss of family ownership (Leitterstorf & Rau, 2014), retained family ownership may allow families to exert influence over financial decision-making to ensure the longevity and long-term orientation in financial investments necessary for stewardship-like behavior, even after going public (Miller et al., 2008; Zahra

et al., 2008). Newly public family firms which retain a larger portion of family ownership may have a more accentuated financial and socioemotional attachment to the business (Gomez-Mejia et al., 2007) and thus may have a positive effect on financial stewardship behavior. As family stewards may experience increased pressure to focus on shorter time horizons by the public market and nonfamily blockholders after going public, retained family ownership may offer safeguard to sustain long-term investment horizons, frequently observed in privately held family firms (Neckebrouck et al., 2018; Miller et al., 2008). In contrast, as family ownership declines, a family's financial wealth embedded in the firm also decreases which can reduce a family owner's tendency to act in the financial long-run interests of the firm and may make stewards more susceptible to nonfamily blockholder influence (Miller et al., 2008; Morck & Yeung, 2003). In other words, while nonfamily blockholders may employ strategies that focus on short-term performance and profit maximization (Wang & Song, 2016; Lee & O'Neill, 2003), family shareholder may intend to continuously emphasize long-term investments (Anderson & Reeb, 2004), which can act as a balancing power to ensure high levels financial stewardship. Second, family ownership should also positively contribute to sustained autonomy and empowerment of family stewards after going public. Family ownership may allow families better align family interests between principals and family stewards (Villalonga & Amit, 2006). In such situations, family stewards may retain support from influential family principals, who can buttress autonomy and empowerment of family stewards with motives and values being closely aligned (Villalonga et al., 2015). Large family owners have abilities and incentives to monitor firm management in a collectivistic way based on mutual understanding and trust, rather than driven by distrust (Davis et al., 1997). Third, family ownership may support firm identity of family stewards in newly public family firms. Because, given their family ties, values and goals between family blockholders and family stewards should be more closely aligned (Villalonga et al., 2015), firm identity may therefore be more present in family firms with high family ownership. Because self-identification of stewards to a group of principals is an important determinant of developing pro-organizational behavior (Davis et al., 1997), high family ownership should positively moderate the negative influence of nonfamily blockholder ownership on the change in post-IPO financial stewardship. In addition, high

family ownership implies stronger involvement in financial decision-making because more financial and socioemotional wealth is at stake (Gomez-Mejia et al., 2007) and thus potentially also higher levels of (reciprocal) firm identity. In these situations, the social interactions within the family group (Stryker, 1980) may be particularly strong, and as a result firm identity may be more pronounced.

In sum, we suggest that family ownership retained after going public will have a positive influence on the relationship between nonfamily blockholder influence and the change in post-IPO financial stewardship within newly public family firms (H4).

HYPOTHESIS 4 (H4): Within newly public family firms, family ownership will positively moderate the relationship between nonfamily blockholder ownership and the change in post-IPO financial stewardship.

3 SAMPLE & METHOD

3.1 Sample

To test our hypotheses, we draw on an initial sample frame based on 684 U.S. IPOs completed between 2004 and 2007 compiled from the Ritter IPO database (Loughran & Ritter, 2004). Our sample time frame spans multiple years to account for the cyclicity patterns of IPOs (Arthurs et al., 2008). We restrict the time frame to these years to avoid potentially confounding effects from the Internet Bubble before 2004 as well as from the Financial Crisis starting in 2008 (Leitterstorf & Rau, 2014). We merge the data from the Ritter IPO database with selected information from the SDC Platinum database (Lungeanu & Zajac, 2016)³⁹. Following existing IPO research, we exclude ADRs,

³⁹ The Ritter database has been widely used in management research and is considered a reliable source for studying IPOs (Chadwick et al., 2016; Lungeanu & Zajac, 2016). Since we further require IPO information only available from the SDC Platinum database, we followed research such as by Lungeanu and Zajac (2016) and merge information of the two databases rather than to solely rely on the SDC database.

closed-end funds, REITs (e.g., Chadwick et al., 2016; Acharya & Pollock, 2013). We require firms to be available on the Compustat database to append firm financial data. Further, we restrict our sample to firms where we can obtain least two years of pre-IPO financial information to calculate the change in financial stewardship after going public. We collect private (i.e., pre-IPO) financial information from the Compustat database which contains both private and public financial information. On average, the Compustat database reports 2.6 years of private (i.e., pre-IPO) financial years for the firms in our sample. We track all IPO firms for a maximum of five year after going public because firms can be considered as newly public during the initial five years following their IPO (Acharya & Pollock, 2013; Ragozzino & Reuer, 2012; Kroll et al., 2007). We allow firms to delist during the post-IPO observation period and drop such cases from the sample after delisting occurred (Acharya & Pollock, 2013). Following prior IPO studies, we exclude small firms which raised less than USD 5 million during the IPO as well as firms with sales of less than USD 20 million because financial disclosure requirements for these small firms are less stringent and thus financial information may be not reliable (Chadwick et al., 2016). We also exclude financial services firms and public utility firms since federal regulations can affect large shareholder ownership structures (Anderson & Reeb, 2004). Our final sample includes 533 newly public firms comprising 2'480 firm-year observations.

3.2 Dependent variable

In this study, we define our focal dependent variable, i.e., “post-IPO financial stewardship”, as the difference between the mean of the firm’s pre-IPO financial stewardship⁴⁰ and the firm’s financial stewardship for the five years after going public. We use a five-year horizon after the public offering since firms are generally considered newly public during this time, and as seasoned firms after that (e.g., Acharya & Pollock, 2013; Ragozzino & Reuer, 2012). Further, we use a difference measure for our dependent variable to capture the relative change in financial stewardship prior and after going public.

⁴⁰ As explained in Section 3.1, the Compustat database on average provides 2.6 years of pre-IPO financial information, from which we calculated the firm’s mean pre-IPO financial stewardship.

Thereby, we capture financial stewardship in two distinct organizational contexts, i.e., the private and public ownership setting. An important benefit of using such a relative measure is that unobservable, firm-specific effects, that could potentially confound our results are being neutralized (Chang & Shim, 2015). In our main analysis, we adopt the methodology as in Neckebrouck et al. (2018) and derive our measure of financial stewardship as a composite index of three different financial components.

First, we include the sum of capital expenditures and investments in research and development (R&D) to proxy farsighted managerial skills and managerial long-term investment orientation (Miller et al., 2008). We calculate the investment ratio as the sum of R&D expenses and capital expenditures divided by total assets. Second, retained dividends gauge the amount of net earnings not distributed to shareholder and thus money that is available for internal funding (Le Breton-Miller et al., 2011). We measure the amount available for firm-internal financing as 1 minus the ratio of total dividends to total earnings. Third, risk tolerance proxies venture risk and a firm's ability to finance risky projects as well its willingness to tolerate fluctuating income streams. We calculate risk tolerance as the coefficient of variation of a firm's earnings before interest, taxes, depreciations, and amortizations⁴¹. All of our measures are based on firm-level, fiscal-year financial information over a period of a maximum of five reporting years.

We standardize these three variables and aggregate them to create a financial stewardship composite index (see Appendix B for a summary of our composite index). We standardize the individual components to avoid that differences in ranges and types of the measures potentially influence our composite index (Neckebrouck et al., 2018; Le Breton-Miller et al., 2011).

3.3 Independent variables

For Hypothesis 1, we use a dichotomous variable, labelled "family firm", to measure the impact of family presence on the change in financial stewardship. Following existing research (Gomez-Mejia et al., 2018; Chrisman & Patel, 2012; Villalonga & Amit, 2006),

⁴¹ The coefficient of variation calculates the extent of variability relative to the mean of the sample population (see e.g., Neckebrouck et al., 2018; Miller et al., 2002).

we use a composite index for our family firm definition and define a family firm as a firm where the founding family controls at least 5% of the firm and has at least one member of the family involved in the management. To identify ownership and management of the IPO firms, we manually consult these SEC filings filed by the individual IPO firms (Chadwick et al., 2016; Liu et al., 2014; Acharya & Pollock, 2013) and hand-collect detailed firm-level information to determine the ownership and management structure of each IPO firm at the time of the IPO.

For Hypotheses 2-4, where we use a subsample that comprises newly public family firms, we use “nonfamily blockholders” as our continuous, independent variable. We define the variable as the total firm ownership of all 5% blockholders that do not belong to the founding family after going public (Le Breton-Miller et al., 2011; Anderson & Reeb, 2003). To identify nonfamily blockholders, we consult the IPO prospectus of each family firm and manually identify the shareholder structures for all nonfamily shareholders with at least 5% firm ownership after the IPO (Le Breton-Miller et al., 2011). Since nonfamily blockholders may have been invested in the firm prior to going public, we also use a control continuous variable labelled “pre-IPO nonfamily blockholders”. Importantly, we do not include nonfamily blockholder ownership in our model for Hypothesis 1 since our focus is to investigate the influence of nonfamily blockholders on financial stewardship only within the subsample of family firms, where principal-principal conflicts are particularly salient (Villalonga et al., 2015).

3.4 Moderator variable

For Hypotheses 2 to 4, where we focus on the subsample of newly public family firms, we use two moderator variables to analyze different dimensions of family influence in family firms. First, we define “family management involvement” as the percentage of family members involved in the active management of the firm (Anderson & Reeb, 2004). Second, we define “family ownership” as the percentage of ownership retained by the family after going public (Kotlar et al., 2017).

