

Family offices: how are they different?

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Master's dissertation submitted in order to obtain the degree of Master of Science in Business Engineering - Finance

Academic year 2024-2025

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Foreword

This study was conducted as part of a broader effort to understand emerging trends in private capital markets. In particular, the rise of family offices as significant direct investors poses new questions about ownership, governance, and long-term strategic behavior in privately held firms. This work also marks the culmination of my five-year academic journey in Business Engineering. A period that has been intellectually enriching, personally transformative and overall, nothing but amazing.

I am sincerely grateful to prof. dr. ir. Sophie Manigart and prof. dr. Jeroen Verbouw for their guidance and support throughout this research process. Their constructive feedback, deep expertise, and thoughtful mentorship have been instrumental in shaping the quality and direction of this dissertation. Thanks to their intellectual rigor and critical perspective this work has far exceeded my expectations.

Finally, I would like to thank my family and friends. Studying the governance and values behind family offices has not only been intellectually rewarding, but also personally meaningful. It has served as a reminder of the vital role that trust, continuity, and support play in any enduring endeavor. This reflection has deepened my appreciation for the people closest to me. I am grateful for their constant belief in me, their patience during demanding periods, and the joy they brought throughout this transformative chapter. Their support has been, in many ways, the foundation upon which this work was built.

Pieter Rosiers
Ghent, June 2025

Abstract

Over the past decades, family offices have transitioned from passive wealth stewards into influential direct investors. This evolution reflects a broader structural transformation in global wealth management, where ultra-high-net-worth families seek increased autonomy and long-term strategic engagement through private markets. In contrast to the well-documented influence of private equity (PE) and venture capital (VC) on firm outcomes, the empirical role of family offices remains underexplored. Existing research has largely focused on their selection criteria but lacks clarity on their post-investment behavior and impact. This study investigates whether firms backed by family offices differ in performance outcomes from those backed by PE or VC. Using two matched samples—one of 72 family-office-backed companies and 129 venture capital-backed companies, and another of 87 family-office-backed companies and 164 private equity-backed companies—we evaluate differences in growth and profitability. We find that family office-backed companies have highly significant lower growth compared to their venture capital-backed counterparts. Furthermore, we find that for return on assets, there is no significant difference between a FO-backed company compared to their VC-backed or PE-backed counterpart. To ensure the robustness of our findings, we conducted multiple robustness tests, including alternative matching specifications and difference-in-differences models incorporating firm fixed effects. These findings contribute to governance theory debates and on whether family offices differ in their post-investment influence from other private capital firms.

Keywords Family offices, Private equity, Venture capital, Post-Investment Performance, Asset Growth, Return on Assets, Patient Capital, Stewardship Theory, Agency Theory, Corporate Governance, Investment Behavior, Direct Investing, Private Capital Markets

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List of Abbreviations

FO	Family office
SFO	Single-Family office
MFO	Multi-Family office
PE	Private equity
VC	Venture capital
ROA	Return on Assets
ROE	Return on Equity
PSM	Propensity Score Matching
DiD	Difference-in-Differences
OLS	Ordinary Least Squares
AUM	Assets Under Management
RMSE	Root Mean Squared Error
LBO	Leveraged Buyout
IPO	Initial Public Offering
ISO	International Organization for Standardization
BvD	Bureau van Dijk
LP	Limited partner
FFE	Firm Fixed Effects
IRR	Internal Rate of Return
EBITDA	Earnings Before Interest, Taxes, Depreciation, and Amortization

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1 Introduction

Over the past two decades, family offices have rapidly expanded in number, size, and influence, evolving from passive wealth stewards into active direct investors. This shift reflects broader structural changes in global wealth management, where ultra-high-net-worth families increasingly seek autonomy, control, and long-term strategic engagement through private markets.

While private equity and venture capital have been extensively studied in relation to their impact on firm outcomes (Kaplan and Strömberg, 2009; Cumming, Siegel and Wright, 2007), there is far less empirical research on family offices', despite their growing role as providers of direct private capital (Schickinger et al., 2023). Family offices' inherent privacy, lack of regulatory reporting obligations, and heterogeneity in structures make them difficult to analyze systematically (Amit & Liechtenstein, 2009). Existing research has begun to differentiate family offices from PE and VC firms in terms of investment objectives and selection criteria (Block et al., 2019), but little is known about how they influence portfolio company performance after the investment has been made. Do family offices guide portfolio companies like traditional financial investors, or do they pursue a different strategic logic grounded in stewardship, legacy, and long-term value?

In this study, we examine whether firms backed by family offices perform differently from those backed by private equity or venture capital in terms of growth and profitability. To do so, we analyze two matched samples: the first includes 72 family-office-backed and 129 venture capital-backed firms, and the second includes 87 family-office-backed and 164 private equity-backed firms. By implementing a difference-in-difference analysis, we capture all insights on their guidance. Understanding how different investors influence firm outcomes post-investment contributes to broader debates in governance theory, especially around principal-agent alignment, monitoring intensity, and time horizon effects. Furthermore, as the investment landscape diversifies, mapping the behavior of emerging players like family offices is essential for understanding capital market efficiency and the strategic evolution of privately held firms.

2 Literature review

In this literature review we examine how different types of investors – family offices (FOs), private equity (PE) firms, and venture capital (VC) firms – operate, highlighting how their distinct characteristics may lead to varying outcomes. In recent years, the once-clear distinctions between these investor types have begun to blur as family offices increasingly step into direct investing roles alongside traditional PE/VC players. Despite this convergence, there remains limited understanding of how family offices' involvement after investment differs, particularly in terms of value creation within portfolio companies, indicating the need to examine these differences and illuminate their real impact on firms. This review seeks to frame that gap by comparing existing findings on the post-investment mechanisms and impacts associated with each investor type. The review covers empirical evidence of financial performance (e.g. revenue growth, profitability improvements, exit success) and strategic or organizational impacts (innovation, expansion, governance changes) following investments by FOs, PE, and VC.

2.1 Concepts and positioning

2.1.1 Concepts

Family offices are organizations dedicated to the management and preservation of entrepreneurial families' private wealth. They serve ultra-high-net-worth individuals or families, and provide tailored personal and wealth management services for individual family members (Daniell & Hamilton, 2010; Gilding, 2003; Gray, 2005; Grubman & Jaffe, 2010). Unlike family businesses, which are operating companies owned and managed by the family, family offices are purpose-built organizations focused solely on managing and growing family wealth—not running operational enterprises, though they may own stakes in them. Family offices go beyond traditional private banks by offering services like budgeting, philanthropic advising, and family governance, in addition to investment management (Rivo-López et al., 2017). These structural differences reflect families' diverse preferences for control and governance. As Zellweger and Kammerlander (2015) explain,

family offices can be seen as governance mechanisms designed to reduce family blockholder conflicts¹ and agency costs² that arise when wealth is distributed across multiple generations. Importantly, a family office often educates younger generations about wealth management to ensure longevity of the family’s fortune. Wessel et al. (2014) further highlight that modern family offices are not monolithic but vary significantly in their purpose, investment style, and professionalization level, ranging from legacy-driven wealth stewards to entrepreneurial investors behaving like mini private equity firms. Furthermore, qualitative research by Welsh et al. (2013) highlights how the role of family offices evolves over time, with first-generation founders often using the FO to pursue new entrepreneurial ventures, while successor generations increasingly focus on safeguarding family wealth and continuity—a reflection of the family office’s adaptability and enduring purpose.

The presence of family offices is increasing throughout the world. There are an estimated 8,030 single family offices in the world today, up from roughly 6,130 in 2019. This number is projected to grow to more than 10,720 by 2030, a 75% increase. Similarly, family offices’ total assets under management (AUM³) are expected to rise 73% from US\$3.1 trillion today to US\$5.4 trillion by 2030 (Deloitte Private, 2024). In particular, 75% of the family offices that exist, were established after 1990, underscoring how relatively young this sector is as a formalized industry. This growth reflects a trend in the wealth management landscape, where wealthy families seek more control over their investments. Contrary to the conservative stewardship that wealthy families used to have over their fortune, they choose more for direct investments in private equity deals, venture investments and real estate projects. Furthermore, during recent years they have profiled themselves more and more as active investors (Citi Private Bank, 2020).

To properly understand the role and nature of family offices as investors, it is important to contrast them with more traditional institutional investors, such as private equity (PE) and venture capital (VC) firms. According to the European private equity and venture capital association (Invest Europe), private equity is a form of equity investment into private companies, with a focus on long-term value creation and eventual realization of returns through exit events such as an initial public offering (IPO)⁴ or trade sales. These investments are generally managed by specialized PE firms that raise capital from external sources, more commonly institutional investors and high-net-worth individuals who act as limited partners (LPs)⁵. With this capital, PE firms typically acquire controlling or significant minority stakes in portfolio companies, often using high levels of debt in a so-called leveraged buyout (LBOs)⁶. Their goal is to actively improve company performance through strategic, operational, or financial restructuring, with an exit planned within a defined investment period, usually 5 to 7 years within a 10-year fund life cycle.

Venture capital, while considered a subset of private equity, focuses on an entirely different segment of the investment lifecycle: early-stage and high-potential startup companies. VC firms provide capital in startups that are typically pre-revenue or just beginning to generate sales. These investments carry high levels of risk due to uncertainty around product-market fit and scalability, but also offer the potential for outsized returns if the startup succeeds. VC firms often become actively involved in guiding their portfolio companies, taking board seats and offering strategic advice, particularly in areas such as growth strategy, fundraising, and team building. The goal is to shepherd these companies through their growth stages toward a successful exit, typically an IPO or acquisition by a larger company.

Family offices differ themselves from both private equity and venture capital in both structural and strategic dimensions. Firstly, they stand out for their autonomy and patience. A key difference is the source and

¹Blockholder conflicts refer to disagreements or tensions that arise when a dominant shareholder holds a controlling stake in a company, potentially pursuing interests that diverge from those of minority shareholders or the company itself.

²Agency issues describe problems that occur when an agent (such as a manager) acts on behalf of a principal (such as an owner or shareholder), but their incentives are misaligned.

³Assets under management (AUM) refers to the total market value of the financial assets that an investment firm, financial institution, or individual manages on behalf of clients.

⁴An IPO is the first time a private company offers its shares to the public by listing on a stock exchange.

⁵A limited partner is an investor in a private equity or venture capital fund who provides capital but does not manage the investments.

⁶An LBO is the acquisition of a company using a significant amount of borrowed money, often secured by the assets of the company being acquired.

nature of the capital invested. Family offices invest their own capital, family wealth accumulated and preserved across generations. As a result, they operate free from the constraints imposed by outside investors or limited partners. This autonomy enables family offices to pursue patient capital strategies, often maintaining investments over much longer periods than the typical 5- to 10-year window required by PE and VC funds. If a company is generating stable cash flows, the family office may even choose to retain ownership indefinitely, resulting in an everlasting holding period. This flexibility allows family offices to act as true long-term partners to the companies they invest in, aligning closely with founders who value stability and sustained support.

Secondly, the primary objectives of family offices, private equity, and venture capital firms diverge significantly due to their distinct strategies. Family offices typically prioritize wealth preservation, intergenerational continuity, and alignment with family values. Their investment strategies often include personal or philanthropic goals, and they may accept lower or more stable returns in exchange for long-term stability and control. Private equity firms, by contrast, focus on maximizing financial returns within a defined fund lifespan. They pursue value creation through operational improvements, cost efficiencies, and strategic repositioning of portfolio companies to prepare for profitable exits. Meanwhile, venture capital firms are driven by a growth-oriented mindset, seeking to back innovative startups with high potential for market disruption (Gompers and Lerner, 2001). Their objective is to identify early-stage ventures capable of delivering exponential returns, often within industries characterized by rapid technological evolution.

Thirdly, these varying investment objectives naturally lead to different levels of risk tolerance. Family offices are typically more conservative and risk-averse and therefore reluctant to make high-risk investments (Block et al. 2019; Wessel et al. 2014). Private equity firms operate with a moderate-to-high risk profile, particularly due to their use of leverage⁷ and active intervention in company operations, which can amplify both potential returns and downside risk. In contrast, venture capital firms embrace a high risk tolerance, recognizing that a significant portion of their investments may fail. Their strategy relies on the success of a few standout companies to generate fund-level returns, making risk-taking not only acceptable but essential to their model. These differences in risk appetite shape not only the types of investments made but also the management intensity and expectations around exit outcomes.

2.1.2 Conceptual positioning

Whether family offices constitute a unique investor category or just an extension of private equity has become an important debate in academic circles. On the one hand, many scholars emphasize the distinctiveness of FOs. They argue that family offices, being imbued with family influence, long-term stewardship goals, and idiosyncratic decision logics, are fundamentally different from institutional PE/VC firms. For instance, Rivo-López et al. (2016) propose that FOs should be studied as a stand-alone topic, separate from traditional family business or finance research. FOs do not manage pooled third-party capital, which frees them from the constraints of fundraising cycles and external LP oversight. This autonomy, combined with the family’s multi generational investment horizon, means FOs often pursue strategies that traditional PE funds “cannot” – for example, holding investments indefinitely. Some observers even dub family offices the “new private equity” in the sense that they now compete for similar deals but with a very different pitch: the ability to be ultra-patient, indefinite owners rather than exit-driven financiers (Kammerlander & Schickinger, 2019). Academically, this perspective aligns FOs with concepts like stewardship theory and socioemotional wealth preservation, portraying them as steward investors who extend the ethos of family business into the investment realm (caring for firms as stewards rather than just agents). Welsh et al. (2013) explicitly adopt a stewardship perspective, finding that many FO leaders see their role as protecting the family legacy and continuity through generations. In short, this camp sees family offices as a *sui generis*⁸ form of investor – neither traditional PE/VC nor typical family business, but a hybrid that merits a distinct classification (and new theoretical frameworks) in the investment landscape. Despite their growing presence in private markets, FOs remain underexplored in academic research. Unlike PE and VC firms, which are extensively studied, FOs operate largely behind the scenes, with limited empirical data available on their investment

⁷Leverage refers to the use of borrowed capital to finance an investment, aiming to amplify returns but also increasing financial risk.

⁸*Sui generis* is a Latin term meaning “of its own kind,” used to describe something unique or in a class by itself.

behavior and impact, leaving a significant gap in our understanding of how these unique investors shape market dynamics and firm outcomes.