3.5 Control variables

Our regression analysis includes two sets of control variables. The first set of controls comprises five firm-level variables. We include “firm size” measured as the natural logarithm of the total number of employees (Neckebrouck et al., 2018; Gulati & Higgins, 2003), “firm leverage” calculated as the total of long-term debt divided by total assets (Kotlar et al., 2017), “capital intensity” defined as the natural logarithm of the ratio of the firm’s fixed assets to the number of its employees (Neckebrouck et al., 2018), “firm age” measured as the number of years since the firm was founded (Gulati & Higgins, 2003) as well as a dichotomous variable labelled “dual class share” which equals 1 if the firm has a dual class share structure, and 0 otherwise. For Hypotheses 2 to 4, we also control for “pre-IPO nonfamily blockholders” which we define as a continuous variable measured as the total ownership of nonfamily 5% blockholders prior to going public according to the IPO prospectus⁴².

The second set of control variables accounts for characteristics centered around the IPO process and comprises five variables. We include a dummy variable labeled “family shares sold” which equals 1 if the founding family sold shares during the offering process, and 0 otherwise. We also include “IPO size” measured as natural logarithm of the total capital raised at the IPO (Acharya & Pollock, 2013) as well as three categorical variables labeled “IPO underwriters” (Kotlar et al., 2017), “IPO share type” as well as “high-tech industry” (Reuer & Tong, 2010).

Lastly, in all of our models we control for industry-level heterogeneity by including industry fixed effects as well as year fixed effects to rule out effects caused by economy-wide factors during the five-year observation period of our panel data set (see Appendix F for an overview of variable descriptions).

⁴² In unreported results, we also add firm profitability, measured as return on equity (ROE) and alternatively as return on asset (ROA) as part of our firm-level control vectors since firm profitability potentially influences firm strategic behavior and thus financial stewardship. Our results remain similar.

3.6 Analytical method

We analyze the data using moderated hierarchical multiple regression analysis. To control for serial correlation and heteroskedasticity, we use Huber-White sandwich estimators clustered at the industry-year level. To reduce the potential influence of outliers, we winsorize all continuous variables at the 1st and 99th percentile. As we include continuous variables in our moderated regression models, multicollinearity may pose a problem (Levitas & Chi, 2010). To alleviate issues related to multicollinearity in our models, we center all our independent and moderator continuous variables around the mean for the interaction equations. We address the use and applicability of alternative estimation methods our supplementary analyses in Chapter 5.

4 RESULTS

Table 1 provides the descriptive statistics of our sample. For the sake of space and clarity, the tables do not include three categorical variables (i.e., IPO underwriters, IPO share type and hightech industry) and year and industry dummies, although we include them in our regression models. To facilitate interpretation, we calculate means and standard deviations using raw data, while log-transformed values as described in Chapter 3 are used for our regression models. Table 1 reports that post-IPO financial stewardship is negative (column 1), suggesting that financial stewardship in newly public firms overall decreases, compared to pre-IPO financial stewardship levels. Furthermore, post-IPO financial stewardship, measured as the relative change in financial stewardship after an IPO, compared to pre-IPO levels, is significantly lower for newly public family firms, compared to newly public nonfamily firms ($p < 0.01$). The results in Table 1 also show that newly public family firms are significantly smaller ($p < 0.001$), less leveraged ($p < 0.001$) and less capital intense ($p < 0.001$), compared to newly public nonfamily firms. The average year of IPO family firms was 15.5 years, in line with previous family firm IPO research (Kotlar et al., 2017). Regarding family firm heterogeneity, Table 1 further reports that family members on average held 16.2% of all seats in management boards and retained 25.5% ownership after going public. Lastly, the combined ownership of

nonfamily blockholders in newly public family firms was 30.0% on average after going public.

[insert Table 1 about here]

Panel A of Table 2 provides an overview of financial stewardship prior to and after going public. The results show that financial stewardship is significantly higher in private family firms (i.e., prior to an IPO), compared to private nonfamily firms ($p < 0.01$), corroborating existing research (Neckebrouck et al., 2018). After going public, Panel A of Table 2 shows that financial stewardship decreases for both newly public family and newly public nonfamily firms (see also Appendix C). Panel B to D of Table 2 report the results for the individual components of the financial stewardship index prior and after going public. In Panel B of Table 2, capital expenditures and R&D investments are significantly higher ($p < 0.001$) in private family firms, compared to private nonfamily firms and decreases for both groups after a public offering, relative to pre-IPO levels. In Panel C of Table 2, retained dividends are also significantly higher ($p < 0.01$) in private family firms, compared to private nonfamily firms, but tends to increase after going public for both groups. Lastly, Panel D of Table 2 reports that risk tolerance is higher ($p = n.s.$) in private family firms compared private nonfamily firms and seems to decrease in family firms after going public, while a comparable effect is not observed in newly public non-family firms

[insert Table 2 about here]

Table 3 reports the results of our moderated hierarchical regression models. Model I only includes control variables as described in Chapter 3. Model II includes our main independent variable, family firm, to estimate the impact of family firm presence on post-IPO financial stewardship in newly public firms. Model II shows that family firm

presence is negatively and significantly related to post-IPO financial stewardship in newly public firms ($\beta = -0.0549$, $p < 0.01$), which confirms Hypothesis 1. In Model III to VI, we analyze family firm heterogeneity and use a subsample of newly public family firms. Model III includes control variables for our family firm subsample analysis. In Model IV we add our independent variable, nonfamily blockholder. Model IV shows that the coefficient is negative and significant ($\beta = -0.3540$, $p < 0.001$). We thus confirm Hypothesis 2 which suggests that, within newly public family firms, nonfamily blockholder ownership has a negative effect on post-IPO financial stewardship. In Model V and Model VI, we add two interaction terms to investigate the moderating effect of family influence on the relationship between nonfamily blockholder ownership and post-IPO financial stewardship. First, Model V reports a positive and significant interaction term between nonfamily blockholder ownership and family management involvement ($\beta = 0.0665$, $p < 0.001$), which confirms Hypothesis 3. Second, Model VI shows that the interaction term between nonfamily blockholder ownership and family ownership is positive and significant ($\beta = 0.0645$, $p < 0.05$), lending support to our theoretical predictions in Hypothesis 4.

[insert Table 3 about here]

5 SUPPLEMENTARY ANALYSIS

In our supplementary analysis, we test the robustness of our main results in several ways. First, we use an alternative measure of financial stewardship. Initially, with our definition of financial stewardship, we followed Neckebrouck et al. (2018) and used a composite index of three different variables. To ensure robustness, we rerun our regression using an alternative measure of financial stewardship as in Le Breton-Miller et al. (2011). We calculate financial stewardship as a composite index of five different variables to proxy farsighted financial management (see Appendix D for a summary of the composite index). For this composite measure, we include R&D expenses, calculated as the ratio of R&D expenses to total sales. Second, we include capital expenditure to proxy

managerial long-term orientation in firm infrastructure, calculated as the ratio of capital expenditures to the total investments in property, plant and equipment. Third, cash & cash equivalents reflect flexible funding available for firm-internal project investments, which we calculate as cash plus short-term investments as a percentage of the sum of property, plant and equipment. Fourth we include retained earnings, measured as 1 minus total dividends to earnings. Fifth, we include risk tolerance, calculated as coefficient of variation of a firm's earnings before interest, taxes, depreciations, and amortizations. All ratios are calculated using firm-level, fiscal-year financial information. In Table 4, we test our hypotheses using this alternative measure of financial stewardship. Our results remain stable with one exception for Hypothesis 4, where we find a positive but insignificant moderating effect of family ownership on the relationship between nonfamily blockholder ownership and post-IPO financial stewardship.

[insert Table 4 about here]

Second, we analyze the individual components of financial stewardship to examine conflating effects within our composite index. Thus, we test our hypotheses for each of the three components individually, which constitute our financial stewardship index⁴³. In Table 5, we rerun Hypothesis 1, where we compare family firms and nonfamily firms, on the three individual components. Table 5 reports that newly public family firms display a larger decrease for all three individual components post-IPO relative to pre-IPO levels, compared to newly public nonfamily firms.

[insert Table 5 about here]

⁴³ As for our composite index, we use a relative measure to calculate the individual components after going public. Specifically, we calculate the difference between the mean of the firm's pre-IPO level and the firm's post-IPO level for the five years after going public for any given index component.

We also test Hypotheses 2 to 4, where we use a family firm subsample to analyze aspects of family firm heterogeneity, on the three individual components of our financial stewardship composite index. In Panel A of Table 6 we find consistent results for both capital and R&D expenditures as well as retained dividends (columns 1 and 2). Specifically, nonfamily blockholder ownership has a significantly negative effect on the change in post-IPO capital and R&D expenditures and post-IPO retained dividends, whereas family managerial involvement has a positive moderating effect on the relationship between nonfamily blockholder ownership and a change in post-IPO capital and R&D expenditures and a change in post-IPO retained dividends, respectively. In contrast, for our measure of risk tolerance (column 3), we do not find significant evidence. It is possible that for our context, our measure of risk tolerance rather reflects an exogenous factor to financial stewardship and may not solely be a result of deliberate financial decision-making (Le Breton-Miller et al., 2011). Consistent with Panel A, our results in Panel B of Table 6 show that nonfamily blockholder ownership has a significantly negative effect on the change in post-IPO capital and R&D expenditures and post-IPO retained dividends in newly public family firms (column 1 and 2). Family ownership has a positive moderating effect on the relationship between nonfamily blockholder ownership and a change in post-IPO capital and R&D expenditures and a change in post-IPO retained dividends, respectively. In line with our findings in Panel A, we do not find a significant relationship with respect to our measure of post-IPO risk tolerance (column 3).

[insert Table 6 about here]

Third, to ensure robustness of our independent variable in Hypothesis 3, we use three alternative measures of family managerial involvement in family firms (e.g., Le Breton-Miller et al., 2011). First, we use the number of family executives relative to the executive team size, labeled “family executive influence”, to assess the proportional family influence on an executive level. Second, we use the number of family directors

relative to the size of board of directors, labeled “family board influence” to gauge the proportional family influence on the board level. Third, we use a dichotomous variable labelled “family CEO” to estimate the influence of Family CEO presence on post-IPO financial stewardship in newly public family firms. In Table 7, we find that our results are robust using family executive and board managerial influence (Model I and II). In contrast, we find a positive, however insignificant effect for our Family CEO variable to gauge family managerial influence (Model III).

[insert Table 7 about here]

Fourth, we address potential endogeneity concerns arising from our empirical strategy. First, we address issues related to unobserved heterogeneity. As Le Breton-Miller et al. (2011) point out, certain firm characteristics, such as firm size and firm age may affect financial stewardship behavior in family firms. While we control for various firm characteristics, including size and age, in our main analysis, we cannot rule out that a systematic bias in our sample may affect our results. Thus, we employ a Propensity Score Matching (PSM) procedure of newly public family and newly public nonfamily firms without replacements (Neckebrouck et al., 2018). PSM lowers the influence of unobserved heterogeneity in our sample and reports more conservative estimates than OLS regression estimates (e.g., Bird & Zellweger, 2018; Dehejia & Wahba, 2002). As covariates, we include firm age, firm size, capital intensity, industry and year. Since we employ a PSM approach without replacement, our sample size is reduced to 1,352 firm-year observations. On the matched sample, we first run a balancing test of covariates to ascertain that our matched sample is well-balanced. In unreported balancing tests, t-tests for our covariates on the matched sample show that the differences in mean for our covariates are insignificant between newly public family and newly public nonfamily firms, except for firm size with marginal significance ($p < 0.1$). In a second step, we test

Hypotheses 1 to 4 on the matched sample. All predicted significant results in Hypotheses 1 to 4 were replicated at beyond the 0.05 level or better⁴⁴.

Second, endogeneity concerns may also arise as a result of self-selection bias as we can only observe family firms that have already decided to go public (hence they are public). In addressing self-selection bias, we apply a two-step Heckman model (Heckman, 1976) to evaluate whether sample selection bias may be present in our sample (Certo et al., 2016; Hamilton & Nickerson, 2003). Following previous research, we predict whether entrepreneurs decide to go public (i.e., IPO choice) versus selling the firm to an external buyer and thereby give up control of their firm (i.e., M&A choice) (Kotlar et al., 2017; Bayar & Chemmanur, 2012). We gather data from the SDC M&A database and construct a separate database comprising 1,191 U.S. private firms which were acquired between 2004 to 2007. Thus, our M&A data covers the same time period and country as for our IPO sample (Kotlar et al., 2017). We then combine the IPO and M&A sample using three firm characteristics (i.e., size, leverage and age) as well as a proxy for M&A intensity. We follow Kotlar et al. (2017) and calculate M&A intensity as the total number of M&A deals per year and industry divided by the total number of M&A deals per industry. Using these four independent variables we then run a probit regression to calculate the likelihood of going public. Based on the probit regression, we calculate the inverse Mills ratio. Importantly, we transform our panel data of newly public firms used in our main analysis to a cross-sectional design to be able to model the likelihood of going public in the first stage of going public and to estimate the inverse Mills ratio (Heckman, 1976). We therefore calculate mean values for our continuous variables over a maximum of five years after going public. In untabulated results, we find that the inverse Mills ratio is insignificant and thus no evidence for sample selection bias (Certo et al., 2016; Kennedy, 2006; Heckman, 1976)⁴⁵.

Fifth and finally, we conduct several analyses of our model specifications. For example, we exclude newly public firms with a dual class share structure (Leitterstorf & Rau, 2014). We also restrict our sample to only include firms which have at least three

⁴⁴ Results are available upon requests.

⁴⁵ Results are available upon request.

years of pre-IPO financial information and constrain the sample to different time periods after the public offering (e.g., 3 or 4 years after going public). We further test the robustness of our results by modifying our sets of control vectors in the model specification. For example, we use the natural logarithm of total assets to proxy firm size (Le Breton-Miller et al., 2011). We also use a dichotomous variable to gauge high-tech industry intensity instead of using a categorical variable. Instead of measuring IPO size as the total capital raised, we alternatively use the total number of shares offered to alleviate concerns that underpricing in family firms may avertedly affect our measure of total capital raised (Leitterstorf & Rau, 2014). To ensure that our results are not driven by outliers of our control variables, we additionally winsorize the continuous variables at the 5th and 95th percentiles of their distributions. Our results remain similar and are available upon request.

6 DISCUSSION

Conceding to stewardship theory, family owners are good financial stewards (Davis et al., 2010; Davis et al., 1997). As they often have substantial equity stakes in the family firm (Miller et al., 2008; Anderson & Reeb, 2004), personally identify themselves with the business (Deephouse & Jaskiewicz, 2013; Zellweger et al., 2011) and may intend to ensure family control over multiple generations (Zellweger et al., 2012), there is a multitude of convincing arguments that, under stewardship assumptions, family firms have strong incentives to commit long-term investments, forgo short-term profits and, as a consequence, display particularly high levels of financial stewardship. Research provides mixed evidence whether family owners are good financial stewards is mixed (Neckebrouck et al., 2018; Le Breton-Miller et al., 2011).

In this study, we compare how a change in the organizational context affects financial stewardship in newly public family firms, to that of newly public nonfamily firms. Our main thesis is that the extent to which firms display stewardship behavior, in part, depends on the organizational context, such firms are embedded in. We build on stewardship theory, suggesting that, for stewards to display pro-organizational and

collectivistic behavior, a firm's organizational context must also be designed in a way that enables such behavior (Davis et al., 1997; Donaldson & Davis, 1991; Donaldson, 1990). What follows is that family firms may not be unequivocally good financial stewards, but that their stewardship behavior is contingent on the firm's organizational context, a notion that has been acknowledged in family firm research but whose mechanisms have not yet been examined (e.g., Neckebrouck et al., 2018; Madison et al., 2016; Le Breton-Miller et al., 2011; Miller et al., 2008). Conceptually, we propose two forms of organizational contexts, one in which stewardship behavior in family firms is enabled and supported (i.e., stewardship enabling), and another in which stewardship behavior is hindered and compromised (i.e., stewardship hindering). In an organizational context in which stewardship is enabled, long-term orientation as well as autonomy and empowerment of family stewards should be strongly supported (Miller et al., 2008; Donaldson, 1990) and firm identity should be present and actively nurtured (Davis et al., 2010; Edleston et al., 2010). We investigate our hypotheses using a sample of 533 newly public firms in the United States where firms transition from a private (stewardship enabling) to a public (stewardship hindering) ownership setting.

Our main hypothesis tests whether newly public family firms display a larger decrease in post-IPO financial stewardship, compared to newly public nonfamily firms. We find empirical evidence that the decrease in post-IPO financial stewardship is stronger in newly public family firms, compared to newly public nonfamily firms, suggesting that newly public family firms suffer more in terms of financial stewardship, compared to newly public nonfamily firms. Further, our results offer support to the notion that nonfamily blockholders may have significant influence over financial decision-making in family firms (Cacciotti & Ucbasaran, 2018; Fattoum-Guedri et al., 2018) and on financial stewardship behavior in particular (Le Breton-Miller et al., 2011). The empirical results show that nonfamily blockholder ownership has a significantly negative effect on the change in post-IPO financial stewardship in newly public family firms, shedding light on the exacerbation of conflicting interest between founding families and nonfamily blockholders in general (Anderson & Reeb, 2004), and after going public in particular (Bruton et al., 2010; Fischer & Pollok, 2004). Long-term investment horizons,

a desire for autonomy and empowerment of family stewards and a deep roots in firm identity, which support stewardship-like behavior (Le Breton-Miller et al., 2011; Davis et al., 1997), may be in conflict with nonfamily blockholders interests, which often amplify once a family firm went public (Lee & O'Neill, 2003). Monitoring efforts by nonfamily blockholders (Leitterstorf & Wachter, 2016; Anderson & Reeb, 2004) may intensify after a public offering which has deleterious effects on financial stewardship behavior, which generally promotes empowerment and mutually trustful relationships rather than monitoring and distrust (Eddleston et al., 2010). While our results suggest that newly public family firms with strong nonfamily blockholders suffer more in terms of post-IPO financial stewardship, compared to newly public family firms with weak nonfamily blockholders, our findings also show that family management involvement and ownership may, at least in part, weaken the negative effects of nonfamily blockholder presence on the change in post-IPO financial stewardship, thereby allowing newly public family firms to continue emphasizing and exerting stewardship-like behavior. Indeed, family owners may partially balance nonfamily blockholder interests in newly public family firms to uphold an involvement-oriented and collectivistic environment, and thereby stewardship-like behavior (Miller et al., 2008), either directly through managerial involvement in the management boards or through large ownership stakes in the family firm.