On the other hand, a diverging view contends that family offices are essentially a variation of private equity, sharing more similarities than differences with other private investors. Proponents of this view point out that FOs increasingly hire former PE/VC professionals, pursue comparable deal sizes, and target similar asset classes, effectively blurring the lines between family money and institutional money. This raises a critical question: do family offices truly operate differently from private equity, or do they merely present the veneer of stewardship while replicating agency-driven strategies in practice? As family offices proliferate and professionalize, they have in many cases adopted the same best practices as PE funds – conducting rigorous due diligence⁹, syndicating co-investments, and demanding strong governance from portfolio firms. Thus, some scholars argue FOs may not represent a new species of investor, but rather “private equity with a twist”, where the twist is simply the source of capital (a single wealthy family) and a bit more flexibility on timing. In this view, the defining traits often ascribed to FOs – longer horizon, more qualitative goals – could be seen as differences of degree, not kind. Likewise, early assumptions in research often treated FOs as “financial optimizers” like PE – the expectation being that once operating through an investment office, families would behave just like profit-maximizing PE principals. They also collaborate heavily with traditional funds: co-investment is common, where an FO invests alongside a PE fund in a company, blurring the lines of who is the “sponsor.” Block et al. (2024) provide empirical evidence of this convergence. They found that companies owned by single-family offices exhibited capital structures similar to PE-backed firms, such as a higher reliance on long-term debt financing for growth. Empirical evidence is mixed, but this stance suggests that if one strips away the opacity, FOs’ end goal (wealth growth) is ultimately aligned with the private equity model, only without external investors. From an agency theory perspective, this alignment is partly structural: whereas traditional PE funds face classic principal-agent tensions between LPs and GPs¹⁰, family offices often reduce or eliminate these agency costs by unifying ownership and control within a single entity (Rivo-López et al., 2017). In other words, family offices might best be viewed as an under-researched subset of the private equity universe, rather than an entirely separate class of financial actor.

Notably, the conceptual positioning of family offices (FOs) is nuanced, as individual FOs often span a spectrum between stewardship and financial maximization (Wessel et al., 2014). Even within a single FO, there can be a push-and-pull dynamic between the family’s noneconomic objectives and the more financial approaches typical of professional investors. Recent research reflects this tension: Block et al. (2024) found evidence that FOs, while generally taking on higher long-term debt—suggesting a tilt toward financial optimization—also avoid excessive short-term leverage that might endanger stability. Interestingly, FOs managing their former operating companies tend to adopt more conservative, legacy-oriented structures than those investing in unrelated firms (Block et al., 2024). This indicates that FOs can toggle between a stewardship mode, prioritizing legacy and continuity, and a more PE-like approach driven by financial returns. These findings fuel the ongoing academic debate: Are FOs fundamentally stewards at heart, or do they oscillate between stewardship and agency logics depending on context? While some scholars describe FOs as a distinct type of owner with unique characteristics, others suggest they are simply practicing private equity under a different guise.

As these descriptions illustrate, family offices, private equity firms, and venture capital firms each possess distinct structural and strategic characteristics. Yet, recent trends indicate that these lines are increasingly blurred. Family offices, for instance, are no longer merely passive wealth managers; many now emulate the active investment approaches typical of private equity, including co-investments, rigorous governance practices, and a focus on financial optimization. Likewise, some FOs adopt venture-like risk profiles in pursuit of innovative opportunities. The following section explores this debate and the nuanced positioning of family offices in the modern investment landscape, drawing on theoretical frameworks such as agency theory, stewardship theory, and socioemotional wealth (SEW) theory. These perspectives help unpack whether FOs are

⁹Due diligence is a comprehensive appraisal of a business undertaken by a prospective buyer, focusing on its financials, operations, legal standing, and market position to assess risks and opportunities prior to investment.

¹⁰A General Partner (GP) is the fund manager in a private equity or venture capital firm, responsible for investment decisions and fund operations.

primarily driven by long-term, family-centric stewardship goals, a blend of agency and stewardship depending on context, or increasingly adopting the financial rationality characteristic of institutional investors.

2.2 Theoretical framework

As the preceding discussion highlights, family offices (FOs) occupy a complex and often contradictory position in the investment landscape, blending elements of stewardship and financial maximization. This hybrid identity challenges conventional theories that have long been used to explain the behavior and impact of private equity (PE) and venture capital (VC) investors. Scholars are increasingly recognizing that FOs cannot be easily categorized within a single theoretical framework. Instead, recent research has sought to reinterpret and adapt classic management theories—such as agency theory, stewardship theory, and socioemotional wealth theory (SEW)—to account for the unique characteristics and motivations of FOs. Each of these frameworks offers valuable insights into how FOs might compare to, or diverge from, the behaviors of traditional PE/VC investors, yet they also reveal contradictions and nuances that underscore the need for a multi-theoretical perspective.

Agency theory has long shaped understanding of private equity (PE) and venture capital (VC) firms, which operate as external investors focused on mitigating principal-agent conflicts. In firms where ownership and management are separated, managers may prioritize personal goals over shareholder value. PE and VC firms counter this through mechanisms such as performance-based incentives, staged financing, board control, and strict oversight. As Jensen (1989) argues, leveraged buyouts use high debt and incentive alignment to discipline management and reduce inefficiencies. Family offices (FOs), however, often take a different approach to the investor-investee relationship. Rather than primarily viewing investees through the lens of control and performance-based incentives, FOs frequently adopt a stewardship-oriented perspective. Stewardship theory posits that investors may act as stewards—driven by trust, shared values, and a long-term commitment to the investee’s success. Wessel et al. (2014) suggest that family offices may foster a “stewardship climate,” marked by relational trust, collaborative engagement, and non-financial objectives. FOs frequently exemplify this approach, investing with values-based intent, relational trust, and a focus on legacy and continuity. However, this is not uniform across all FOs. As some professionalize or transition leadership to later generations, they may adopt more control-oriented practices resembling PE firms.

2.2.1 Agency theory

From an agency theory perspective, family offices (FOs) do not fundamentally differ from private equity (PE) and venture capital (VC) investors in their relationships with target companies. In all three cases, the investor (principal) delegates operational control to the management team of the portfolio company (agent), creating potential for information asymmetry, moral hazard, and opportunistic behavior by managers (Jensen & Meckling, 1976). To address these risks, PE and VC investors have long relied on formal governance mechanisms, including staged financing, performance-based compensation, active board participation, covenants, and rigorous monitoring, all aimed at aligning management incentives with investor objectives (Kaplan & Strömberg, 2003; Gompers & Lerner, 2001; Jensen, 1989). The high leverage typical of leveraged buyouts further disciplines management by creating strong financial pressures to perform (Jensen, 1989).

2.2.2 Stewardship theory

FOs, however, while facing similar agency challenges, often adopt a different approach to managing their relationships with investee firms. This divergence brings us to stewardship theory, originally introduced by Davis, Schoorman, and Donaldson (1997) as a compelling alternative to agency theory. Stewardship theory posits that managers or owners are motivated by loyalty, intrinsic rewards, and collective goals, acting as stewards rather than opportunistic agents. In the context of FOs, this theory suggests that family offices cultivate relational trust, long-term commitment, and shared values with investee firms, fostering a “softer governance” approach that emphasizes cooperation over control (Wessel et al., 2014; Zellweger & Kammerlander, 2015). This approach works well when managers genuinely act as stewards, driven by mutual trust and shared objectives. However, it can expose the family to risks if managers fail to align with the FO’s interests, as FOs may exercise lighter monitoring and rely more on personal relationships and loyalty to

mitigate agency hazards.

Welsh et al. (2013) further refine the application of stewardship theory to FOs, highlighting generational differences in stewardship behavior. Founders (first generation) often view the FO as a vehicle for long-term growth and innovation, acting as dedicated stewards, while later generations may prioritize wealth preservation and family harmony. Steward behavior is typically strongest when the investment relates to the family's former operating business, where emotional ties are deepest. In contrast, investments in unrelated ventures may be managed more transactionally, resembling the agency-driven decision-making common in PE/VC settings.

Despite these complexities, stewardship theory remains a powerful framework for understanding why FOs often diverge from the high-risk, exit-focused strategies typical of PE and VC investors. Instead, FOs tend to emphasize patient capital, reinvestment, and stakeholder care, reflecting a desire not just to grow wealth, but to build and preserve a lasting legacy. Thus, while agency theory captures the fundamental investor-investee challenges common to both FOs and PE/VC firms, stewardship theory highlights the unique, values-driven approaches that distinguish family offices in practice.

2.2.3 Socioemotional wealth theory

Socioemotional Wealth (SEW) theory, developed by Gómez-Mejía et al. (2007, 2011), explains how family-controlled entities—such as family offices—prioritize non-financial goals like control, legacy, and reputation. Unlike private equity and venture capital firms that operate under agency logic and focus on maximizing returns, FOs often pursue strategies shaped by emotional attachment and intergenerational continuity. Rivo-López et al. (2020) explicitly apply socioemotional wealth theory to family offices. As Rivo-López et al. (2020, p. 3) state, "FOs are companies created by business families, whose primary purpose is to transfer wealth to the next generation; wealth understood in a broad sense, including not only its fortune but also its culture, values and so on" (citing Rivo-López & Villanueva-Villar, 2019). This perspective directly ties SEW to FOs' purpose, positioning them as organizations designed to serve both tangible and intangible family goals.

Moreover, Rivo-López et al. (2020) emphasize that whereas family businesses may aim primarily to maximize financial performance, FOs often prioritize family cohesion, harmony, and the transmission of legacy to future generations, even at the expense of financial optimization. They argue that this focus on socioemotional wealth explains why FOs tend to favor stability, long-term alignment, and relational trust with investee firms, diverging from the exit-driven, performance-optimized approaches typical of institutional investors like PE and VC firms. Specifically, the authors note that "the family can give priority to cohesion, family harmony and transmission of the family legacy to the next generation, against more financial objectives," and that this prioritization of intangible family values positions SEW as "the best theoretical alternative to analyze and understand the FO as an organization at the service of the business family" (Rivo-López et al., 2020, p. 3).

2.2.4 Conclusion

In summary, family offices, private equity and venture capital firms all face principal-agent challenges in their relationships with investee firms, as outlined by agency theory. However, the distinctiveness of FOs lies in their reliance on stewardship behaviors and socioemotional wealth motivations. Whereas PE and VC firms typically employ formal controls and financial incentives to align managerial interests with shareholder value, FOs often emphasize relational trust, long-term commitment, and family values, sometimes at the expense of strict financial oversight. This approach fosters governance structures that reflect both stewardship ideals—where managers act in alignment with family goals—and SEW priorities—where family legacy, cohesion, and reputation are foremost. This study aims to test these theoretical tensions—whether FOs truly embody stewardship in practice or increasingly resemble PE's agency-driven model, thereby advancing governance theory by challenging assumed categorical distinctions.

Yet, this divergence in governance and investment philosophy raises critical questions about investment

behavior outcomes. While FOs' emphasis on patience, stability, and stakeholder care may protect long-term value, it could also constrain growth and profitability compared to the high-performance-driven approaches of PE and VC investors. This divergence in governance approaches naturally extends into differences in investment behavior, as the philosophies and motivations of family offices, private equity, and venture capital investors shape how they deploy capital, select investments, and define success—which we will explore in the following section.

2.3 Investment behavior and objectives

2.3.1 Overview: contrasting investment philosophies and capital models

There exists substantial research comparing the investment selection criteria and objectives of family offices (FOs), private equity (PE), and venture capital (VC) firms. Block et al. (2019) provide a useful comparative analysis, highlighting how these investor types differ in their investment preferences, timelines, sourcing practices, and value creation approaches. While all aim for financial returns, their definitions of success and acceptable risk profiles vary significantly. PE investors typically focus on mature businesses with strong financials and a clear path to performance improvement. VCs, by contrast, look for early-stage firms with high growth potential, often in disruptive industries. FOs tend to prioritize lower-risk, cash-flow-stable companies and are more values-driven, reflecting the family's long-term legacy and wealth preservation goals. These differences are not merely stylistic; they stem from distinct philosophies about capital deployment, risk tolerance, control, and investor accountability. PE brings financial engineering and institutional rigor, VC emphasizes disruptive innovation and scalability, while FOs offer patient capital rooted in trust, family governance, and intergenerational goals. This comparative lens is important for entrepreneurs, fund managers, and policymakers aiming to align capital sources with company needs and strategic horizons. The following sections explore how each investor type sources deals, selects targets, and makes decisions, revealing key strategic distinctions.

2.3.2 Family office: balancing wealth preservation with active ownership

Family offices primarily aim to preserve wealth across generations while achieving steady, long-term growth. Their investment behavior reflects a dual mandate: growing capital responsibly while upholding the family's values and legacy. Compared to institutional investors, FOs are more risk-averse and favor firms with stable cash flows, low volatility, and predictable earnings (Block et al. 2019). They may avoid aggressive scaling or leverage strategies and instead focus on businesses aligned with long-term interests or industry familiarity (Schickinger et al., 2022). Many FOs limit their exposure to areas where they lack expertise, preferring sectors linked to the family's background. In terms of deal sourcing, FOs rely heavily on personal networks, other family offices, and trusted advisors. Studies show that a majority cite peer FOs as a top source of investment ideas, often sharing deals among their networks in so-called club deals (PwC, 2024). Co-investing with PE or VC funds is also common, particularly to leverage the due diligence of those institutional partners. However, FOs typically have small investment teams, limiting their bandwidth for sourcing and vetting numerous deals. Decision-making processes are highly flexible: some FOs operate with informal, relationship-driven approaches, while others mimic institutional models with investment committees and detailed analysis. Their autonomy from external LPs allows for quicker or more value-driven decisions. FOs increasingly present themselves as impact-driven investors, integrating ESG or philanthropic goals into their portfolios. However, questions remain about the depth and sincerity of these commitments, as formal reporting and verification mechanisms are often absent. This raises concerns about whether such initiatives represent genuine alignment with family values or are primarily reputational signaling strategies. However, despite this increasing presence, FOs remain significantly underrepresented in empirical research due to their preference for operating privately and minimal public disclosure. This opacity limits the availability of comparative performance data and hampers efforts to systematically assess their unique investment behaviors and impacts. Target companies vary widely depending on the family's mandate. Some FOs invest in early-stage ventures, while others prefer growth equity or buyouts. Geographically and sectorally, mandates may be broad or narrow, but they often reflect the family's expertise or ethical priorities. Overall, FOs pursue a nuanced mix of objectives: financial return, intergenerational continuity, control, and alignment with family identity.