Our work offers contributions to both stewardship theory as well as family business literature. First, we conceptually and empirically investigate stewardship theory by examining the transitional effects of organizational changes on financial stewardship behavior in family firms. While research supports the notion that the organizational context is an important determinant of stewardship behavior in family firms (e.g., Madison et al., 2016; Le Breton-Miller et al., 2011; Miller et al., 2008), to the best of the authors' knowledge, research has not empirically examined this question nor has there been an attempt to conceptually reconcile transitional effect of changes in organizational contexts on financial stewardship in family firms. This is surprising as stewardship theory highlights that stewardship behavior may only emerge in organizational environments that enable and nurture such behavior (Davis et al., 1997; Donaldson, 1990). Second,

we contribute to family business literature by drawing a theoretical distinction between private and public ownership settings and its effects on financial stewardship behavior. Scholars, such as Madison et al. (2016), Le Breton-Miller et al. (2011) and Miller et al. (2008; 2007) suggest that an important distinction in family firm stewardship literature is whether family firms are held privately or publicly listed. Our study aims to directly address their suggestions. We extend existing research which has investigated financial stewardship in specific organizational contexts and reconcile seemingly contradicting empirical findings on financial stewardship in family firms (Neckebrouck et al., 2018; Le Breton-Miller et al., 2011). As we control for pre-IPO financial stewardship levels, we aim to portray a more nuanced view on how the organizational context may affect financial stewardship in family firms. Consequentially, the notion that family firms per se are good financial stewards would have to be treated with caution. Rather, our results suggest that for stewardship behavior to emerge and prevail in family firms, the organizational environment and structure should also be designed to enable such behavior. Support for long-term investment orientation, managerial structures that enable autonomy and empowerment of family stewards and the nurturing of family identity may all be aspects which contribute to stewardship in a private ownership setting. Third, we add to the growing literature focusing on the importance of nonfamily blockholders in family firms (Cacciotti & Ucbasaran, 2018; Fattoum-Guedri et al., 2018; Leitterstorf & Wachter, 2016) and thereby provide a particular perspective on potential financial stewardship drivers in family firms. Nonfamily blockholders can significantly influence strategic decisions (Maury, 2006; Anderson & Reeb, 2004) and thereby may also alter stewardship-like financial behavior in family firms. Indeed, as our findings indicate, nonfamily blockholders can have a significantly negative influence on the change in post-IPO financial stewardship within newly public family firms. In other words, newly public family firms with strong nonfamily blockholder presence seem to be more prone to display financial behavior that emphasizes short-term financial gains, an aversion to invest in research and development as well as reduced risk tolerance, relative to pre-IPO levels. Such financial behavior, however, is in stark contrast with stewardship-like, pro-organizational behavior, which research suspects to be present in family firms. Our findings are important because for stewardship behavior to prevail, a functioning coalition

between stewards and principals based on empowerment and mutual trust is paramount, while conflicts of interests and distrust can have deleterious effects on financial stewardship (Donaldson, 1990; Cyert & March, 1963). Our results highlight the notion that conflicts between family and nonfamily blockholders may adversely affect the organizational environment and therefore financial stewardship behavior in family firms and that such conflicts of interest particularly frequently emerge after a public offering (O'Neil & Lee, 2003).

We identify several limitations that should be considered for our study and provide fruitful avenues for future research. First, our sample only includes listed firms in the United States which tends to represent large, dispersedly held firms, compared to other institutional settings (La Porta et al., 1999). Future research could investigate how different institutional contexts affect financial stewardship in family firms. For example, smaller firms tend to be under less public scrutiny than large firms (Anderson & Reeb, 2004) and thus transitional effects from private to public ownership on financial stewardship may differ. In addition, power mechanisms in small and large firms can vary substantially, which may have an influencing effect on mitigating diverging interest between family owners and large, nonfamily blockholders (Bennedsen & Wolfenzon, 2000). Second, we investigate the effects of going public on financial stewardship by conceptually disentangling stewardship behavior in three key components (i.e., long-term orientation, autonomy and empowerment and firm identity), but, given our dataset, do not empirically test each component separately. To accumulate a more detailed understanding of stewardship mechanisms, research could empirically investigate these individual components, for example through a survey approach. Third, we acknowledge that family ownership doesn't necessarily have to be a homogenous construct (Zellweger & Kammerlander, 2015). Families often involve multiple members and generations which may results in diverging interests within family firms itself, for example with respect to their identities with the family firm (Zellweger et al., 2011) or regarding their social embeddedness within the firm (Bird & Zellweger, 2018). Future research could take into consideration how diverging interests between a group of family blockholders may affect their predisposition towards exerting financial stewardship-like behavior in

family firms. Fourth, a lack of more fine-grained data on nonfamily blockholder structure does not allow us to discern different types of nonfamily blockholders (Fattoum-Guedri et al., 2018; Hoskisson et al., 2002). However, as different nonfamily blockholders may vary with respect to their motives and intentions (Leitterstorf & Wachter, 2016), future studies may shed more light on how specific types of nonfamily blockholders can affect financial stewardship in family firms. Lastly, in our theoretical framework for Hypothesis 2 to 4, we focus on diverging conflicts of interests between family and nonfamily blockholders (Hoskisson et al., 2002; Bennedsen & Wolfenzon, 2000), because such principal-principal conflicts primarily arise in family firms. However, it may be interesting to investigate whether blockholders overall have a different effect on financial stewardship in nonfamily firms, compared to family firms. Since our model assumes that the coalition between the family and nonfamily blockholders deteriorates after a public offering, research could investigate if and how strong blockholder presence of different shareholder types affects financial stewardship in other firms after going public.

7 CONCLUSION

While stewardship theory suggests that family firms are good financial stewards (Davis et al., 2010; Donaldson, 1990), empirical evidence is inconclusive (Neckebrouck et al., 2018; Le Breton-Miller et al., 2011). Our study suggests that the organizational context, in which family firms are embedded in, is an important determinant to what extend financial stewardship behavior in family firms can emerge and prevail. In organizations in which stewardship behavior is actively supported and nurtured, such behavior should be visible (Davis et al., 1997), while organizational contexts in which stewardship is hindered, an adverse effect may prevail. Our findings contribute to the discussion how organizational settings and governance arrangements affect financial stewardship behavior in family firms (Madison et al., 2016; Miller et al., 2008) and highlight the importance of nonfamily blockholders as a boundary condition to pro-organizational financial behavior in newly public family firms.

References

- Acharya, A.G. & Pollock, T.G. (2013). Shoot for the Stars? Predicting the Recruitment of Prestigious Directors at Newly Public Firms. *The Academy of Management Journal* **56**(5): 1396–1419.
- Anderson, R.C. & Reeb, D.M. (2004). Board Composition: Balancing Family Influence in S&P 500 Firms. *Administrative Science Quarterly* **49**(2): 209–237.
- Anderson, R.C. & Reeb, D.M. (2003). Founding-Family ownership and Firm Performance: Evidence from the S&P 500. *The Journal of Finance* **63**: 1301–1328.
- Arregle, J.L., Hitt, M.A., Sirmon, D.G. & Very, P. (2007). The Development of Organizational Social Capital: Attributes of Family Firms. *Journal of Management Studies* **44**(1): 73–95.
- Arthurs, J.D., Hoskisson, R.E., Busenitz, L.W. & Johnson, R.A. (2008). Managerial agents watching other agents: multiple agency conflicts regarding underpricing in IPO firms. *The Academy of Management Journal* **51**(2): 277–294.
- Ashforth, B. & Mael, F. (1989). Social identity theory and the organization. *Academy of Management Review* **14**(1) 20–39.
- Bayar, O. & Chemmanur, T.J. (2012). What drives the valuation premium in IPOs versus acquisitions? An empirical analysis. *Journal of Corporate Finance* **18**(3): 451–475.
- Beehr, T.A., Drexler, J.A. & Faulkner, S. (1997). Working in small family businesses: empirical comparisons to non-family businesses. *Journal of Organizational Behavior* **18**: 297–312.
- Bennedsen, M. & Wolfenzon, D. (2000). The balance of power in closely held corporations. *Journal of Financial Economics* **58**: 113–139.
- Bird, M. & Zellweger, T.M. (2018) Relational embeddedness and firm growth: Comparing spousal and sibling entrepreneurs. *Organization Science* **29**(2): 264–283.
- Bruton, G. D., Filatotchev, I., Chahine, S. & Wright, M. (2010). Governance, ownership structure, and performance of IPO firms: The impact of different types of private equity investors and institutional environments. *Strategic Management Journal* **31**: 491–509.
- Bubolz, M. (2001). Family as a source, user and builder of social capital. *Journal of Socio-Economics* **30**(2): 129–131.
- Cacciotti, G. & Ucbasaran, D. (2018). Commentary: Blockholder Structures and Power Mechanisms in Family Firms. *Entrepreneurship Theory and Practice* **42**(2): 252–258.
- Carney, M. & Gedajlovic, E. (2002). The coupling of ownership and control and the allocation of financial resources: evidence from Hong Kong. *Journal of Management Studies* **39**(1): 123–46.
- Certo, S.T., Busenbark J.R., Woo, H.S. & Semadeni, M. (2016). Sample selection bias and Heckman models in strategic management research. *Strategic Management Journal* **37**: 2639–2657.

- Certo, S.T., Daily, C.M. & Dalton, D.R. (2001). Signaling firm value through board structure: an investigation of initial public offerings. *Entrepreneurship Theory & Practice* **26**: 33–50.
- Certo, S.T., Holcomb, T.R. & Holmes, R.M. (2009). IPO research in management and entrepreneurship: Moving the agenda forward. *Journal of Management* **35**(6): 1340–1378.
- Chadwick, C., Guthrie, J. & Xing, X. (2016). The HR executive effect on firm performance and survival. *Strategic Management Journal* **37**(11): 2346–2361.
- Chang, S.J. & Shim, J. (2015). When does transitioning from family to professional management improve firm performance? *Strategic Management Journal* **36**(9): 1297–1316.
- Chrisman, J.J. & Patel, P.C. (2012). Variations in R&D investments of family and non-family firms: Behavioral agency and myopic loss aversion perspectives. *The Academy of Management Journal* **55**: 976–997.
- Corbetta, G. & Salvato, C. (2004). Self-serving or self-actualizing? Models of man and agency costs in different types of family firms: a commentary on “Comparing the agency costs of family and non-family firms: conceptual issues and exploratory evidence”. *Entrepreneurship Theory and Practice* **28**(4): 355–362.
- Cyert, R.M. & March, J.G. (1963). *A behavioral theory of the firm* (2nd ed.) Malden: Blackwell Publisher Inc.
- Davis, J.H., Allen, M.R. & Hayes, H.D. (2010). Is Blood Thicker Than Water? A Study of Stewardship Perceptions in Family Business. *Entrepreneurship Theory and Practice* **34**(6): 1093–1116.
- Davis, J.H., Schoorman, F.D. & Donaldson, L. (1997). Toward a stewardship theory of management. *The Academy of Management Review* **22**: 20–47.
- Deephouse, D.L. & Jaskiewicz, P. (2013). Do family firms have better reputations than non-family firms? An integration of socioemotional wealth and social identity theories. *Journal of Management Studies* **50**: 337–360.
- Dehejia, R.H. & Wahba, S. (2002). Propensity score-matching methods for nonexperimental causal studies. *Review of Economics and Statistics* **84**(1): 151–161.
- Donaldson, L. (1990). The ethereal hand: organizational economics and management theory. *Academy of Management Review* **15**: 369–381.
- Donaldson, L. & Davis, J. (1991). Stewardship theory or agency theory. *Australian Journal of Management* **16**: 49–64.
- Eddleston, K.A., Kellermanns, F.W. & Zellweger, T.M. (2010). Exploring the Entrepreneurial Behavior of Family Firms: Does the Stewardship Perspective Explain Differences? *Entrepreneurship Theory and Practice* **36**(2): 347–367.
- Fattoum-Guedri, A., Guedri, Z. & Delmar, F. (2018). Multiple Blockholder Structures and Family Firm Performance. *Entrepreneurship Theory and Practice* **42**(2): 231–251.
- Fischer, H.M. & Pollock, T.G. (2004). Effects of social capital and power on surviving transformational change: The case of initial public offerings. *The Academy of Management Journal* **47**(4): 463–481.

- Fitza, M. & Tihanyi, L. (2017). How Much Does Ownership Form Matter? *Strategic Management Journal* **38**(13): 2726–2743.
- Gersick, K.E., Davis, J.A., Hampton, M.M. & Lansberg, I. (1997). *Generation to generation: life cycles of the family business*. Boston: Harvard Business School Press.
- Gomez-Mejia, L.R., Haynes, K., Nunez-Nickel, M., Jacobson, K.J.L. & Moyano-Fuentes, J. (2007). Socioemotional wealth and business risks in family-controlled firms: evidence from Spanish olive oil mills. *Administrative Science Quarterly* **52**(1): 106–137.
- Gomez-Mejia, L.R., Patel, P. & Zellweger, T. (2018). In the Horns of the Dilemma: Socioemotional Wealth, Financial Wealth, and Acquisitions in Family Firms. *Journal of Management* **44**(4): 1369–1397.
- Gulati, R. & Higgins, M.C. (2003). Which Ties Matter When? The Contingent Effects of Interorganizational Partnerships on IPO Success. *Strategic Management Journal* **24**(2): 127–144.
- Hamilton, B.H. & Nickerson, J.A. (2003). Correcting for endogeneity in strategic management research. *Strategic Organization* **1**(1): 51–78.
- Heckman, J.J. (1976). The common structure of statistical models of truncation, sample selection and limited dependent variables and a simple estimator for such models. *Annals of Economic and Social Measurement* **5**(4): 475–492.
- Hoskisson, R.E., Hitt, M.A., Johnson, R.A. & Grossman, W. (2002). Conflicting Voices: The Effects of Institutional Ownership Heterogeneity and Internal Governance on Corporate Innovation Strategies. *The Academy of Management Journal* **45**(4): 697–716.
- Hsu, H., Reed, A.V. & Rocholl, J. (2010). The new game in town: competitive effects of IPOs. *The Journal of Finance* **65**(2): 495–528.
- Jensen, M.C. (1994). Self-interest, altruism, incentives, and agency. *Journal of Applied Corporate Finance* **7**(2): 40–45.
- Jensen, M.C. & Meckling, W.H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics* **3**: 305–360.
- Kellermanns, F.W. & Eddleston, K. (2007). Family perspective on when conflict benefits family firm performance. *Journal of Business Research: Special Issue on Family Firms* **60**: 1048–1057.
- Kennedy, P. (2006). *A Guide to Econometrics*. Cambridge (MA): MIT Press.
- Kotlar, J., Signori, A., De Massis, A. & Vismara, S. (2017). Financial Wealth, Socioemotional Wealth and IPO Underpricing in Family Firms: A Two-Stage Gamble Model. *The Academy of Management Journal* **61**(3): 1073–1099.
- Kroll, M., Walters, B.A. & Le, S.A. (2007). The impact of board composition and top management team ownership structure on post-IPO performance in young entrepreneurial firms. *The Academy of Management Journal* **50**: 1198–1216.
- La Porta, R., Lopez-de-Silanes, F. & Shleifer, A. (1999). Corporate ownership around the world. *The Journal of Finance* **54**: 471–517.

- Le Breton-Miller, I. & Miller, D. (2009). Agency vs. stewardship in public family firms: A social embeddedness reconciliation. *Entrepreneurship Theory Practice* **33**(6): 1169–1191.
- Le Breton-Miller, I., Miller, D. & Lester, R.H. (2011). Stewardship or Agency? A Social Embeddedness Reconciliation of Conduct and Performance in Public Family Businesses. *Organization Science* **22**(3): 704–721.
- Lee, P.M. & O'Neill, H.M. (2003). Ownership structures and R&D investments of U.S. and Japanese firms: Agency and stewardship perspectives. *The Academy of Management Journal* **46**(2): 212–225.
- Leitterstorf, M.P. & Rau, S.B. (2014). Socioemotional wealth and IPO underpricing of family firms. *Strategic Management Journal* **35**(5): 751–760.
- Leitterstorf, M.P. & Wachter, M. (2016). Takeover Premiums and Family Blockholders. *Family Business Review* **29**(2): 214–230.
- Levitas, E. & Chi, T. (2010). A look at the value creation effects of patenting and capital investment through a real options lens: the moderating role of uncertainty. *Strategic Entrepreneurship Journal* **4**(3): 212–233.
- Liu, K., Arthurs, J.D., Nam, D. & Mousa, F.T. (2014). Information diffusion and value redistribution among transaction partners of the IPO firm. *Strategic Management Journal* **35**(11): 1717–1726.
- Loughran, T. & Ritter, J.R. (2004). Why Has IPO Underpricing Increased Over Time? *Financial Management* **33**: 5–37.
- Lungeanu, R. & Zajac, E.J. (2016). Venture capital ownership as a contingent resource: How owner-firm fit influences IPO outcomes. *The Academy of Management Journal* **59**(3): 930–955.
- Madison, K., Holt, D.T., Kellermanns, F.W. & Ranft, A.L. (2016). Viewing family firm behavior and governance through the lens of agency and stewardship theories. *Family Business Review* **29**(1): 65–93.
- Maury, B. (2006). Family ownership and firm performance: Empirical evidence from Western European corporations. *Journal of Corporate Finance* **12**(2): 321–341.
- Mayer, R.C. & Schoorman, D.F. (1998). Differentiating antecedents of organizational commitment: A test of March and Simon's model. *Journal of Organizational Behavior* **19**: 15–28.
- Miller, D. & Le Breton-Miller, I. (2005). *Managing for the long run: Lessons in competitive advantage from great family businesses*. Boston (MA): Harvard Business School Press.
- Miller, D. & Le Breton-Miller, I. (2006). Family governance and firm performance: Agency, stewardship, and capabilities. *Family Business Review* **19**(1): 73–87.
- Miller, D., Le Breton-Miller, I., Lester, R. & Cannella, A. (2007). Do family businesses outperform? A study of the Fortune 1000. *Journal of Corporate Finance* **13**: 829–858.
- Miller, D., Le Breton-Miller, I. & Scholnick, B. (2008). Stewardship vs. stagnation: An empirical comparison of small family and non-family businesses. *Journal of Management Studies* **45**(1): 51–78.