2.3.3 Private equity: maximizing value through performance and control

Private equity firms operate with a singular objective: maximizing financial returns for their institutional investors, typically targeting IRRs¹¹ above 20%. Their investment horizon is short to medium term (4 to 7 years), and their model depends on acquiring companies that can be materially improved and profitably exited. They raise capital from limited partners such as pension funds, who expect high performance under tight timelines. This shapes a highly disciplined investment process. PE firms typically target mature, cash-generating companies that show room for operational, strategic, or financial enhancement (Kaul, Nary & Singh, 2018). Their deal sourcing is robust and structured, relying on a combination of investment banker relationships, proprietary outreach, and industry networks. Teams of analysts scout opportunities, while deal teams assess fit and value potential. Due diligence is rigorous, often involving external consultants, detailed financial modeling, market analyses, and legal structuring. Decision-making rests with investment committees, where partners must justify not only the target's attractiveness but also the path to value creation. PE deals often involve controlling stakes, allowing firms to make substantial changes post-acquisition. Common levers include cost-cutting, growth through add-ons, or leveraging debt for enhanced returns. Target industries vary, but firms often specialize to build sector expertise (e.g. healthcare, technology, consumer goods). Geographically, PE has expanded globally but remains concentrated in developed markets with strong legal protections and clear exit routes. Exit strategy is crucial: PE avoids deals lacking a foreseeable path to liquidity, whether through IPO, trade sale, or secondary buyout. In sum, PE's transactional model focuses on buying well, improving quickly, and exiting profitably—a model of intense involvement and financial optimization.

2.3.4 Venture capital: fueling innovation through high-risk, high-reward bets

Venture capital firms seek high returns by investing in early-stage companies with disruptive potential and rapid scalability. Unlike PE, which invests in mature firms, VCs back startups with uncertain financials but compelling ideas and strong founding teams (Hellmann & Puri, 2002). They accept high failure rates in exchange for the chance to fund the next market-defining success. Organized as closed-end funds with 8- to 10-year timelines, VC firms stage their investments, often beginning with small seed rounds and following up as milestones are hit. Deal sourcing relies heavily on networks, startup hubs, incubators, and referrals (Gompers et al. 2020). Top VCs are known for their visibility and reputation in sectors like technology, biotech, fintech, and clean energy. Warm introductions carry weight, and many firms prefer founders from known circles or past successes. Due diligence in VC is different from PE: it focuses less on financial history and more on team quality, product-market fit, and addressable market size. Investment decisions are made by committees, but often with room for individual partners to act on conviction. VCs commonly take board seats and assist with strategy, hiring, fundraising, and scaling. Cultural fit with founders is crucial, as VCs tend to be minority investors who rely on influence more than control. Stage-wise, early-stage investors focus on vision and innovation, while later-stage VCs look for scale-ups nearing IPO. Overall, VC investing is defined by high risk, long horizons, and a relentless search for transformative potential in nascent markets.

2.3.5 Conclusion: differentiated capital, differentiated strategies

While family offices, private equity firms, and venture capital funds all aim to generate returns, their underlying motives, constraints, and capabilities lead to distinct investment behaviors. Family offices balance financial objectives with legacy concerns, reputational goals, and long-term partnerships, often operating with great flexibility but limited bandwidth. PE firms bring institutional rigor and control-driven strategies to mature businesses, targeting short-term performance boosts and timely exits. Venture capital firms bet on long-shot startups with breakthrough potential, focusing on scale and disruption rather than current earnings. These different models influence every aspect of investment behavior—from deal sourcing to decision-making, industry preferences to governance style. Recognizing these differences is essential for entrepreneurs choosing capital partners and for scholars seeking to understand modern capital markets. The diversity of investor types also underscores why one-size-fits-all frameworks fall short; each capital provider brings a unique blend of incentives, constraints, and value-creation logic to the investment landscape.

¹¹Internal Rate of Return is a financial metric used to evaluate the profitability of an investment. In private equity, IRR is commonly used to compare the performance of different investments or funds over time.

These differing investment philosophies, capital models, and governance approaches suggest that family offices, private equity, and venture capital firms may exert distinct influences on the companies they back. However, while much is known about their investment preferences and strategic orientations, less is understood about the actual outcomes of these differing approaches in terms of firm growth and profitability. In the following section, we will provide an overview of existing research on these post-investment outcomes and frame the research gap that we are addressing.

2.4 Post-investment involvement and impact

Building on the theoretical foundations above, this section examines how family offices (FOs), private equity (PE), and venture capital (VC) firms differ in their post-investment involvement and outcomes. While the post-investment behaviors of PE and VC investors are well-documented, the influence of FOs remains underexplored. While FOs are often portrayed as stewardship-driven long-term investors, it remains unclear to what extent their behaviors truly diverge from PE and VC norms, particularly in governance and performance outcomes. This section highlights the empirical gaps in understanding FO-backed firms, and frames these as the research gaps this study aims to address.

PE firms are widely recognized for their hands-on governance and value creation strategies. Empirical research has consistently demonstrated that PE investors actively engage with their portfolio companies by overhauling governance structures, implementing performance-based incentives, and driving operational improvements (Kaplan, 1989; Guo, Hotchkiss & Song, 2011). Leveraged buyouts (LBOs) and financial engineering are common tactics used to impose discipline and unlock value (Axelson et al., 2013). Studies show that PE-backed firms experience significant growth, often through add-on acquisitions and expansion into new markets (Boucly, Sraer & Thesmar, 2011), and substantial profitability improvements, including higher EBITDA margins and returns on equity (Kaplan, 1989; Acharya et al., 2013).

VC firms, though often minority investors, exert substantial influence through board participation, staged financing, and strategic guidance (Gorman & Sahlman, 1989). VCs catalyze rapid growth and innovation, especially in early-stage startups, by providing not just capital but also critical network connections and strategic insights (Hellmann & Puri, 2002). Empirical studies show that VC-backed firms grow faster than their peers (Puri & Zarutskie, 2012), contribute disproportionately to IPO activity (Kaplan & Lerner, 2016), and drive substantial innovation (Kortum & Lerner, 2000). However, profitability is typically deprioritized in the early years, as VCs focus on scaling and market capture (Chemmanur et al., 2014).

In contrast to the robust evidence for PE and VC, empirical research on the post-investment outcomes of family offices remains scarce. While anecdotal reports and surveys (e.g., Wharton & WGFA, 2024) suggest that FOs can deliver solid portfolio-level returns, there is little rigorous, large-scale empirical analysis of firm-level impacts. Schickinger et al. (2022) highlight that FOs vary widely in their post-investment involvement, ranging from passive financiers to active governance participants, but the impact of these strategies on firm outcomes remains unclear. To date, the literature provides strong evidence that PE firms drive growth and profitability. They do this through aggressive operational and financial engineering strategies, producing measurable gains in revenue, margins, and efficiency (Kaplan, 1989; Axelson et al., 2013; Boucly et al., 2011). For VC firms we know that they accelerate growth, innovation, and professionalization in startups, with notable contributions to scaling, market impact, and IPO activity (Hellmann & Puri, 2002; Kortum & Lerner, 2000; Puri & Zarutskie, 2012). In contrast, while family offices are increasingly active investors, there is a glaring lack of empirical studies directly examining firm-level growth and profitability outcomes for FO-backed firms. Most available evidence is either anecdotal, based on survey data, or focused on co-investments rather than direct investment outcomes (Schickinger et al., 2022; Wharton & WGFA, 2024). The potential for FOs to create long-term value, foster innovation, or drive growth and profitability remains an open question, and this gap severely limits our understanding of how FOs compare to PE and VC in their real-world impact.

In summary, while the post-investment involvement, governance strategies, and outcomes of PE and VC

investors are well-documented, similar evidence for family offices is either absent or incomplete. This gap highlights a pressing need for systematic, empirical research to compare the post-investment performance of firms backed by family offices, private equity, and venture capital. Addressing this gap leads us to the following research questions:

- **RQ1:** How do firms backed or acquired by family offices differ in growth compared to firms backed by private equity or venture capital?
- **RQ2:** How do profitability and financial performance outcomes differ between FO-backed and PE- or VC-backed firms over time?

The next sections delve into the empirical foundations for these questions, and formulate testable hypotheses on growth and profitability differences based on distinct investment behaviors and value creation strategies.

2.4.1 Growth

Private equity (PE) firms actively drive portfolio company growth through a combination of strategic ownership and operational rigor. Typically acquiring controlling stakes, PE firms implement aggressive value creation strategies, including board overhauls, executive changes, and the installation of operating partners or consultants to catalyze efficiency and expansion. Kaplan (1989) documents significant CEO turnover post-buyout, reflecting the hands-on nature of PE governance. PE firms often embed operating partners or consultants to implement efficiency gains, restructure operations, and pursue growth through acquisitions, particularly in buy-and-build strategies. Their monitoring mechanisms are equally structured: frequent board meetings, granular monthly reporting, and performance-based compensation ensure adherence to financial and operational targets. More recent European evidence by Boucly et al. (2011) on 839 French buyouts reveals that PE funds helped firms grow faster and increase capital investment by relaxing credit constraints, particularly in private-to-private deals and financially constrained industries. Davis et al. (2014), found that PE effects on employment were mixed—modest job losses on average, but growth in privately held firms and cuts in public-to-private transactions. These findings challenge the stereotype of PE as mere cost-cutters, instead portraying them as strategic investors capable of driving meaningful company growth. However, the scale and nature of value creation remain highly context-dependent, shaped by factors like deal structure, firm size, market timing, and management alignment.

Venture capital (VC) firms, though typically minority investors, play a significant role in driving firm growth by leveraging their governance influence, strategic guidance, and network access. Rather than direct operational control, VCs act as mentors, focusing on advising startups on hiring, product strategy, and scaling, as noted by Gorman and Sahlman (1989). Monitoring tends to be milestone-driven, with staged financing acting as both a funding mechanism and a control tool. VCs prioritize growth metrics such as user acquisition or burn rate over profitability. Their value creation lies heavily in network effects—facilitating introductions to future investors, key hires, and partners. Hellmann and Puri (2002) show that VC involvement accelerates formalization and professionalization in startups. However, VCs rarely impose structural changes unless absolutely necessary, preserving founder autonomy. Empirical studies consistently link venture capital (VC) with accelerated firm growth, innovation, and managerial upgrades. Kaplan and Lerner (2016) noted that although VC funding is rare, VC-backed firms account for 20–30% of U.S. IPOs, illustrating their role in scaling high-growth firms. Puri and Zarutskie (2012) found that VC-backed startups grow faster in sales and employment, although they also face higher failure rates. On innovation, Kortum and Lerner (2000) estimated VC funding accounted for 8% of U.S. industrial innovations, despite representing only 3% of R&D spending. Chemmanur et al. (2014) found VC-backed patents more original and highly cited. Hellmann and Puri (2002) confirmed that VC support accelerates product development and professionalization. VCs drive startups to adopt HR policies, stock option plans (Bottazzi et al., 2008), and to replace founder-CEOs when scaling (Kaplan & Strömberg, 2009). Hsu (2004) showed that top-tier VC backing carries a signaling premium, with founders accepting lower valuations in exchange for credibility. Thus, VCs shape not just firm growth but also structure, strategy, and market perception.

Family offices (FOs) exhibit a highly heterogeneous approach to post-investment involvement, with practices ranging from passive co-investments with minimal oversight to active governance akin to private equity (PE) models. However, Schickinger et al. (2022) emphasize that FOs generally adopt a patient, conservative stance, prioritizing long-term stability and relational trust over aggressive performance targets typical of PE and venture capital (VC) firms. While professionalized FOs may implement robust reporting structures and oversight mechanisms, many prefer flexible, relationship-driven monitoring, with less emphasis on formalized control. In contrast, FO co-investments where external partners drive the deals tend to underperform, highlighting potential limitations in growth acceleration. Moreover, while anecdotal and survey-based reports (e.g., Wharton & WGFA, 2024) indicate that a substantial proportion of FOs achieve solid returns, the broader empirical literature remains sparse and less conclusive about systematic growth enhancement by FOs. This suggests that, compared to PE and VC, FOs may place relatively less emphasis on aggressive growth strategies, aligning more with their long-term, preservation-oriented objectives. Therefore, we propose the following two hypotheses to the first research question about growth:

H1a: Firms backed by family offices exhibit lower total asset growth in the post-investment period compared to firms backed by venture capital.

H1b: Firms backed by family offices exhibit lower total asset growth in the post-investment period compared to firms backed by private equity.

2.4.2 Profitability

Private equity firms typically engage in highly active ownership. In buyouts, they often acquire majority control, overhaul boards, and swiftly replace top executives to align leadership with value creation plans. As outlined earlier, PE firms impose active governance mechanisms to align management incentives with financial objectives (Kaplan, 1989). Guo, Hotchkiss and Song (2011) argue that PE investors provide strong equity incentives and impose tight financial control (debt pressure) on management. These efforts are underpinned by tight control mechanisms—budget variance tracking, debt covenants, and key performance indicators (KPIs)—that collectively enforce discipline and maximize returns within limited holding periods. Numerous studies confirm that PE ownership improves company profitability and efficiency. Foundational research by Kaplan (1989) and Smith (1990) showed that large leveraged buyouts (LBOs) in the 1980s led to significant increases in operating income and cash flow, even as capital expenditures declined. Acharya et al. (2013) showed that PE-backed firms with an internal operational focus achieved significant EBITDA margin gains. Axelson et al. (2013) found that LBO structures often enhance financial discipline and correlate with superior performance in bullish markets. Guo, Hotchkiss, and Song (2011) further documented post-buyout gains in cash flow and productivity.

Venture capitalists (VCs), while holding minority stakes, wield significant governance influence through board participation and protective provisions, yet they typically avoid direct operational control. Instead, they act as strategic guides, focusing on growth metrics such as user acquisition and burn rate over profitability. Gorman and Sahlman (1989) find that VCs devote significant time to advising on hiring, product strategy, and scaling. VCs continue their emphasis on milestone-based monitoring and strategic guidance but typically deprioritize profitability in favor of market expansion (Gorman & Sahlman, 1989; Chemmanur et al., 2014). Their value creation lies in catalyzing network effects, making key introductions and driving professionalization, as demonstrated by Hellmann and Puri (2002), who found that VCs accelerate the adoption of formal processes and professional management. Empirical studies consistently link venture capital (VC) with accelerated firm growth, innovation, and managerial upgrades. Empirical evidence consistently links VC involvement with rapid growth, innovation, and structural refinement. Kaplan and Lerner (2016) show that although rare, VC-backed firms account for a disproportionate share of IPOs, while Kortum and Lerner (2000) estimate that VC funding, though a small fraction of R&D spending, drives a significant portion of U.S. industrial innovations. VCs also encourage startups to implement HR policies, stock options, and in some cases, replace founder-CEOs to scale (Bottazzi et al., 2008; Kaplan & Strömberg, 2009). However, profitability is often sidelined, as VCs push for rapid growth and market capture, reflecting a strategic preference for scale over immediate financial returns.