- Miller, D., Minichilli, A. & Corbetta, G. (2013). Is family leadership always beneficial? *Strategic Management Journal* **34**: 553–571.
- Miller, J.S., Wiseman, R.M. & Gómez-Mejía, L.R. (2002). The fit between CEO compensation design and firm risk. *Academy of Management Journal* **45**(4): 745–756.
- Morck, R. & Yeung, B. (2003). Agency problems in large family business groups. *Entrepreneurship Theory and Practice* **27**: 367–382.
- Neckebrouck, J., Schulze, W. & Zellweger, T.M. (2018). Are Family Firms Good Employers? *The Academy of Management Journal* **61**(2): 553–585.
- Nelson, T. (2003). The persistence of founder influence: Management, ownership, and performance effects at initial public offering. *Strategic Management Journal* **24**: 707–724.
- Ragozzino, R. & Reuer, J.J. (2011). Geographic distance and corporate acquisition: Signals from IPO firms. *Strategic Management Journal* **32**: 876–894.
- Reuer, J.J. & Tong, T.W. (2010). Discovering Valuable Growth Opportunities: An Analysis of Equity Alliances with IPO Firms. *Organization Science* **21**(1): 202–215.
- Rock, K. (1986). Why new issues are underpriced. *Journal of Financial Economics* **15**: 187–212.
- Stryker, S. (1980). *Symbolic interactionism: A social structural version*. Caldwell (ID): Blackburn Press.
- Tsui, A.S., Pearce, J.L., Porter, L.W. & Tripoli, A.M. (1997). Alternative approaches to the employee organization relationship: Does investment in employees pay off? *The Academy of Management Journal* **40**(5): 1089–1121.
- Villalonga, B. & Amit, R. (2006). How do family ownership, control, and management affect firm value? *Journal of Financial Economics* **80**: 385–417.
- Villalonga, B., Amit, R., Trujillo, M.A. & Guzman, A. (2015). Governance of Family Firms. *Annual Review of Financial Economics* **1**: 635–654.
- Wang, T. & Song, M. (2016). Are Founder Directors Detrimental to New Ventures at Initial Public Offering? *Journal of Management* **42**(3): 644–670.
- Welbourne, T.M. & Cyr, L.A. (1999). The human resource executive effect in initial public offering firms. *The Academy of Management Journal* **42**: 616–629.
- Young, M.N., Peng, M.W., Ahlstrom, D., Bruton, G.D. & Jiang, Y. (2008). Corporate governance in emerging economies: A review of the principal–principal perspective. *Journal of Management Studies* **45**(1): 196–220.
- Zahra, S.A., Hayton, J.C., Neubaum, D.O., Dibrell, C. & Craig, J. (2008). Culture of family commitment and strategic flexibility: The moderating effect of stewardship. *Entrepreneurship Theory and Practice* **32**(6): 1035–1054.
- Zellweger, T.M., Eddleston, K.A. & Kellermanns, F.W. (2010). Exploring the concept of familiness: Introducing family firm identity. *Journal of Family Business Strategy* **1**(1): 54–63.
- Zellweger, T.M. & Kammerlander, N. (2015). Family, wealth, and governance: An agency account. *Entrepreneurship Theory and Practice* **39**(6): 1281–1303.

- Zellweger, T.M., Kellermanns, F.W., Chrisman, J.J. & Chua, J.H. (2012). Family control and family firm valuation by family CEOs: the importance of intentions for transgenerational control. *Organization Science* **23(3)**: 851–868.
- Zellweger, T.M., Sieger, P. & Halter, F. (2011). Should I stay or should I go? Career choice intentions of students with family business background. *Journal of Business Venturing* **26(5)**: 521–536.

Figure 1: Financial stewardship and organizational context

Forms of organizational contexts		
	Stewardship <u>enabling</u>	Stewardship <u>hindering</u>
<i>A. Long-term orientation</i>	Firm strategy focusing on long-term investment horizons; high tolerance of risky and uncertain investment environment; emphasis on continuity, longevity and transgenerational control; commitment to R&D investment projects with long-term payback	Focus on short-term investment horizons; shortened financial reporting cycles; increased market pressure to maximize profits; limited investments in research and development; low risk tolerance and preference towards business investment certainty; heightened pressure to payout dividends to shareholders
<i>B. Empowerment & autonomy</i>	Emphasis on steward empowerment and autonomy; organizational structure to facilitate managerial flexibility, trusted relationships and investment autonomy; limited monitoring efforts over financial decisions	Strong monitoring and disciplining efforts of stewards by blockholders; restricted autonomy in financial decision-making for stewards; monitoring efforts of blockholders motivated by distrust and supervision towards firm stewards
<i>C. Firm identity</i>	High levels of steward-firm identity; high family-to-firm unity; strong overlap between family and firm identity; mutual exchange and understanding of firm values and motives; management based on trust and collective understanding of firm goals	Diverging conceptions of firm identity; changes in firm vision and shared values induced by external pressure; emotional distance between family and business; high levels of distrust between stewards and principals; low value and continuance commitment

Table 1: Summary statistics

Variable	All firms			Family firms		Nonfamily firms		Diff. in mean
	Mean (1)	Median	S.D.	Mean (2)	S.D.	Mean (3)	S.D.	[(3)-(2)]
Post-IPO financial stewardship	-0.108	-0.041	0.503	-0.152	-0.045	-0.092	0.501	0.060***
Post-IPO capital expenditure + R&D	-0.071	-0.025	0.191	-0.096	0.218	-0.063	0.178	0.033***
Post-IPO retained dividends	0.322	0.000	3.314	0.213	2.672	0.363	3.524	0.315
Post-IPO risk tolerance	-0.039	-0.011	3.149	-0.099	3.360	-0.016	3.067	0.083*
Family firm ^b	0.273	0.000	0.443	1.000	0.000	0.000	0.000	-1.000***
Firm size	6.648	6.546	1.633	6.355	1.530	6.756	1.657	0.401***
Firm leverage	0.179	0.035	0.249	0.110	0.192	0.205	0.263	0.094***
Capital intensity	0.594	0.107	1.645	0.434	0.049	0.653	0.040	0.219**
Firm age	23.591	13.000	25.411	16.459	0.593	26.203	0.633	9.744***
Dual class share ^b	0.114	0.000	0.318	0.117	0.012	0.113	0.007	-0.004
Family shares sold ^b	0.150	0.000	0.357	0.349	0.018	0.077	0.006	-0.271***
IPO size	162.285	95.400	183.485	127.414	5.832	175.059	4.381	47.645***
N	<u>2480</u>			<u>676</u>		<u>1804</u>		
<i>Family firm heterogeneity</i>								
Family mgmt. involvement				0.162	0.062			
Family ownership				0.255	0.211			
Pre-IPO family ownership				0.334	0.255			
Nonfamily blockholders				0.300	0.008			
Pre-IPO nonfamily blockholders				0.380	0.010			

Notes: ^b indicates a binary variable. The differences in mean are tested using a two-sample t-test. The symbols *, ** and *** indicate two-tail significance at the 5%, 1% and 0.1% levels, respectively. Categorical variables "IPO underwriter", "IPO share type " and "Hightech industry "are intentionally omitted. Variables are not log-transformed for the ease of interpretation.

Table 2: Financial stewardship index - component variables by year

Panel A: Financial stewardship index				Panel B: capital expenditure + R&D			
	Family	Nonfamily	Diff.		Family	Nonfamily	Diff.
Pre-IPO _{avg}	0.076	-0.013	**	Pre-IPO _{avg}	0.202	0.157	***
IPO _{year}	-0.112	-0.074	-	IPO _{year}	0.136	0.143	-
IPO _{year+1}	-0.050	-0.058	-	IPO _{year+1}	0.160	0.157	-
IPO _{year+2}	-0.040	-0.080	-	IPO _{year+2}	0.158	0.149	-
IPO _{year+3}	-0.010	-0.111	*	IPO _{year+3}	0.175	0.126	**
IPO _{year+4}	0.002	-0.121	**	IPO _{year+4}	0.176	0.120	**
IPO _{year+5}	-0.073	-0.117	-	IPO _{year+5}	0.147	0.119	-

Panel C: Retained dividends				Panel D: Risk tolerance			
	Family	Nonfamily	Diff.		Family	Nonfamily	Diff.
Pre-IPO _{avg}	0.684	0.656	*	Pre-IPO _{avg}	0.411	0.350	-
IPO _{year}	0.795	0.644	-	IPO _{year}	0.171	0.470	-
IPO _{year+1}	0.953	0.814	*	IPO _{year+1}	0.449	0.405	-
IPO _{year+2}	0.957	0.794	**	IPO _{year+2}	0.666	0.354	-
IPO _{year+3}	0.918	0.834	-	IPO _{year+3}	0.152	0.535	-
IPO _{year+4}	0.947	0.818	-	IPO _{year+4}	0.269	0.513	-
IPO _{year+5}	0.841	0.781	-	IPO _{year+5}	0.393	0.567	-

Notes: The symbols *, ** and *** indicate two-tail significance of t-tests to test the difference in mean between family firms and nonfamily firms for each year at the 5%, 1% and 0.1% levels, respectively. The symbol – indicates significance beyond the 5% level.

Table 3: Financial stewardship, nonfamily blockholders and family influence

	All firms		Family firms			
	Model I	Model II	Model III	Model IV	Model V	Model VI
Firm size	0.0518*** (0.0093)	0.0505*** (0.0096)	0.0973*** (0.0117)	0.0826*** (0.0117)	0.0940*** (0.0120)	0.0880*** (0.0257)
Firm leverage	0.0352 (0.0496)	0.0346 (0.0498)	0.3518*** (0.0854)	0.3504*** (0.0774)	0.3551*** (0.0703)	0.3442*** (0.0886)
Capital intensity	0.0265** (0.0077)	0.0255** (0.0078)	0.0634*** (0.0132)	0.0589*** (0.0137)	0.0664*** (0.0127)	0.0701* (0.0289)
Firm age	0.0017*** (0.0002)	0.0017*** (0.0002)	0.0001 (0.0008)	-0.0040*** (0.0010)	-0.0040*** (0.0009)	-0.0039** (0.0013)
Dual class share	0.0016 (0.0280)	-0.0005 (0.0282)	0.1088 (0.0762)	0.1779* (0.0791)	0.1665* (0.0677)	0.1858* (0.0732)
Family shares sold	0.0909*** (0.0178)	0.1106*** (0.0196)	0.1732*** (0.0430)	0.1886*** (0.0375)	0.1733*** (0.0339)	0.1563*** (0.0469)
IPO size	0.0128 (0.0086)	0.0143 (0.0088)	-0.1279*** (0.0280)	-0.1003*** (0.0249)	-0.1120*** (0.0259)	-0.0862* (0.0336)
IPO underwriter	-0.0001* (0.0001)	-0.0001 [†] (0.0001)	0.0000 (0.0001)	0.0000 (0.0001)	0.0000 (0.0001)	0.0000 (0.0001)
IPO share type	-0.0018 (0.0047)	-0.0022 (0.0047)	0.0068 (0.0127)	0.0420** (0.0129)	0.0483** (0.0180)	0.0414* (0.0198)
Hightech industry	-0.0008* (0.0004)	-0.0009* (0.0004)	0.0008 (0.0006)	0.0007 (0.0006)	0.0008 (0.0006)	0.0007 (0.0008)
Pre-IPO nonfamily blockholder s			0.0427 (0.0608)	1.1886*** (0.2901)	1.0961*** (0.2592)	1.1497*** (0.3364)
Family firm		-0.0549** (0.0206)				
Nonfamily blockholders (NBO)				-0.3540*** (0.0779)	-0.3739*** (0.0689)	-0.3869*** (0.0987)
Family mgmt. involvement					-0.0141 (0.0340)	
Family ownership						-0.0252 (0.0259)
NBO*Family mgmt. involvement					0.0665*** (0.0176)	
NBO*Family ownership						0.0645* (0.0280)
Year effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R ²	0.065	0.076	0.160	0.184	0.192	0.193
N	2480	2480	676	676	676	676