Family offices (FOs) exhibit significant heterogeneity in their approaches to governance and profitability,

reflecting their unique structures and capacities. While some FOs are passive co-investors, receiving only quarterly updates and exerting minimal oversight, others adopt a more private equity (PE)-like approach, actively engaging with management and taking board seats. Schickinger et al. (2022) find that family offices exhibit more patient, conservative governance compared to PE. Professionally run FOs may demand robust reporting, similar to institutional investors. Governance involvement tends to be relationship-based rather than control-driven, with FOs favoring a collaborative tone that emphasizes trust, alignment, and long-term goals. Robust empirical evidence on the firm-level impact of family offices (FOs) is still limited, but emerging data offers insight. A 2024 Wharton & WGFA¹² survey showed that 45% of FOs achieved over 10% annualized net returns in the five years ending 2023, with no reported losses, suggesting resilience at the portfolio level. Successful FO involvement appears to hinge on internal expertise and the ability to engage deeply post-investment. While anecdotal reports note FO flexibility and alignment with long-term growth, the academic literature still lacks large-scale, firm-level outcome studies. This remains a key gap for future research. Therefore, we propose the following two hypotheses to the second research question about profitability:

H2a: Firms backed by family offices do not exhibit significantly different return on assets (ROA) in the first three years post-investment compared to VC-backed firms.

H2b: Firms backed by family offices exhibit lower return on assets (ROA) in the first three years post-investment compared to PE-backed firms.

2.5 Conclusion

Family office-backed firms may follow different post-transaction trajectories due to their unique ownership structure, lower agency costs, and stronger alignment with management (Zellweger & Kammerlander, 2015). Unlike PE and VC, whose post-investment strategies are often shaped by fund timelines and external investor expectations, family offices enjoy discretion over holding periods and investment pacing. This aligns with stewardship theory, which sees owners as long-term stewards of value, rather than agents optimizing short-term returns (Davis et al., 1997). One of the clearest differences remains exit strategy: PE and VC must eventually realize returns through liquidity events, whereas FOs can hold indefinitely, tailoring strategy toward sustainability rather than salability.

Despite their growing influence, academic knowledge of FOs remains remarkably underdeveloped. By contrast, VC and PE have been extensively studied in terms of value creation, governance, and innovation impact. FOs present not only a theoretical challenge—due to their hybrid nature and mission-driven ethos—but also a methodological one, given data scarcity and heterogeneity. Scholars increasingly call for more structured inquiry into FOs’ role in value creation, yet comparative, hypothesis-driven studies remain rare.

In conclusion, VC, PE, and FO investors each leave distinct post-investment imprints: VC fosters innovation and rapid scaling; PE restructures and disciplines; and FO offers patient capital with a values-aligned, long-term view. Yet, only the first two are well-understood in academic research. Importantly, no single theory—whether agency, stewardship, or socioemotional wealth—fully captures the complexities and nuances of family office behavior and impact. The hybrid nature of FOs likely necessitates a multi-theoretical framework that integrates elements from multiple perspectives, accounting for their unique blend of financial logic, family influence, and strategic discretion. This gap in understanding is not merely academic but also practical, as it limits our ability to evaluate, predict, or optimize FO impact in an increasingly diversified capital market.

Yet, despite the narrative positioning of FOs as patient, stewardship-oriented investors, the extent to which these claims translate into actual governance and performance outcomes remains contested. This study contributes to governance theory by interrogating whether FOs’ stewardship rhetoric aligns with their practices—or whether, in reality, they resemble PE firms more closely than often assumed.

¹²The Wharton Global Family Alliance (WGFA), established in 2004 as a partnership between the Wharton School and the CCC Alliance, conducts biennial surveys to provide insights into the practices and performance drivers of family offices worldwide.

3 Data

3.1 Data gathering

For our empirical analysis, we utilized secondary data from both Pitchbook and Orbis databases to compile a comprehensive dataset on equity transactions at the company level. Our data collection started by extracting all available completed private equity, venture capital and family office transactions from Orbis. To enrich this dataset and specifically identify transactions made by family offices, we completed our data collection with transactions identified by Pitchbook. Using the BvD Identifier, we linked company-level transaction data from Pitchbook back to Orbis, enabling us to retrieve consistent financial variables.

We focused on transactions executed between 2010 and 2020, while the financial data spanned from 2005 to 2024, ensuring that we captured firm performance both before and after the investment events. Furthermore, we kept both active and inactive companies in the sample to avoid survivorship bias. However, they often lacked data, which influenced their matchability later on in the methodology section. Our initial sample included 37,606 equity transactions, split between 2,039 family office transactions (1,679 from Pitchbook and 360 from Orbis) and 35,567 PE/VC transactions (from Orbis). To capture the impact of the first equity event, we retained only the earliest transaction per target company. This approach allowed us to more cleanly identify the initial impact of external equity ownership. We also eliminated overlap observations between the family office and PE/VC classifications.

Furthermore, we created additional variables necessary for analysis. For the leverage ratio, we used the total debt and total assets, obtained from Orbis, to calculate this. The same holds for the return on assets, where we divide net income by the total assets. For growth, we calculated the year-on-year total asset growth.

3.2 Data cleaning

Table 1: Sample construction and data cleaning by investor type

Cleaning Step	Family offices (FO)		PE/VC	
	Remaining	Lost	Remaining	Lost
Initial number of transactions	2,039	–	35,567	–
Remove overlapping firms (PE/VC firms also present in FO sample)	2,039	–	34,921	-646
Only retain first equity event per firm	1,950	-89	27,492	-7,429
Removal due to missing company age	1,739	-211	27,221	-271
Final observations before matching	1,739	–	27,221	–

Note: No observations were explicitly dropped due to missing covariates, but missingness influenced matchability.

To ensure a clean and consistent dataset suitable for empirical analysis, we applied a structured data cleaning procedure to both the family office (FO) and private equity/venture capital (PE/VC) samples. Table 1 outlines the main steps and corresponding changes in sample size for each investor type.

We began with a raw dataset comprising 2,039 family office-backed transactions, sourced from Pitchbook and Orbis, and 35,567 PE/VC-backed transactions from Orbis. In a first step, we eliminated 646 observations from the PE/VC group that also appeared in the FO dataset, thereby removing overlap and preventing double classification. The FO group was not affected by this step.

Next, we retained only the earliest equity investment per firm, thereby excluding later rounds of financing

or acquisitions. This step was critical for isolating the initial treatment event and avoiding contamination of post-treatment effects by subsequent ownership changes. While the FO sample experienced only a modest reduction of 89 transactions, the impact on the PE/VC sample was substantial: 7,429 observations were removed, representing over 20% of the original PE/VC dataset. This considerable reduction highlights the common practice of repeated financing rounds in venture capital and private equity, which, while economically relevant, would introduce analytical complexity. Furthermore, it could suggest that this is more common in private equity and venture capital, than it is in family offices. This observation not only reflects differences in financing practices but also highlights an area for further exploration, as the dynamics of follow-on investments may have important implications for firm performance.

Following these steps, the cleaned dataset comprised 1,739 FO-backed transactions and 27,221 PE/VC-backed transactions. To independently capture the different effects of both private equity and venture capital, we split these 27,221 transactions, based on the target company age. If a company was below 10 years of age, we marked them as venture capital transactions, otherwise they were marked as private equity transactions. This gave us 18468 companies backed by venture capital and 8753 companies backed by private equity. This arbitrary cutoff is supported by empirical evidence from both academic and practitioner sources. For example, Nepelski et al. (2016) found that 90% of all venture capital transactions were targets below 8 years of age. Furthermore, from this study we can conclude that about 93% of all venture capital transactions were below 10 years of age. No observations were explicitly dropped due to missing at this stage. However, the presence of missing values—especially in financial covariates—ultimately affected the matchability of firms. Table 1 summarizes the sample attrition at each stage of the cleaning process.

3.3 Definition of Variables

To empirically assess the impact of ownership structure on firm performance, we classify our variables into three categories: dependent variables, independent variables, and control variables. These are operationalized using firm-level data extracted from Orbis, spanning the period from 2005 to 2024. Total asset growth is calculated as the year-over-year percentage change in total assets and serves as a proxy for expansion and scaling capacity. Return on assets (ROA) is computed as net income over total assets, reflecting the efficiency of asset utilization. All variables are measured annually over a three-year post-investment window, with $t = 0$ marking the year of acquisition.

3.3.1 Dependent variables

We focus on two primary dependent variables that capture firm performance post-investment: asset growth and return on assets (ROA).

Asset Growth is defined as the year-over-year percentage change in total assets. This variable serves as a proxy for firm expansion. Return on Assets (ROA) is used as a measure of profitability, this ratio reflects how efficiently a firm uses its assets to generate earnings. ROA is calculated as net income divided by total assets.

3.3.2 Independent variables

Our key independent variables are three binary treatment indicators, called 'FODummy', 'PEDummy' and 'VCdummy'. They capture the type of investor involved in the acquisition. FODummy is a dummy variable equal to 1 if the firm is backed by a family office, and 0 if backed by either private equity (PE) or venture capital (VC). PEDummy is 1 if a non-family-office transaction is made by private equity and 0 if made by venture capital. Equally, VCDummy is 1 if a non-family-office backed transaction is done by venture capital and 0 if done by private equity. These dummy variables capture the core treatment effect of interest and underpin the subsequent analysis.

3.3.3 Control variables

To mitigate confounding and improve identification of the treatment effect, we include several control variables selected based on prior empirical literature (e.g., Kaplan & Strömberg, 2009; Block et al., 2019) and their theoretical relevance to performance outcomes. Firm leverage is measured as the ratio of total debt to total assets, while firm size is proxied by the natural logarithm of total assets in the year prior to treatment. We also control for firm age, defined as the number of years between the firm’s founding and the investment year. In addition, we incorporate fixed effects for country, using ISO 3166-1 alpha-2 codes, to capture institutional and macroeconomic heterogeneity. Sector-level variation is addressed using the Bureau van Dijk (BvD) industry classification, and temporal variation is controlled for by including year fixed effects based on the investment year. Although not all of these control variables are included directly in the outcome regression models, they are used in the propensity score matching (PSM) procedure to ensure balance between treated and control firms prior to estimation. This dual usage enhances the robustness of our empirical strategy.

Table 2: Description of variables used in the analyses

Variable	Description
FOdummy	Binary indicator equal to 1 if the firm is backed by a family office, and 0 if backed by private equity or venture capital.
PEdummy	Binary indicator equal to 1 if the firm is backed by private equity, and 0 otherwise. Used for control group identification.
VCdummy	Binary indicator equal to 1 if the firm is backed by venture capital, and 0 otherwise. Used for control group identification.
Year	Fiscal year of the deal observation.
Match_year	Year before which the investment event occurred.
Return_on_assets_tX	Return on assets at time $t + X$, defined as net income divided by total assets.
Growth_tX	Asset growth at time $t + X$, measured as the year-over-year change in total assets.
Leverage_tX	Leverage ratio at time $t + X$, calculated as total debt divided by total assets.
Total_assets_tX	Total assets at $t + X$; used in tables to enhance interpretability. Reported in thousands.
Log (total assets)_tX	Natural logarithm of total assets at $t + X$; used as a proxy for firm size.
Company age	Number of years the firm has been operational prior to the investment event.
Country_code	Country fixed effects, based on ISO 3166-1 alpha-2 codes.
Sector_bvd	Industry fixed effects, based on Bureau van Dijk sector classification.
Weights	Matching weights obtained from the propensity score matching procedure.

4 Methodology

4.1 Pre-matching descriptives

4.1.1 Descriptive comparison by treatment groups

Our dataset and matching strategy enable a detailed pre-matching comparison of family office-backed and venture capital-backed firms (for targets ≤ 10 years of age), and family office-backed versus private equity-backed firms (for targets > 10 years of age), across key firm characteristics. These comparisons are detailed in tables 3, 4, 5, and 6.

Before examining these characteristics, it's important to note that data completeness influenced the composition of the analysis samples. Firm-level observations with missing company age were excluded prior to this stage to ensure consistency. Additionally, covariates such as log assets, growth, ROA, and leverage contain varying levels of missingness. For example, as detailed table 29 in appendix, the FO vs VC comparison initially included 1,081 FO-backed and 18,468 VC-backed firms, but due to missing values in covariates, the final analysis in table 3 included only 219 FO-backed and 3,024 VC-backed firms with complete data.

Table 3 compares covariates for FO-backed and VC-backed firms (restricted to targets ≤ 10 years of age) at $t - 1$ (the year prior to investment). The analysis includes only observations with complete data, resulting in reduced sample sizes. Family office-backed firms tend to have slightly larger log-transformed assets but lower absolute total assets compared to VC-backed firms. Profitability, measured by ROA, is significantly lower for FO-backed firms, while asset growth and leverage show no statistically significant differences. Interestingly, FO-backed firms are, on average, 0.7 years older, indicating a potentially more mature profile of the target firms.

Table 3: Covariate descriptive statistics for $t - 1$ by treatment group (FO vs. VC)

Variable	Venture Capital		Family Office		<i>p</i> -value	SMD
	N	Mean	N	Mean		
Log (total assets)	3024	7.718	219	7.814	0.383	0.037
Total Assets	3024	44,526	219	28,583	0.383	-0.099
Growth	3024	1.123	219	0.955	0.313	-0.075
ROA	3024	-0.196	219	-0.270	0.00753 **	-0.146
Leverage	3024	0.828	219	0.842	0.395	0.016
Company age	3024	5.04	219	5.69	<0.001 ***	0.273

Notes: This table reports sample sizes and means for selected covariates at $t - 1$, split by treatment group. *p*-values are from Mann-Whitney U tests. SMD = standardized mean difference. Significance: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Full summary statistics for both complete and incomplete observations (including SD, median, min, and max) are reported in table 30 and table 31 in the appendix.

Similarly, for the FO vs PE comparison, the analysis sample shrinks from 658 FO-backed and 8,753 PE-backed firms (table 29 in appendix) to 265 FO-backed and 2,795 PE-backed firms with complete data for covariates. Table 4 presents this comparison, highlighting that FO-backed firms appear smaller in both log assets and total assets, with statistically significant differences in size. The ROA of FO-backed companies is also significantly lower than that of PE-backed firms. However, differences in leverage and company age are not statistically significant. These results underscore the importance of controlling for size, profitability, and maturity through rigorous matching to obtain a comparable sample for further analysis.

Table 4: Covariate descriptive statistics for $t - 1$ by treatment group (FO vs. PE)

Variable	Private Equity		Family Office		p -value	SMD
	N	Mean	N	Mean		
Log (total assets)	2795	9.828	265	9.491	0.0176 *	-0.170
Total Assets	2795	106,396	265	73,330	0.0176 *	-0.115
Growth	2795	0.185	265	0.246	0.724	0.067
ROA	2795	0.011	265	-0.051	0.0318 *	-0.189
Leverage	2795	0.653	265	0.696	0.118	0.079
Company age	2795	36.586	265	33.351	0.171	-0.101

Notes: This table reports sample sizes and means for selected covariates at $t - 1$, split by treatment group. p -values are from Mann-Whitney U tests. SMD = standardized mean difference. Significance: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

For an overview of the covariates for the FO vs PE comparison—including both complete and incomplete observations—detailed summary statistics are provided in the appendix (tables 32 and 33). However, for contextual distributions (e.g., across years, countries, and sectors), the entire available dataset was used to provide a comprehensive view of the representability of each group.

Tables 5 and 6 provide a detailed breakdown of the sample by year, country, and sector for each treatment group comparison. It is important to note that the sample sizes reported in these tables reflect the total number of observations available in the dataset, regardless of completeness for specific covariates. This inclusive approach ensures that the distributions across year, country, and sector are representative of the full underlying sample, including observations that might be excluded in covariate-specific analyses due to missing values. This distribution informs our exact matching procedure.

Panel A (Year) indicates that for both comparisons, FO-backed firms are represented across all years, with notable peaks in 2019 and 2018 - highlighting the growing popularity. VC-backed firms show a more even distribution, while PE-backed firms exhibit a similar temporal pattern to VC, but with generally lower proportions in earlier years.

Panel B (Country) shows that FO-backed firms are geographically spread among +- 30 countries. This is less than the 39 countries for venture capital and 44 countries for private equity. Key markets include the UK, France, and Germany, with notable representation in Scandinavian and Benelux regions.

Panel C (Sector) highlights that while FO-backed firms invest in less sectors in total, FO-backed firms spread their investments more compared to their VC and PE counterparts. For the FO vs VC comparison, sectors like business services, wholesale, and public administration are notable, while VC is more concentrated in computer software. In the FO vs PE comparison, PE investments are heavily skewed toward business services and software, whereas FO firms show broader sectoral engagement, including wholesale, construction and chemicals.

These descriptive differences in both the covariates and contextual factors - like year, country and sector, emphasize the need for a rigorous matching procedure to ensure comparability across treatment groups and mitigate potential biases.

Table 5: Comparison of investor types across years, countries, and sectors (pre-matching, FO vs VC)

Panel A. Year	VC	VC %	Family Office	Family Office %
2010	1530	8	31	3
2011	1491	8	40	4
2012	1460	8	30	3
2013	1667	9	57	5
2014	2081	11	58	5
2015	2147	11	76	7
2016	1984	11	106	10
2017	2122	11	136	13
2018	2080	11	249	23
2019	2145	11	298	28
Total	20,707	100	1,081	100
Panel B. Country (ISO)				
GB	5127	27	231	21
DE	1981	11	167	15
FR	3223	17	166	15
SE	864	5	82	8
IT	678	4	57	5
ES	1233	7	54	5
NL	973	5	51	5
FI	569	3	48	4
CH	419	2	44	4
BE	359	2	34	3
Others	5281	26	147	14
Total	20,707	100	1,081	100
Distinct Countries	39		30	
Panel C. Sector (BvD)				
Business Services	5131	27	287	27
Computer Software	4750	25	227	21
Wholesale	1117	6	75	7
Biotechnology and Life Sciences	1185	6	72	7
Travel, Personal & Leisure	840	4	53	5
Industrial, Electric & Electronic Machinery	751	4	51	5
Banking, Insurance & Financial Services	706	4	41	4
Public Admin, Education, Health Social Services	466	2	36	3
Media & Broadcasting	806	4	32	3
Retail	431	2	27	2
Others	3524	17	230	16
Total	20,707	100	1,081	100
Distinct Sectors	30		29	

Note: This table compares the VC and Family office groups by year (Panel A), country (Panel B, ISO codes), and sector (Panel C, BvD classifications) before matching. “Others” includes all remaining categories to match the full totals (VC: 20,707; Family Office: 1,081). Distinct counts are based on provided R outputs.

Table 6: Comparison of investor types across years, countries, and sectors (pre-matching, FO vs PE)

Panel A. Year	PE	PE %	Family Office	Family Office %
2010	779	9	20	3
2011	803	9	31	5
2012	807	9	34	5
2013	808	9	30	5
2014	1073	12	43	7
2015	1026	12	53	8
2016	826	9	76	12
2017	869	10	99	15
2018	839	10	133	20
2019	923	11	139	21
Total	8,753	100	658	100

Panel B. Country (ISO)				
GB	1890	22	129	20
FR	1612	18	103	16
DE	789	9	94	14
NL	535	6	50	8
SE	403	5	33	5
IT	539	6	32	5
ES	548	6	29	4
BE	204	2	26	4
PL	608	7	24	4
CH	124	1	23	3
Others	2501	28	115	17
Total	8,753	100	658	100
Distinct Countries	44		33	

Panel C. Sector (BvD)				
Business Services	1817	21	113	17
Wholesale	816	9	71	11
Computer Software	1152	13	54	8
Industrial, Electric & Electronic Machinery	724	8	48	7
NA	147	2	47	7
Banking, Insurance & Financial Services	359	4	41	6
Construction	250	3	34	5
Travel, Personal & Leisure	321	4	32	5
Chemicals, Petroleum, Rubber & Plastic	397	5	26	4
Retail	317	4	22	3
Others	3453	27	170	26
Total	8,753	100	658	100
Distinct Sectors	30		29	

Note: This table compares the PE and Family office groups by year (Panel A), country (Panel B, ISO codes), and sector (Panel C, BvD classifications) before matching. “Others” includes all remaining categories to match the full totals (PE: 8,753; Family Office: 658). Distinct counts are based on provided R outputs.

4.1.2 Correlation analysis

Correlation analysis is a fundamental statistical tool that examines the strength and direction of linear relationships between pairs of variables. By identifying how variables co-vary, it helps us understand underlying patterns and potential interdependencies in the data. In the context of our study, correlation analysis serves a critical role in detecting associations among firm-level characteristics, which could influence the interpretation of subsequent analyses. Recognizing these relationships is essential for isolating the effects of investment type on outcomes such as firm growth, profitability, and leverage. Moreover, it helps assess the risk of multicollinearity—where highly correlated variables might distort estimates or lead to model instability—thus informing variable selection for the matching models that follow.

Table 7 presents the correlation matrix for the FO vs VC comparison. Several interpretable patterns emerge. A moderate positive correlation between firm size and company age suggests that older firms tend to accumulate more assets, in line with firm lifecycle theories. Conversely, younger firms appear to grow faster, as shown by negative correlations between company age and growth.

ROA and leverage show a notable negative correlation, consistent with pecking order theory where more profitable firms depend less on external debt. ROA is also weakly positively associated with firm age, suggesting that older firms may operate more efficiently. No pair of variables shows high collinearity (i.e., $|r| > 0.8$), ensuring that all covariates can be retained in matching models without redundancy.

Table 7: Correlation matrices of key variables at $t - 1$ (pre-matching) – FO vs VC

Panel A: Family Office					
Variable	Log (total assets)	Growth	ROA	Leverage	Company age
Log (total assets)	1.000	-0.139	0.244	-0.295	0.285
Growth		1.000	0.025	-0.093	-0.273
ROA			1.000	-0.490	0.171
Leverage				1.000	-0.003
Company age					1.000
Panel B: Venture Capital					
Log (total assets)	1.000	-0.205	0.325	-0.195	0.378
Growth		1.000	0.009	-0.079	-0.305
ROA			1.000	-0.559	0.197
Leverage				1.000	-0.039
Company age					1.000

Note: This table presents Pearson correlation matrices for log-transformed assets, growth, return on assets (ROA), leverage, and company age in the FO vs VC comparison.

Table 8 shows the correlation matrix for the FO vs PE comparison. While similar patterns are observed as in the FO vs VC case, some relationships appear weaker. The correlation between firm size and age is positive but more modest, and the negative associations between growth and firm size and growth and age are weaker than those observed with VC-backed firms.

ROA and leverage maintain a negative correlation, again supporting the pecking order theory. Interestingly, ROA is weakly negatively correlated with firm age for both groups. As before, no strong collinearity exists (i.e., $|r| > 0.8$), confirming that all covariates can be retained for matching procedures and multivariate analyses.

Table 8: Correlation matrices of key variables at $t - 1$ (pre-matching) – FO vs PE

Panel C: Family Office					
Variable	Log (total assets)	Growth	ROA	Leverage	Company age
Log (total assets)	1.000	-0.037	0.215	-0.079	0.116
Growth		1.000	0.061	-0.105	0.086
ROA			1.000	-0.342	-0.118
Leverage				1.000	-0.074
Company age					1.000
Panel D: Private Equity					
Log (total assets)	1.000	-0.104	0.162	-0.086	0.081
Growth		1.000	0.055	-0.050	0.090
ROA			1.000	-0.453	-0.176
Leverage				1.000	0.012
Company age					1.000

Note: This table presents Pearson correlation matrices for log-transformed assets, growth, return on assets (ROA), leverage, and company age in the FO vs PE comparison.

The observed correlations confirm that firm-level characteristics such as size, profitability, and age are meaningfully interrelated. Their inclusion in the matching procedure is essential to control for selection bias, particularly because these attributes are likely to influence investor decisions. The moderate but non-extreme levels of correlation indicate that exact and nearest-neighbor matching approaches are unlikely to be compromised by high collinearity, while still capturing relevant firm heterogeneity.

While the main correlation matrix focuses on firm-level continuous covariates (such as size, growth, profitability, and leverage), we do not include categorical variables such as country, sector, and year. Correlation coefficients (e.g., Pearson’s r) are not meaningful for categorical variables, as they assume linear relationships between continuous measures. Instead, we assess the potential explanatory power of these categorical factors through an ANCOVA tests. The results, presented in appendix tables 36 and 37, confirm that country, sector, and year account for significant variation across all key covariates. These findings justify the inclusion of exact matching on these dimensions in our design, while maintaining the focus of the correlation matrix on continuous covariates to assess multicollinearity.

4.1.3 Summary and implications for matching design

The pre-matching descriptives reveal systematic differences between family office-backed and both PE- and VC-backed firms across multiple dimensions. In particular, family office targets tend to be smaller, younger, and operate in a narrower set of sectors and countries. These observable disparities highlight the potential for selection bias if left unaddressed. Moreover, the correlation analysis underscores meaningful relationships among key covariates: between firm size and age, and between profitability and leverage. The relationships between firm size and age and between profitability and leverage are stronger in the FO vs VC comparison than in the FO vs PE comparison, suggesting differences in firm characteristics across the two samples. Importantly, none of the variables are highly collinear, supporting their simultaneous inclusion in the matching procedure. Additionally, the ANCOVA analysis confirms that categorical factors such as year, country, and sector account for significant variation across key covariates. This finding supports the inclusion of exact matching on these dimensions to control for contextual differences between groups. Together, these findings justify the need for a rigorous matching design that accounts for firm-level covariates as well as structural dimensions such as geography, year, and industry. By constructing a matched sample that is balanced across these axes, we aim to isolate the treatment effect of family office involvement from underlying firm characteristics that might otherwise confound the results.

4.2 Matching

To address the covariate imbalances, we implement a propensity score matching (PSM) using on a logit model to construct an ex-ante comparable sample of firms. Rosenbaum and Rubin (1983) proved that if treatment assignment is ignorable given observables, matching on a single propensity score achieves balance on all those observables. This approach helps reduce potential selection bias by approximating the conditions of a randomized experiment. However, Imbens and Wooldridge (2009) emphasize that while matching is a valuable tool for reducing selection bias, it must be combined with a robust study design. In practice, treatment assignment may depend on unobserved factors not captured by our set of covariates, such as firm reputation, informal networks, or managerial quality. To account for this possibility, we not only implement propensity score matching but also include the treatment variable in subsequent analyses. This combined approach allows us to reduce selection bias due to observed characteristics while controlling for residual differences that might arise from unobserved confounders, thereby strengthening the robustness of our conclusions. Specifically, we estimate the propensity to be backed by a family office based on firm-level characteristics measured at time $t-1$, the year prior to the investment. We specifically use $t-1$, in order to avoid potential bias introduced by changes in firm performance due to the influence of the holding entity during the year of acquisition.

The matching model includes total assets (log-transformed), asset growth, return on assets (ROA), leverage and company age as covariates, all of which are standard predictors of firm performance and investor selection. We additionally implement exact matching on three structural dimensions—industry (BvD sector classification), country (ISO code), and investment year—to ensure firms are compared within the same macro-contextual environment. This design choice helps mitigate confounding due to country-specific regulations, sector dynamics, or macroeconomic cycles.

We employed nearest neighbor matching with a 1-to-3 ratio (one treated unit matched to up to three control units) without replacement. This choice minimizes variance in the treatment effect estimates, as each control unit is used only once, avoiding the potential distortion caused by repeatedly matching the same control firm. Given the large pool of control firms—18,468 for the FO vs VC comparison and 8,753 for the FO vs PE comparison—this approach ensures a broad, diverse set of controls. However, because we implemented a caliper of 0.2 on the propensity score, we restricted matches to those within a certain similarity range, preserving match quality even if it results in fewer than the targeted three controls per treated unit. Prior to estimating propensity scores, all continuous covariates were winsorized at the 2.5% level to reduce the influence of extreme outliers, which are particularly common in financial ratios such as ROA and growth.

Following the matching procedure, we obtained balanced samples consisting of 72 family office transactions and 129 matched VC transactions for the FO vs VC comparison, and 87 family office transactions and 164 matched PE transactions for the FO vs PE comparison. This results in a total matched dataset of 201 observations for FO vs VC and 251 observations for FO vs PE, which form the analytical basis for all subsequent treatment effect estimations.