Notes: The symbols [†], *, ** and *** indicate two-tail significance at the 10%, 5%, 1% and 0.1% levels, respectively. The standard errors in parentheses refer to heteroskedasticity-consistent standard errors.

Table 4: Alternative measure of financial stewardship

	All firms		Family firms			
	Model I	Model II	Model III	Model IV	Model V	Model VI
Firm size	-0.0512*** (0.0139)	-0.0545*** (0.0139)	0.0024 (0.0215)	-0.0023 (0.0214)	0.0043 (0.0205)	-0.0107 (0.0232)
Firm leverage	-0.049 (0.0601)	-0.05 (0.0587)	-0.1551 (0.1825)	-0.1564 (0.1831)	-0.1528 (0.1883)	-0.1468 (0.1877)
Capital intensity	-0.0655*** (0.0174)	-0.0679*** (0.0171)	-0.0913* (0.0346)	-0.0921** (0.0344)	-0.0872* (0.0343)	-0.1055** (0.0356)
Firm age	0.0027*** (0.0003)	0.0026*** (0.0003)	0.0028* (0.0013)	0.0012 (0.0016)	0.0007 (0.0014)	0.0009 (0.0017)
Dual class share	-0.0232 (0.0248)	-0.028 (0.0260)	-0.0192 (0.0844)	0.0162 (0.0788)	0.0068 (0.0811)	0.0073 (0.0797)
Family shares sold	-0.0056 (0.0291)	0.042 (0.0296)	0.0711 (0.0754)	0.0756 (0.0741)	0.0661 (0.0715)	0.0774 (0.0837)
IPO size	0.0599*** (0.0155)	0.0562*** (0.0159)	0.0228 (0.0392)	0.0314 (0.0405)	0.0285 (0.0435)	0.0326 (0.0434)
IPO underwriter	0.0002** (0.0001)	0.0003*** (0.0001)	0.0006*** (0.0002)	0.0006*** (0.0002)	0.0006*** (0.0001)	0.0006*** (0.0002)
IPO share type	0.0065 (0.0081)	0.0056 (0.0083)	0.0264 (0.0244)	0.0403 (0.0241)	0.0506 [†] (0.0290)	0.0434 [†] (0.0239)
Hightech industry	-0.0004 (0.0005)	-0.0006 (0.0005)	0.0024*** (0.0006)	0.0023*** (0.0006)	0.0024*** (0.0006)	0.0025*** (0.0006)
Pre-IPO nonfamily blockholder			-0.3545** (0.1060)	0.1374 (0.3139)	0.2092 (0.3029)	0.2873 (0.3373)
Family firm		-0.1323*** (0.0209)				
Nonfamily blockholders (NBO)				-0.1365* (0.0969)	-0.1996 [†] (0.1059)	-0.154 (0.1160)
Family mgmt. involvement					-0.0078 (0.0489)	
Family ownership						0.0367 (0.0247)
NBO*Family mgmt. involvement					0.0546* (0.0248)	
NBO*Family ownership						0.0129 (0.0299)
Year effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R ²	0.089	0.094	0.206	0.207	0.208	0.207
N	2469	2469	676	676	676	676

Notes: The symbols [†], *, ** and *** indicate two-tail significance at the 10%, 5%, 1% and 0.1% levels, respectively. The standard errors in parentheses refer to heteroskedasticity-consistent standard errors.

Table 5: Financial stewardship index components for Hypothesis 1

	Capital exp. + R&D	Retained dividends	Risk tolerance
	(1)	(2)	(3)
Firm size	0.0194*** (0.0037)	0.1104** (0.0381)	0.0492 (0.0632)
Firm leverage	0.0379 ^t (0.0218)	0.2325 (0.3402)	-0.6029* (0.2764)
Capital intensity	0.0108** (0.0034)	0.0412 (0.0496)	0.1016 (0.0692)
Firm age	0.0008*** (0.0001)	0.0068* (0.0028)	-0.0027 (0.0023)
Dual class share	0.0043 (0.0086)	-0.6281* (0.2523)	0.6447*** (0.1706)
Fam. shares sold	0.0168+ (0.0085)	1.0109*** (0.1415)	0.5075** (0.1728)
IPO size	0.0003 (0.0043)	0.0381 (0.0622)	-0.3209* (0.1228)
IPO underwriter	0.0000 0.0000	-0.0011** (0.0004)	0.0004 (0.0005)
IPO share type	-0.0009 (0.0018)	0.0365 (0.0536)	0.0411 (0.0610)
Hightech industry	-0.0001 (0.0001)	-0.0086*** (0.0019)	0.0071*** (0.0020)
Family firm	-0.0162 ^t (0.0097)	-0.3235** (0.1108)	-0.3292 ^t (0.1658)
Year effects	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes
Adj. R ²	0.125	0.069	0.032
N	2480	2480	2480

Notes: The symbols ^t, *, ** and *** indicate two-tail significance at the 10%, 5%, 1% and 0.1% levels, respectively. The standard errors in parentheses refer to heteroskedasticity-consistent standard errors.

Table 6: Financial stewardship index components for Hypotheses 2-4*Panel A: Nonfamily blockholders and family managerial involvement*

	Capital exp. + R&D	Retained dividends	Risk tolerance
	(1)	(2)	(3)
Nonfamily blockholders (NBO)	-0.0632*** (0.0162)	-0.1243 ^t (0.1144)	-0.3303 (0.3058)
Family mgmt. involvement	-0.0154 (0.0120)	-0.2779** (0.0885)	-0.0721 (0.2790)
NBO*Family mgmt. involvement	0.0377** (0.0115)	0.2505** (0.0927)	0.1229 (0.1024)
Controls	Yes	Yes	Yes
Year effects	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes
Adj. R ²	0.230	0.555	0.109
N	676	676	676

Notes: The symbols ^t, *, ** and *** indicate two-tail significance at the 10%, 5%, 1% and 0.1% levels, respectively. The standard errors in parentheses refer to heteroskedasticity-consistent standard errors.

Panel B: Nonfamily blockholders and family ownership

	Capital exp. + R&D	Retained dividends	Risk tolerance
	(1)	(2)	(3)
Nonfamily blockholders (NBO)	-0.0470*** (0.0092)	-0.1818* (0.0815)	-0.2994 (0.3238)
Family ownership	0.0464 (0.0321)	0.7441 (0.4464)	-0.6007 (0.7266)
NBO*Family ownership	0.0279** (0.0099)	0.3487*** (0.0931)	0.1983 (0.1931)
Controls	Yes	Yes	Yes
Year effects	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes
Adj. R ²	0.224	0.559	0.111
N	676	676	676

Notes: The symbols ^t, *, ** and *** indicate two-tail significance at the 10%, 5%, 1% and 0.1% levels, respectively. The standard errors in parentheses refer to heteroskedasticity-consistent standard errors.

Table 7: Financial stewardship and family managerial influence

	Model I	Model II	Model III
Nonfamily blockholders (NBO)	-0.3694*** (0.0744)	-0.3932*** (0.0742)	-0.3687*** (0.087)
Family executive influence	-0.0061 (0.0318)		
Family board influence		-0.0300 (0.0286)	
Family CEO			0.0295 (0.1093)
NBO*Family executive influence	0.0373** (0.0121)		
NBO*Family board influence		0.0798* (0.0323)	
NBO ownership*Family CEO			0.0131 (0.0531)
Controls	Yes	Yes	Yes
Year effects	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes
Adj. R ²	0.186	0.190	0.183
N	676	676	676

Notes: The symbols †, *, ** and *** indicate two-tail significance at the 10%, 5%, 1% and 0.1% levels, respectively. The standard errors in parentheses refer to heteroskedasticity-consistent standard errors.