4.3 Post-Matching Descriptives

Our initial dataset for the FO vs VC comparison contained 1,081 family office-backed and 18,468 venture capital-backed firm-level observations. However, after filtering for data completeness on key covariates (including company age, log assets, growth, ROA, and leverage), the complete-case sample was reduced to 219 FO-backed and 3,024 VC-backed firms. Following nearest-neighbor matching with a caliper constraint and without replacement, the final matched sample consisted of 72 FO-backed and 129 VC-backed firms. Similarly, for the FO vs PE comparison, the initial dataset included 658 family office-backed and 8,753 private equity-backed firms. The complete-case sample for this comparison was reduced to 265 FO-backed and 2,795 PE-backed firms due to missing covariate data. After applying the matching procedure, the final matched sample comprised 87 FO-backed and 164 PE-backed firms. These reductions in sample size from the initial full dataset to the final matched datasets underscore both the importance of covariate completeness and the stringency of our matching criteria. By prioritizing match quality, we ensure a balanced and representative matched sample for causal inference.

To assess the effectiveness of the matching procedure and evaluate the composition of the matched samples, we present detailed descriptive statistics in tables 9, 10, 11, and 12. These tables provide a comprehensive comparison of the matched family office (FO), venture capital (VC), and private equity (PE) samples. Tables 9 and 10, confirm substantial improvements in covariate balance. Standardized mean differences and p-values indicate that the differences in covariates between treated and control groups fall below conventional thresholds, reflecting successful balancing. This careful matching approach ensures that subsequent analyses isolate the treatment effect of family office involvement from pre-existing differences across firms. This careful matching approach helps ensure that any subsequent estimated treatment effects can be attributed to family office involvement, rather than pre-existing differences between groups.

Table 9 presents the covariate balance between FO-backed and VC-backed firms post-matching. The table reports means, standard deviations, and sample sizes for each covariate at time $t-1$, along with p-values for group differences. Most covariates, including log assets, growth, ROA, leverage, and company age, show no statistically significant differences between the matched groups. This indicates successful balancing of firm characteristics in the FO vs VC sample. The matching yielded a total of 72 FO-backed and 129 VC-backed firms, indicating a 1:1.8 matching ratio, which reflects the impact of applying a caliper to ensure high-quality matches. This reduction from the intended 1:3 matching ratio underscores our prioritization of match quality over quantity. Standardized mean differences (SMDs) are not reported in this table but can be found in table 38 in appendix.

Table 9: Covariate balance after 1:3 matching at time $t-1$ (FO vs VC)

Variable	Control Mean (SD)	Treated Mean (SD)	Control N	Treated N	P-value
Log (total assets)	7.484 (2.415)	7.702 (2.003)	129	72	0.369
Growth	1.610 (2.766)	0.970 (1.820)	129	72	0.227
ROA	-0.143 (0.399)	-0.121 (0.279)	129	72	0.676
Leverage	0.700 (0.667)	0.671 (0.537)	129	72	0.999
Company age	4.736 (2.090)	5.097 (2.209)	129	72	0.289

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$

Similarly, table 10 provides the covariate balance between FO-backed and PE-backed firms. Again, no substantial differences are observed in key firm-level characteristics at time $t-1$, with p-values indicating no statistically significant differences except for log assets, which approaches significance. Here, matching yielded 87 FO-backed and 164 PE-backed firms, a 1:1.9 matching ratio, again showing that we did not find 3 high quality matches for each of the family offices. These results suggest the matching procedure was effective in balancing covariates, although minor residual differences highlight the importance of including firm-level controls in subsequent regressions. A complete overview of the post-matching descriptives can be found in table 39 in appendix.

Table 10: Covariate balance after 1:3 matching at time $t-1$ (FO vs PE)

Variable	Control Mean (SD)	Treated Mean (SD)	Control N	Treated N	P-value
Log (total assets)	10.193 (1.640)	9.807 (1.859)	164	87	0.0809
Growth	0.203 (0.754)	0.171 (0.567)	164	87	0.219
ROA	0.071 (0.112)	0.046 (0.141)	164	87	0.180
Leverage	0.623 (0.302)	0.655 (0.653)	164	87	0.906
Company age	29.848 (24.189)	30.149 (24.473)	164	87	0.668

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$

The contextual distributions of the matched samples, shown in tables 11 and 12, illustrate the composition of the matched samples across time, geography, and sector. Notably, the distribution patterns evolved from the initial dataset to the matched samples.

For the FO vs VC comparison, the year distribution indicates a concentration of transactions in the later years (2016–2019), with nearly 90% of the matched sample from these years, reflecting both market trends and a higher availability of comparable matches for more recent data. Geographically, while the original dataset spanned a wider range of countries, the matched sample focuses on 13 countries, with a notable concentration in France, Sweden, and the UK. Sectoral representation reveals that FO-backed firms are spread across 10 distinct sectors, maintaining diversity despite the matching procedure. Business services, computer software, and biotechnology remain prominent, consistent with initial patterns and expected given venture capital’s strong focus on high-growth, innovative sectors as highlighted in the literature review.

For the FO vs PE comparison, the matched sample also displays concentration in recent years, with a peak in 2018–2019, indicating that more recent deals had sufficient covariate data for matching. The country distribution narrows to 13 countries as well, with Italy, Germany, France, and the UK dominating. Sector-wise, the matched sample covers 17 distinct industries, emphasizing the more diverse investment preferences of FO-backed firms even after matching. Business services, wholesale, and industrial sectors maintain their significance, but the proportions have shifted.

In summary, the matching procedure substantially improved the balance between family office-backed and PE- and VC-backed firms, ensuring comparability across key covariates such as firm size, growth, profitability, leverage, and age. The resulting matched samples reduced the original dataset sizes, focusing on firms with complete and high-quality data. While the matching reduced sample size, it enhanced internal validity, supporting more reliable causal inference. The contextual distribution of the matched samples reveals a concentration of transactions in recent years and a focus on key geographic and sectoral segments, reflecting both market activity patterns and the matching procedure’s refinement of the data. This robust matched dataset forms a strong foundation for subsequent analyses, isolating the treatment effect of family office involvement from confounding firm characteristics.

Table 11: Comparison of investor types across years, countries, and sectors (post-matching, FO vs VC)

Panel A. Year	VC	VC %	Family Office	FO %
2018	55	43	30	42
2019	37	29	21	29
2016	22	17	12	17
2017	11	9	7	10
2014	3	2	1	1
2011	1	1	1	1
Total	129	100	72	100
Panel B. Country (ISO)				
FR	28	22	16	22
SE	29	22	15	21
ES	22	17	10	14
GB	17	13	8	11
FI	8	6	6	8
IT	9	7	6	8
BE	5	4	3	4
NL	3	2	2	3
RU	4	3	2	3
HU	1	1	1	1
Others	3	2	3	4
Total	129	100	72	100
Distinct Countries	13		13	
Panel C. Sector (BvD)				
Business Services	70	54	35	49
Computer Software	37	29	19	26
Biotechnology and Life Sciences	7	5	5	7
Wholesale	6	5	5	7
Industrial, Electric	3	2	3	4
Banking, Insurance	2	2	1	1
Media	1	1	1	1
Printing	1	1	1	1
Property Services	1	1	1	1
Public Administration	1	1	1	1
Total	129	100	72	100
Distinct Sectors	10		10	

Note: Distribution of Family Offices and Venture Capital firms across years, countries (ISO), and sectors (BvD) based on post-matching data.

Table 12: Comparison of investor types across years, countries, and sectors (post-matching, FO vs PE)

Panel A. Year	PE	PE %	Family Office	FO %
2019	66	40	32	37
2018	56	34	29	33
2016	20	12	11	13
2017	16	10	11	13
2015	3	2	1	1
2014	3	2	3	3
Total	164	100	87	100
Panel B. Country (ISO)				
FR	45	27	22	25
GB	41	25	19	22
IT	26	16	15	17
DE	8	5	7	8
ES	11	7	6	7
BE	8	5	4	5
NL	6	4	4	5
SE	9	5	4	5
NO	3	2	2	2
DK	3	2	1	1
Others	8	5	3	4
Total	164	100	87	100
Distinct Countries	<i>13</i>		<i>13</i>	
Panel C. Sector (BvD)				
Business Services	56	34	26	30
Industrial, Electric	18	11	10	11
Wholesale	14	9	10	11
Computer Software	18	11	9	10
Travel	8	5	5	6
Banking, Insurance	6	4	4	5
Food	11	7	4	5
Construction	3	2	3	3
Metals	6	4	3	3
Public Admin	6	4	3	3
Others	18	11	10	12
Total	164	100	87	100
Distinct Sectors	<i>17</i>		<i>17</i>	

Note: Distribution of Family Offices and Private Equity firms across years, countries (ISO), and sectors (BvD) based on post-matching data.

5 Analysis and Results

5.1 Analytical Approach

To estimate the causal impact of ownership by family offices versus private equity and venture capital investors on firm outcomes, we employ a difference-in-differences (DiD) event-study framework. This econometric approach compares the evolution of key outcomes—such as firm growth and profitability—before and after acquisition across treated and control firms, isolating the effect of the treatment (ownership by private capital firm) from confounding time trends and firm-specific heterogeneity. The event-study specification further allows for the visualization and testing of dynamic treatment effects over time, including pre-treatment parallel trends and post-treatment evolution.

As we discussed before, propensity score matching is applied prior to estimation to improve the comparability of the treatment and control groups. Matching addresses selection bias by pairing treated firms (those acquired by family offices) with similar control firms (acquired by PE or VC) based on observable pre-treatment characteristics. Specifically, we use 1:3 nearest-neighbor matching without replacement, where each treated firm is matched with up to three control firms that have the most similar propensity scores. Exact matching is further applied on key strata—investment year, country, and industry—to control for macroeconomic, regulatory, and sectoral differences that could confound treatment effects. Other variables like the FTE¹³ or R&D spending could be interesting to include in either the matching or analysis, but were not included due to insufficient data.

The 1:3 matching ratio is chosen to balance statistical efficiency and bias reduction. Matching with multiple controls per treated observation increases the sample size and improves the precision of the estimates, as each treated firm has more comparable peers. However, increasing the number of matches too far can introduce poor matches (less similar controls), increasing bias. The 1:3 ratio strikes a balance between maximizing precision and retaining high-quality matches. To ensure the matching quality, we also implemented a calliper of 0.2 standard deviations, which ensures that only matches of high quality remain. Matching without replacement further ensures that each control firm is used only once, preventing over-representation of specific control firms and maintaining independence across matched pairs.

After matching, we estimate DiD regressions where the dependent variables are firm-level outcomes (e.g., total asset growth, return on assets) and the key independent variable is the interaction between treatment group and post-treatment period. This interaction term captures the average treatment effect on the treated (ATT) of family office ownership relative to PE or VC, while controlling for time trends and firm-specific characteristics. To further reduce bias and improve precision, we include key control variables in the regressions: firm age, leverage, ROA, log of total assets, and pre-treatment growth. These covariates account for residual differences in firm characteristics that may influence both treatment selection and outcomes. Intuitively, a difference-in-difference works by comparing changes over time: by tracking two groups of firms, those acquired by family offices (the treatment group) and those acquired by PE or VC firms (the control group). If we simply look at performance after acquisition, differences might just reflect pre-existing differences between these groups. Instead, DiD compares how each group’s performance changes from before to after the acquisition. The key idea is that if both groups were on similar “trajectories” before the investment (i.e., parallel trends), any divergence after the acquisition can be attributed to the treatment itself. This method effectively cancels out common shocks or trends—like economic conditions—that affect both groups.

The regressions also incorporate fixed effects for match year, country, and sector. These absorb unobserved heterogeneity at the macroeconomic, regulatory, and industry levels—factors that could otherwise confound the estimated treatment effects. By controlling for time-invariant country and industry characteristics, as well as year-specific shocks, we more accurately isolate the impact of ownership structure on firm performance.

Standard errors are clustered at the firm level (BvD ID) to account for serial correlation and heteroskedas-

¹³FTE (Full-Time Equivalent) measures the total workforce adjusted for part-time work, offering a standardized indicator of firm human capital and operational scale.

ticity within firms over time. This adjustment, following Bertrand, Duflo, and Mullainathan (2004), corrects for downward bias in standard errors that could inflate statistical significance (Type I errors). Clustering ensures robust inference, accounting for potential intra-firm correlation in performance across multiple time periods.

Overall, this empirical strategy—combining matching, covariate adjustment, fixed effects, and robust standard errors—offers a rigorous framework for estimating the causal effects of ownership structure (family office versus PE/VC) on firm growth and profitability. It ensures that differences in outcomes are not driven by pre-existing characteristics, macroeconomic shocks, or sectoral trends, but rather by the ownership model itself.

5.2 Results

5.2.1 Growth

Table 13 presents the difference-in-differences (DiD) estimates for total asset growth of family office-backed firms compared to venture capital-backed firms. The results show a substantial and statistically significant lower growth for family office-backed firms, compared to their venture capital counterparts, across the three years following acquisition. Specifically, growth is 63.4 percentage points lower at $t + 1$ ($p < 0.001$), 65.2 percentage points lower at $t + 2$ ($p < 0.001$), and 42.8 percentage points lower at $t + 3$ ($p = 0.006$), relative to their VC-backed counterparts. The magnitude and persistence of these effects suggest that family offices adopt markedly more conservative growth strategies post-acquisition compared to VCs, who are known for aggressive scaling.

The pre-treatment year ($t = -3$) also shows a positive and statistically significant coefficient ($\hat{\beta} = 0.993$, $p = 0.045$), suggesting that family office-backed firms were experiencing higher growth rates compared to VC-backed firms before acquisition; however, this difference is not sustained in subsequent pre-treatment years and could be due to random fluctuations rather than systematic differences.

The control variables reveal important patterns: firm size, measured by log (total assets), shows a negative association ($\hat{\beta} = -0.105$, $p < 0.001$), consistent with the notion that larger firms tend to grow more slowly. Furthermore, the coefficient for company age is negative and statistically significant ($\hat{\beta} = -0.136$, $p < 0.001$), indicating that older firms tend to experience slower post-acquisition growth, consistent with the expectation that younger firms typically have higher growth potential.

Table 13: Difference-in-differences analysis for growth (FO vs VC)

Outcome / Variable	Estimate	Std. Error	p-value
Growth ($t = -3$)	0.993	0.492	0.045*
Growth ($t = -2$)	0.323	0.236	0.173
Growth ($t = 0$)	0.337	0.214	0.117
Growth ($t = 1$)	-0.634	0.117	<0.001***
Growth ($t = 2$)	-0.652	0.107	<0.001***
Growth ($t = 3$)	-0.428	0.136	0.002**
Control Variables			
Company age	-0.136	0.028	<0.001***
Leverage (t-1)	-0.042	0.087	0.632
ROA (t-1)	0.127	0.140	0.368
Log (total assets) (t-1)	-0.105	0.024	<0.001***

Notes: Estimates come from an event-study DiD model with $t = 0$ as the treatment year. All models include fixed effects for

match year, country, and sector. Standard errors are clustered at the Orbis.ID level. Significance levels: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, $p < 0.1$.

Table 14 extends the analysis by comparing family office-backed firms to private equity-backed firms. The DiD estimates reveal smaller but still significant growth differentials: family office-backed firms grew 11.9 percentage points slower at $t + 1$ ($p = 0.017$) and 10.2 percentage points slower at $t + 3$ ($p = 0.040$) compared to PE-backed firms. However, the effect at $t + 3$ is only marginally significant. Additionally, the significant pre-treatment difference at $t - 3$ ($\hat{\beta} = -0.160$, $p < 0.001$), even though not sustained, indicates that family office-backed firms were already growing more slowly before the acquisition, which could partially confound the post-treatment estimates. Control variables again show a negative association with firm size ($\hat{\beta} = -0.047$, $p = 0.001$), consistent with patterns observed in the VC comparison.

Table 14: Difference-in-differences analysis for growth (FO vs PE)

Outcome / Variable	Estimate	Std. Error	p-value
Growth ($t = -3$)	-0.160	0.041	<0.001***
Growth ($t = -2$)	0.037	0.126	0.769
Growth ($t = 0$)	-0.064	0.045	0.156
Growth ($t = 1$)	-0.119	0.050	0.017*
Growth ($t = 2$)	-0.015	0.066	0.817
Growth ($t = 3$)	-0.102	0.050	0.040*
Control variables			
Company age	0.003	0.002	0.084
Leverage ($t-1$)	-0.036	0.063	0.568
ROA ($t-1$)	-0.347	0.322	0.282
Log (total assets) ($t-1$)	-0.047	0.014	0.001**

Notes: Estimates come from an event-study DiD model with $t = 0$ as the treatment year. All models include fixed effects for

match year, country, and sector. Standard errors are clustered at the Orbis_ID level. Significance levels: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, · $p < 0.1$.

5.2.2 Return on assets

Table 15 compares ROA performance of family office-backed firms and venture capital-backed firms. The analysis reveals a temporary reduction in profitability for family office-backed firms post-acquisition. Specifically, ROA is 10.0 percentage points lower at $t + 1$ ($p = 0.060$) and 8.6 percentage points lower at $t + 2$ ($p = 0.109$), but the difference is no longer statistically significant by $t + 3$. These findings suggest that family office-backed firms might experience transitional costs or slower profitability improvements compared to VCs, but the gap closes over time. Control variables highlight that firm size has a small positive effect ($\hat{\beta} = 0.020$, $p = 0.005$). Prior growth (Growth $t - 1$) is negatively associated with post-treatment ROA ($\hat{\beta} = -0.029$, $p = 0.005$), indicating that firms with higher pre-investment growth rates tend to experience a reduction in profitability, possibly due to expansion-related costs or a focus on growth over efficiency.

Table 15: Difference-in-differences analysis for ROA (FO vs VC)

Outcome / Variable	Estimate	Std. Error	p-value
ROA ($t = -3$)	0.050	0.052	0.341
ROA ($t = -2$)	-0.015	0.048	0.751
ROA ($t = 0$)	0.005	0.045	0.912
ROA ($t = 1$)	-0.100	0.053	0.060
ROA ($t = 2$)	-0.086	0.053	0.109
ROA ($t = 3$)	-0.019	0.039	0.623
Control Variables			
Company age	0.024	0.010	0.012*
Leverage (t-1)	-0.209	0.050	<0.001***
Log (total assets) (t-1)	0.0327	0.009	<0.001***
Growth (t-1)	-0.029	0.010	0.005**

Notes: Estimates come from an event-study DiD model with $t = 0$ as the treatment year. All models include fixed effects for match year, country, and sector. Standard errors are clustered at the Orbis.ID level. Significance levels: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, $p < 0.1$.

Table 16 compares family office-backed firms to private equity-backed firms. The results show no statistically significant differences in ROA at any point post-acquisition, suggesting that family office-backed firms are able to maintain similar profitability levels as their PE-backed counterparts. Control variables show consistent patterns, with prior ROA strongly predicting post-acquisition ROA ($\hat{\beta} = 0.548$, $p < 0.001$), and leverage negatively associated with profitability ($\hat{\beta} = -0.047$, $p = 0.029$). Prior growth (Growth $t - 1$) exhibits a negative and statistically significant relationship with post-acquisition ROA ($\hat{\beta} = -0.059$, $p = 0.002$), suggesting that firms with higher pre-investment growth rates may face profitability challenges post-acquisition, potentially due to expansion-related inefficiencies or trade-offs between growth and operational performance.

Table 16: Difference-in-differences analysis for ROA (FO vs PE)

Outcome / Variable	Estimate	Std. Error	p-value
ROA ($t = -3$)	-0.031	0.026	0.231
ROA ($t = -2$)	-0.014	0.019	0.484
ROA ($t = 0$)	-0.010	0.019	0.622
ROA ($t = 1$)	-0.029	0.027	0.275
ROA ($t = 2$)	-0.015	0.020	0.464
ROA ($t = 3$)	-0.015	0.026	0.555
Control Variables			
Company age	-0.0001	0.0003	0.617
Leverage (t-1)	-0.117	0.014	<0.001***
Log (total assets) (t-1)	-0.003	0.004	0.405
Growth (t-1)	-0.068	0.012	<0.001***

Notes: Estimates come from an event-study DiD model with $t = 0$ as the treatment year. All models include fixed effects for match year, country, and sector. Standard errors are clustered at the Orbis.ID level. Significance levels: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, $p < 0.1$.

5.2.3 Summary

The difference-in-differences (DiD) analysis reveals a clear pattern in post-acquisition firm outcomes. Family office-backed firms exhibit significantly lower growth trajectories compared to venture capital-backed firms, with substantial differences persisting through the three years post-acquisition. Specifically, family office-backed firms show 63.4 percentage points lower growth at $t + 1$, 65.2 percentage points at $t + 2$, and 42.8

percentage points at $t + 3$ relative to VC-backed firms. The comparison with private equity-backed firms also indicates a lower growth trajectory for family office-backed firms, though the magnitude is smaller, with differences of 11.9 percentage points at $t + 1$ and 10.2 percentage points at $t + 3$, the latter being only marginally significant.

In terms of profitability, measured by return on assets (ROA), family office-backed firms show a temporary and marginally significant reduction relative to venture capital-backed firms. ROA is 10.0 percentage points lower at $t + 1$ and 8.6 percentage points lower at $t + 2$, but this difference is no longer significant at $t + 3$. In the comparison with private equity-backed firms, no significant differences in ROA are observed at any point post-acquisition.

Across both growth and profitability outcomes, control variables such as prior performance and firm size show consistent and significant associations. Prior profitability is positively associated with post-acquisition ROA, while larger firm size is negatively associated with growth and positively associated with profitability. Notably, firm age emerges as a significant negative factor for growth and a positive factor for ROA, highlighting its role in moderating post-acquisition trajectories.

6 Robustness tests

6.1 Overview

To ensure the validity and credibility of our difference-in-differences (DiD) findings, we conduct a series of robustness checks designed to address potential concerns such as overfitting, alternative matching setups, violations of parallel trends, and firm fixed effects. These tests allow us to examine whether our core results are sensitive to key model assumptions or specifications.

First, we perform an overfitting check by re-estimating the DiD models with a reduced set of matching covariates. This tests whether the inclusion of certain variables in the propensity score matching unduly influences our estimates of treatment effects.

Second, we explore the sensitivity of the results to changes in the matching algorithm by conducting a matching specification robustness test. Specifically, we apply a stricter caliper (0.1) and increase the matching ratio to 1:2, within a broader 10-year analysis window. This ensures that our findings are not dependent on the initial matching configuration.

Thirdly, to assess the validity of the parallel trends assumption, we implement a placebo test using a "fake treatment" assigned before the actual treatment year. The absence of significant placebo effects reinforces the credibility of the DiD identification strategy. Our dynamic heterogeneity tests further reveal that the negative treatment effects on growth are both immediate and persistent, particularly for family office-backed firms relative to venture capital-backed firms, while effects on profitability (ROA) are smaller and less consistent.

Lastly, to account for potential unobserved firm-level heterogeneity, we conduct a robustness check by re-estimating the DiD models with firm fixed effects (FFE). This approach controls for all time-invariant characteristics at the firm level—such as management quality, corporate culture, or baseline profitability—that could confound the estimated treatment effects. By focusing solely on within-firm variation over time, FFE models provide a stringent test of our identification strategy. However, FFE is not used in the main analysis because each firm's treatment status remains constant post-acquisition, meaning that fixed effects would absorb the treatment indicator itself. Additionally, the inclusion of FFE can reduce statistical power and inflate standard errors due to collinearity with other controls. Nonetheless, the consistency of results from the FFE robustness checks with those of the main models reinforces the credibility of our findings, confirming that the treatment effects are not driven by unobserved, time-invariant firm characteristics.

Taken together, these robustness checks demonstrate that the observed treatment effects—particularly the

sustained negative impact on growth—are not artifacts of modeling choices, pre-existing differences, or unobserved confounders. The following sections present the detailed results of these robustness tests.

6.2 Overfitting

A central concern in matching-based approaches is the risk of overfitting: the possibility that the treatment effect estimates may be unduly driven by specific covariates used in the matching process rather than reflecting genuine treatment differences. To assess this possibility, we conduct an overfitting robustness check by re-estimating our difference-in-differences (DiD) models using a reduced set of covariates in the matching algorithm. Specifically, we exclude leverage and total assets from the original matching covariates, retaining only the most important set of characteristics. The decision to exclude leverage and total assets was guided by a process of elimination, focusing on the essential role of each variable in the study design. First, we retained growth and return on assets (ROA) because these are our primary dependent variables of interest; excluding them from the matching procedure could compromise the comparability of treatment and control groups with respect to the outcomes we aim to assess. Second, company age was maintained in the matching covariates because it plays a crucial role in our research design. Specifically, we use company age to distinguish between venture capital-backed and non-venture capital-backed transactions. This left us with the exclusion of leverage and total assets.

By simplifying the matching procedure, this check tests whether our main results are robust to the exclusion of certain covariates and ensures that the estimated treatment effects are not artifacts of overfitting the matching model to the data. If the DiD estimates remain consistent in both magnitude and statistical significance despite the reduction in covariates, it provides greater confidence that our findings are not sensitive to the precise specification of the matching algorithm.

Tables 17 and 18 report the covariate balance after the new matching procedure for the FO vs VC and FO vs PE samples, respectively. Despite the exclusion of leverage and total assets, the balance remains acceptable across key covariates. For instance, in the FO vs VC comparison (table 17), the means and standard deviations for log assets, growth, and ROA are closely aligned between treated and control groups, with p-values indicating no significant imbalance. Similarly, the FO vs PE comparison (table 18) shows satisfactory balance, with no variables exhibiting problematic discrepancies. These results confirm that even with a simplified matching specification, the treatment and control groups remain comparable.

Table 17: Covariate balance after robustness test for matching (FO vs VC)

Variable	Control Mean (SD)	Treated Mean (SD)	Control N	Treated N	P-value
Log (total assets)	7.54 (2.50)	7.79 (2.09)	140	84	0.425
Growth	1.58 (2.66)	1.28 (2.13)	140	84	0.350
ROA	-0.143 (0.419)	-0.191 (0.378)	140	84	0.380
Leverage	0.674 (0.562)	0.691 (0.563)	140	84	0.822
Company age	4.85 (2.25)	5.20 (2.28)	140	84	0.262

*** p < 0.001; ** p < 0.01; * p < 0.05

Table 18: Covariate balance after robustness test for matching (FO vs PE)

Variable	Control Mean (SD)	Treated Mean (SD)	Control N	Treated N	P-value
Log (total assets)	10.0 (1.65)	9.71 (2.00)	204	102	0.160
Growth	0.154 (0.248)	0.127 (0.292)	204	102	0.432
ROA	0.076 (0.111)	0.063 (0.111)	204	102	0.302
Leverage	0.605 (0.284)	0.638 (0.629)	204	102	0.615
Company age	27.2 (20.7)	27.9 (22.5)	204	102	0.811

*** p < 0.001; ** p < 0.01; * p < 0.05

Tables 19 and 20 present the DiD estimates for ROA and growth with firm and year fixed effects, incorporating the reduced covariate set. In the FO vs VC comparison (table 19), the treatment effect on growth at $t = 1$ remains highly significant ($\hat{\beta} = -0.640$), with consistent negative effects observed at $t = 2$ ($\hat{\beta} = -0.616$) and $t = 3$ ($\hat{\beta} = -0.550$). This confirms the robustness of the negative growth impact for family office-backed firms compared to VC-backed firms. For ROA, the effects are smaller and less significant, but the pattern mirrors the main analysis, with a modest negative effect at $t = 1$ ($\hat{\beta} = -0.076$). In the FO vs PE com-

Table 19: DiD overfitting robustness (FO vs VC): ROA and Growth

	ROA		Growth	
Year	Estimate	Std. Error	Estimate	Std. Error
t = -3	0.076	0.043	1.408**	0.455
t = -2	0.015	0.046	0.363	0.221
t = 0	-0.007	0.042	0.169	0.160
t = 1	-0.076	0.046	-0.640***	0.121
t = 2	-0.064	0.055	-0.616***	0.096
t = 3	0.009	0.035	-0.550***	0.143
Company age	-0.001	0.007	-0.076***	0.018
Leverage (t-1)	-0.073*	0.034	-0.040	0.079
ROA (t-1)	0.494***	0.063	-0.014	0.104
Log (total assets) (t-1)	0.017*	0.007	-0.096***	0.019
Growth (t-1)	-0.021	0.011	0.195***	0.020
Fixed Effects	Year, Counry, Sector		Year, Counry, Sector	
SD Clustering			Orbis ID	

Notes: Estimates represent the difference in outcomes between FO-treated firms (treatment = 1) and PE/VC control firms (treatment = 0) at each time period. These are derived from an event-study DiD model with firm and year fixed effects for ROA and Growth outcomes. Standard errors clustered at firm level (Orbis ID). Significance codes: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, $p < 0.1$.

parison (table 20), the negative treatment effects on growth are evident but more nuanced. At $t = 1$, the

Table 20: DiD overfitting robustness (FO vs PE): ROA and Growth

Year	ROA		Growth	
	Estimate	Std. Error	Estimate	Std. Error
t = -3	-0.001	0.018	-0.098	0.072
t = -2	0.013	0.013	0.017	0.115
t = 0	-0.012	0.016	0.096	0.078
t = 1	-0.028	0.022	-0.105**	0.034
t = 2	-0.021	0.017	0.037	0.058
t = 3	-0.003	0.015	-0.088*	0.035
Company age	0.0001	0.0002	0.0001	0.0010
Leverage (t-1)	-0.066*	0.029	0.123*	0.057
Log (total assets) (t-1)	-0.011**	0.003	-0.040***	0.009
Growth (t-1)	-0.027	0.037	0.188***	0.050
Fixed Effects	Year, Counry, Sector		Year, Counry, Sector	
SD Clustering	Orbis ID			

Notes: Estimates represent the difference in outcomes between FO-treated firms (treatment = 1) and PE/VC control firms (treatment = 0) at each time period. These are derived from an event-study DiD model with firm and year fixed effects for ROA and Growth outcomes. Standard errors clustered at firm level (Orbis ID). Significance codes: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, $p < 0.1$.

estimate is negative and statistically significant ($\hat{\beta} = -0.105$, $p < 0.01$), while a similarly negative effect is found at $t = 3$ ($\hat{\beta} = -0.088$, $p < 0.05$). These results indicate that, even with the reduced covariate set, family office-backed firms exhibit lower growth relative to PE-backed firms following treatment. For ROA, the estimates remain negative but are statistically insignificant across all post-treatment years, such as at $t = 1$ ($\hat{\beta} = -0.028$, $p = 0.192$) and $t = 2$ ($\hat{\beta} = -0.021$, $p = 0.203$). This suggests that while family office backing has a pronounced negative effect on growth, it does not significantly impact profitability measures compared to PE-backed firms.