Appendix A: Correlation matrix

Variable	Pairwise Pearson correlations						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) Firm size	1.0000						
(2) Firm leverage	0.2101*	1.0000					
(3) Capital intensity	-0.1036*	0.2969*	1.0000				
(4) Firm age	0.3441*	0.2685*	0.1289*	1.0000			
(5) Dual class share ^b	0.0250	-0.0257	-0.0127	0.0825*	1.0000		
(6) Family shares sold ^b	0.0589*	-0.1192*	-0.0849*	-0.0949*	0.0017	1.0000	
(7) IPO size	0.5471*	0.2884*	0.2829*	0.2154*	0.0103	0.0648*	1.0000
(8) Pre-IPO nonfamily blockholder	-0.0947*	-0.1392*	-0.1204*	-0.2130*	-0.0840*	0.2516*	-0.0625*

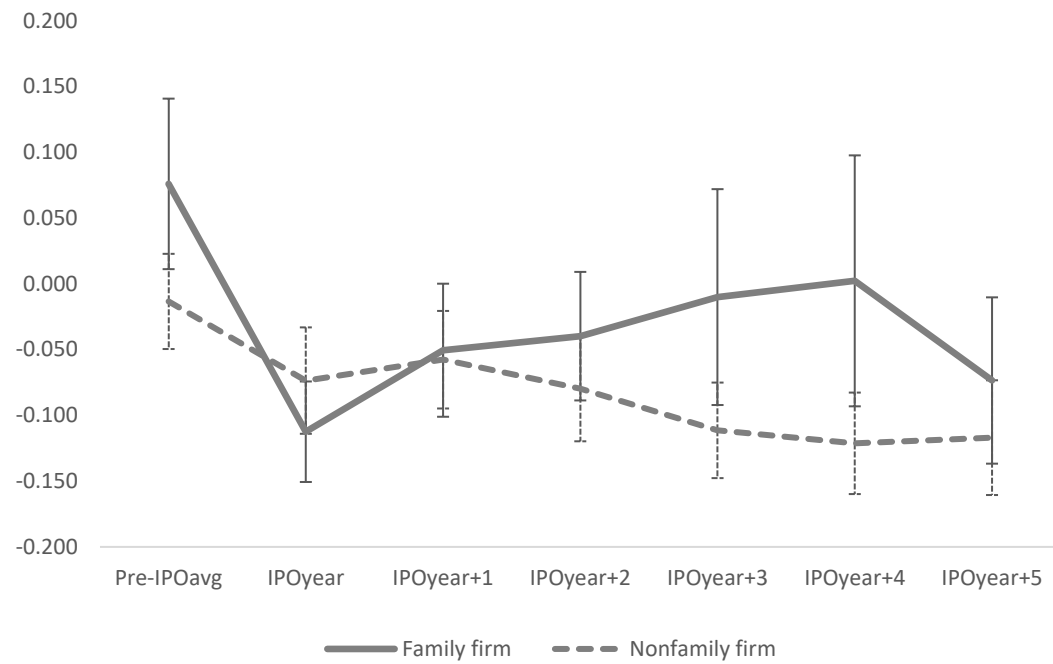
Notes: * $p < 0.05$; ^b indicates a binary variable. All continuous variables are winsorized at their 1st and 99th percentile of their distribution. Categorical variables "IPO underwriter" "IPO share type" and "Hightech industry" are intentionally omitted.

Appendix B: Definition of financial stewardship

Financial stewardship index

<i>Variable</i>		<i>Operationalization</i>
1)	Capital expenditures + R&D	Sum of annual capital expenditures and annual R&D expenses plus divided by total assets
2)	Retained dividends	1 minus [annual dividends divided by annual earnings]
3)	Risk tolerance	Coefficient of variation of a firm's earnings before interest, taxes, depreciations, and amortizations
<i>Index based on Neckebrouck et al. (2018)</i>		

Appendix C: Financial stewardship by year



Notes: Error bars indicate the range for 95% confidence interval of financial stewardship index

Appendix D: Definition of an alternative financial stewardship index

Financial stewardship index 2 (alternative definition)

	<i>Variable</i>	<i>Operationalization</i>
1)	R&D expenses	Annual R&D expenses divided by total sales
2)	Capital expenditure	Annual capital expenditures divided by property, plant and equipment
3)	Cash holdings	Cash plus short-term investments divided by the total property, plant and equipment
4)	Retained dividends	1 minus [annual dividends divided by annual earnings]
5)	Risk tolerance	Coefficient of variation of a firm's earnings before interest, taxes, depreciations, and amortizations
<i>Index based on Le Breton-Miller et al. (2011)</i>		

Appendix E: Financial stewardship index 2 - component variables by year

Panel A: Financial stewardship index 2				Panel B: Capital expenditures			
	Family	Nonfamily	Diff.		Family	Nonfamily	Diff.
Pre-IPO _{avg}	0.158	-0.188	***	Pre-IPO _{avg}	0.046	0.031	***
IPO _{year}	0.336	0.121	**	IPO _{year}	0.042	0.051	**
IPO _{year+1}	0.284	0.121	***	IPO _{year+1}	0.049	0.038	***
IPO _{year+2}	0.172	-0.137	***	IPO _{year+2}	0.043	0.033	***
IPO _{year+3}	0.049	-0.210	**	IPO _{year+3}	0.039	0.029	***
IPO _{year+4}	-0.091	-0.258	*	IPO _{year+4}	0.033	0.028	*
IPO _{year+5}	-0.141	-0.246	-	IPO _{year+5}	0.031	0.027	-
Panel C: R&D expenses				Panel D: Cash holdings			
	Family	Nonfamily	Diff.		Family	Nonfamily	Diff.
Pre-IPO _{avg}	0.075	0.119	-	Pre-IPO _{avg}	4.576	3.243	*
IPO _{year}	0.127	0.127	-	IPO _{year}	14.735	10.264	*
IPO _{year+1}	0.128	0.108	-	IPO _{year+1}	11.522	8.407	-
IPO _{year+2}	0.100	0.135	-	IPO _{year+2}	10.240	7.193	-
IPO _{year+3}	0.113	0.116	-	IPO _{year+3}	6.740	8.848	-
IPO _{year+4}	0.156	0.058	-	IPO _{year+4}	5.444	8.231	-
IPO _{year+5}	0.131	0.084	-	IPO _{year+5}	8.254	8.442	-
Panel E: Retained dividends				Panel F: Risk tolerance			
	Family	Nonfamily	Diff.		Family	Nonfamily	Diff.
Pre-IPO _{avg}	0.684	0.656	*	Pre-IPO _{avg}	0.411	0.350	**
IPO _{year}	0.795	0.644	-	IPO _{year}	0.171	0.470	-
IPO _{year+1}	0.953	0.814	*	IPO _{year+1}	0.449	0.405	-
IPO _{year+2}	0.957	0.794	**	IPO _{year+2}	0.666	0.354	-
IPO _{year+3}	0.918	0.834	-	IPO _{year+3}	0.152	0.535	-
IPO _{year+4}	0.947	0.818	-	IPO _{year+4}	0.269	0.513	-
IPO _{year+5}	0.841	0.781	-	IPO _{year+5}	0.393	0.567	-

Notes: The symbols *, ** and *** indicate two-tail significance t-tests to test the difference in mean for each year at the 5%, 1% and 0.1% levels, respectively. The symbol – indicates significance beyond the 5% level.

Appendix F: Description of variables

Variable	Description
1 Post-IPO financial stewardship	Difference between the mean of the firm's pre-IPO financial stewardship and the firm's financial stewardship for the five years after going public. Financial stewardship is measured as a composite index of three standardized financial indicators (i.e., investments in R&D + capital expenditures; retained dividends; risk tolerance)
2 Family firm	Dichotomous variable that equals 1 if the founding family controls at least 5% of the firm and has at least one member of the family involved in the management at the time of the IPO, 0 otherwise
3 Nonfamily blockholders	Continuous variable measured as the sum of retained nonfamily blockholder ownership after going public
4 Family management involvement	Continuous variable measured as the number of family members employed in the management divided by the size of firm management
5 Family ownership	Continuous variable measured as the sum of retained family ownership after going public
6 Firm size	Continuous variable measured as the natural logarithm of the total number of firm employees
7 Firm leverage	Continuous variable measured as the total debt outstanding divided by total firm assets
8 Capital intensity	Continuous variable measured as the natural logarithm of total fixed assets divided by the number of firm employees
9 Firm age	Continuous variable measured as the reporting year minus the founding year of the firm
10 Dual class share	Dichotomous variable that equals 1 if the firm has a dual class structure, 0 otherwise
11 Family shares sold	Dichotomous variable that equals 1 if the founding family sold shares as part of the public offering, 0 otherwise
12 IPO size	Continuous variable measured as the natural logarithm of the total capital raised as part of the IPO
13 Pre-IPO nonfamily blockholders	Continuous variable measured as the sum of nonfamily blockholder ownership prior to going public
14 IPO underwriter	Categorical variable defined as the lead underwriter responsible for the IPO
15 IPO share type	Categorical variable defined as the type of security issued as part of the IPO
16 Hightech industry	Categorical variable defined as the type of hightech industry of the firm's primary business dealings

[This page intentionally left blank]

Curriculum Vitae

Tobias Hans Schori, born September 25, 1989, in Zollikon (Switzerland)

Education

2020	Ph.D. Visiting Scholar Columbia Business School, Columbia University (USA)
2017-2021	Ph.D. Program in Management University of St. Gallen (Switzerland)
2013-2015	M.A. in Accounting and Finance (MAccFin) University of St. Gallen (Switzerland)
2013-2015	M.A. in International Management (CEMS) University of St. Gallen (Switzerland)
2009-2013	B.A. in Business Administration University of St. Gallen (Switzerland)

Professional experience

2017-2021	Senior Research Fellow / Research Associate St.Gallen Institute of Management in Asia (Singapore)
2015-2017	Consulting Financial Services PriceWaterhouseCoopers (Switzerland)
2011-2013	Business Development Private Banking Credit Suisse Group (Switzerland)
2005-2008	Eidg. Dipl. Bankkaufmann Credit Suisse Group (Switzerland)