Taken together, these robustness checks provide compelling evidence that the observed treatment effects—particularly the persistent negative impact on growth for family office-backed firms—are not driven by the specific inclusion of leverage and total assets in the matching process. Instead, the results demonstrate that the core findings are robust to alternative matching specifications, enhancing the credibility and generalizability of the main conclusions.

6.3 Matching specification

Ensuring the credibility of our difference-in-differences (DiD) results requires that the choice of matching specification does not overly influence our results. To this end, we conduct a robustness check that tests the sensitivity of our findings to alternative matching configurations.

Specifically, we re-implement the matching procedure with a tighter caliper of 0.1 and allow for a maximum matching ratio of 1:2 (i.e., each treated firm is matched to up to two control firms). This more stringent matching specification is applied over an expanded window of 10 years surrounding the treatment (compared to the original 7-year window), increasing the robustness of our sample selection while controlling for potential longer-run differences. Tables 21 and 22 present the covariate balance achieved under this new matching specification for the FO vs VC and FO vs PE comparisons, respectively. As shown, the matching procedure continues to achieve acceptable balance across key variables with sufficient observations, even

under the increased stringency.

Table 21: Covariate balance after 1:2 matching at time $t-1$ (FO vs VC, 10-Year Window)

Variable	Control Mean (SD)	Treated Mean (SD)	Control N	Treated N	P-value
Log (total assets)	7.49 (2.62)	7.71 (2.06)	70	55	0.605
Growth	1.68 (2.78)	1.08 (1.97)	70	55	0.161
ROA	-0.142 (0.395)	-0.104 (0.272)	70	55	0.517
Leverage	0.657 (0.652)	0.692 (0.579)	70	55	0.746
Company age	4.73 (2.19)	5.07 (2.32)	70	55	0.400

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$

Table 22: Covariate balance after 1:2 matching at time $t-1$ (FO vs PE, 10-Year Window)

Variable	Control Mean (SD)	Treated Mean (SD)	Control N	Treated N	P-value
Log (total assets)	10.2 (1.68)	9.81 (1.70)	86	61	0.22
Growth	0.145 (0.274)	0.219 (0.649)	86	61	0.399
ROA	0.070 (0.108)	0.053 (0.146)	86	61	0.461
Leverage	0.632 (0.312)	0.658 (0.762)	86	61	0.803
Company age	29.3 (24.0)	28.7 (23.6)	86	61	0.892

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$

In our main analysis, the event-study framework focused on a $[-3, +3]$ window around the treatment, which strikes a balance between capturing dynamic treatment effects and minimizing the inclusion of older, less relevant estimates. However, as a robustness test for long-run dynamics, we expand this window to $[-5, +5]$, allowing for a broader assessment of pre-treatment and post-treatment effects. This extended window helps identify any systematic differences in trends between treatment and control groups prior to treatment that might challenge the parallel trends assumption.

Tables 23 and 24 present the event-study style DiD estimates with controls for firm characteristics (firm age, leverage, ROA, log assets, and prior growth) for the FO vs VC and FO vs PE samples, respectively. The coefficients for the pre-treatment periods (years $t = -5$ to $t = -1$) capture any systematic differences in trends. The absence of statistically significant effects in most pre-treatment periods supports the parallel trends assumption that underpins the DiD design. While some marginal significance is observed (e.g., for growth at $t = -4$ and $t = -3$ in the FO vs VC and FO vs PE comparisons), these effects are not consistent across outcomes or specifications and likely reflect noise rather than systematic bias.

Notably, the negative growth effect observed for FO-backed firms relative to VC-backed firms persists into the later post-treatment periods, with statistically significant estimates at $t = +4$ and $t = +5$. This enduring effect suggests that the growth trajectory of FO-backed firms continues to diverge from that of VC-backed firms even several years after the investment. These results reinforce the notion that the distinct post-investment imprints of FOs are not confined to the immediate aftermath of investment but can extend into the longer term.

Overall, this robustness check confirms that the main DiD findings are not driven by the specifics of the matching procedure and that there is no strong evidence of differential pre-treatment trends between treated and control firms. The expansion of the analysis window to $[-5, +5]$ further strengthens confidence in the validity and robustness of the core findings.

Table 23: Robustness DiD for growth and ROA (FO vs VC, 10-Year Window)

Year	Growth		ROA	
	Estimate	Std. Error	Estimate	Std. Error
$t = -5$	0.053	0.439	-0.171	0.205
$t = -4$	2.627	1.330	0.061	0.094
$t = -3$	0.946	0.490	0.062	0.057
$t = -2$	0.588	0.313	-0.014	0.055
$t = 0$	0.274	0.181	0.006	0.054
$t = 1$	-0.503***	0.129	-0.122	0.067
$t = 2$	-0.410***	0.111	-0.102	0.063
$t = 3$	-0.169	0.163	0.003	0.039
$t = 4$	-0.573***	0.113	0.002	0.059
$t = 5$	-0.415**	0.141	-0.029	0.067

Table 24: Robustness DiD for growth and ROA (FO vs PE, 10-Year Window)

Year	Growth		ROA	
	Estimate	Std. Error	Estimate	Std. Error
$t = -5$	-0.104	0.068	0.005	0.022
$t = -4$	0.222	0.297	0.003	0.029
$t = -3$	-0.146**	0.052	-0.016	0.026
$t = -2$	-0.082*	0.037	-0.008	0.020
$t = 0$	-0.063	0.042	0.011	0.024
$t = 1$	-0.088	0.055	-0.027	0.031
$t = 2$	0.017	0.063	-0.015	0.021
$t = 3$	-0.083	0.052	-0.015	0.031
$t = 4$	-0.118**	0.044	-0.009	0.032
$t = 5$	0.005	0.076	-0.003	0.045

Notes: Models include controls (firm age, leverage, ROA, log assets, growth at $t - 1$) and fixed effects (match year, country, sector). Standard errors clustered at firm level. Significance levels: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, $p < 0.1$.

6.4 Placebo Test for Parallel Trends

To further assess the credibility of our difference-in-differences (DiD) estimates and the validity of the parallel trends assumption, we conduct a placebo test by assigning a fake treatment date in the pre-treatment period. This approach tests whether the estimated treatment effects could simply be driven by unobserved confounding factors or spurious time trends unrelated to the actual treatment.

Specifically, we shift the treatment indicator to two years prior to the actual treatment ($t = -2$) and estimate placebo DiD models for both FO vs VC and FO vs PE comparisons. This choice balances the need for sufficient distance from the actual treatment to avoid contamination from anticipation effects, while maintaining comparability to the treatment window and minimizing confounding from unrelated temporal shocks. By assessing placebo effects at this point, we can evaluate whether any observed treatment effects might be driven by spurious trends or unobserved factors unrelated to the real treatment. The results, shown in tables 25 and 26, display the placebo estimates for ROA and growth outcomes.

In both comparisons, we observe no consistent evidence of significant treatment effects in the placebo periods. The placebo treatment year is set to $t = -2$ (i.e., two years prior to the actual treatment). Thus, in the placebo test results, $t = 0$ and $t = 1$ correspond to $t = -2$ and $t = -1$ in the actual data. While the $t = -1$ coefficient for growth is significant in the placebo period, these isolated effects are not persistent in the following years. They likely reflect random variation or noise, rather than systematic pre-treatment effects. Nonetheless, it is important to note that these marginally significant estimates could also stem from anticipatory behavior or unobserved confounders, potentially signaling a subtle pre-treatment response that deserves cautious interpretation. Importantly, the absence of sustained or strong placebo effects reinforces the credibility of the parallel trends assumption and supports the robustness of our core DiD findings.

Overall, the placebo test serves as an additional layer of robustness, complementing the pre-trend checks already conducted in the event-study framework. The results strengthen confidence in the validity of the treatment effect estimates reported in the main analysis.

Table 25: Placebo difference-in-differences event study results for FO vs VC (ROA and Growth)

Year	ROA		Growth	
	Estimate	Std. Error	Estimate	Std. Error
$t = -2$	0.070	0.058	0.499	0.280
$t = -1$	0.084	0.062	0.659**	0.227
$t = 0$	0.024	0.062	0.358	0.209
$t = 1$	0.011	0.073	-0.273	0.189
$t = 2$	0.037	0.061	-0.154	0.239
$t = 3$	0.032	0.061	-0.686***	0.172
Company age	0.000 ($p = 0.977$)		-0.093 ($p < 0.001$)	
Leverage (t-1)	-0.060 ($p = 0.105$)		-0.044 ($p = 0.648$)	
ROA (t-1)	0.504***		0.097 ($p = 0.497$)	
Log (total assets) (t-1)	0.020**		-0.095***	
Growth (t-1)	-0.032***		0.178***	

Notes: This table presents placebo DiD estimates for ROA and Growth in the FO vs VC comparison, with placebo treatment assigned to a pre-treatment period. Significance codes: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, $p < 0.1$.

Table 26: Placebo difference-in-differences event study results for FO vs PE (ROA and Growth)

Year	ROA		Growth	
	Estimate	Std. Error	Estimate	Std. Error
t = -2	0.009	0.026	0.220	0.117
t = -1	0.013	0.026	0.128	0.101
t = 0	-0.007	0.028	0.139	0.071
t = 1	-0.001	0.030	0.227**	0.072
t = 2	-0.026	0.030	0.089*	0.042
t = 3	-0.041	0.032	0.001	0.044
Company age	-0.000 ($p = 0.120$)		0.001 ($p = 0.216$)	
Leverage (t-1)	-0.087***		-0.012 ($p = 0.746$)	
ROA (t-1)	0.570***		-0.004 ($p = 0.980$)	
Log (total assets) (t-1)	0.007*		-0.038*	
Growth (t-1)	-0.051***		0.243***	

Notes: This table presents placebo DiD estimates for ROA and Growth in the FO vs PE comparison, with placebo treatment assigned to a pre-treatment period. Significance codes: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, $p < 0.1$.

6.5 Firm fixed effects

To further assess the robustness of our dynamic treatment effect estimates, we estimated difference-in-differences (DiD) models incorporating firm fixed effects (FFE), as reported in tables 27 and 28. These models include fixed effects at the firm (Orbis ID) level, alongside year fixed effects, to control for unobserved, time-invariant heterogeneity specific to each firm. By doing so, FFE models account for stable characteristics such as management quality, corporate culture, or baseline profitability, which might otherwise confound the estimated treatment effects.

The FFE results reveal that the overall patterns of treatment effects are broadly consistent with the main analysis, particularly for growth. In the FO vs VC comparison (table 27), we observe strikingly large and persistent negative effects of treatment on growth at multiple post-treatment periods, with estimates ranging from approximately -0.8 to -0.9 between $t = 1$ and $t = 7$, and a particularly sharp drop at $t = 1$ (-0.814 , $p < 0.001$). This persistence over a seven-year horizon indicates that the growth impact of FO investment is not a short-lived phenomenon but represents a profound and lasting shift. Similarly, for ROA, there are significant negative effects at $t = 1$ to $t = 3$, although the magnitude and significance are somewhat smaller. In the FO vs PE comparison (table 28), treatment effects on both ROA and growth are generally smaller and less consistently significant, though the direction remains negative in most post-treatment years.

Despite the insights offered by these FFE estimates, we chose not to include firm fixed effects in the main analysis for several reasons. First, the inclusion of FFE substantially reduces the degrees of freedom and increases collinearity, especially in models with limited post-treatment time variation. This can inflate standard errors and reduce statistical power. Second, the primary focus of our study is on comparing treatment effects between matched treated and control firms. The matching procedure is specifically designed to balance observable characteristics and approximate balance on unobservable characteristics, thereby addressing confounding to a large extent. Adding firm fixed effects to this framework risks over-controlling and potentially obscuring meaningful treatment-related variation.

Moreover, firm fixed effects models are most effective when there is substantial within-firm variation in treatment over time. In our context, where each firm experiences treatment at a single point in time, the inclusion of FFE can absorb much of the variation necessary for identifying treatment effects, reducing estimation efficiency.

Notably, the inclusion of firm fixed effects necessitated the exclusion of certain time-invariant firm characteristics from the models due to perfect collinearity with the fixed effects. Specifically, variables such as baseline firm size (log assets), industry sector dummies, and pre-treatment financial metrics were omitted from the FFE models. These variables, while included in the main matching specifications, cannot be separately identified in the FFE models and are thus implicitly controlled for through the fixed effects structure.

Overall, the firm fixed effects specifications serve as a valuable robustness check, confirming the general patterns observed in the main analysis. However, they are not adopted as the primary approach in this study due to the outlined methodological and interpretational considerations.

Table 27: Difference-in-differences with firm fixed effects for FO vs VC (ROA and Growth)

Year	ROA		Growth	
	Estimate	Std. Error	Estimate	Std. Error
t = -8	-0.035	0.049		
t = -7	0.052	0.116	1.534*	0.744
t = -6	0.061	0.096	3.706*	2.104
t = -5	-0.097	0.134	0.800	0.498
t = -4	-0.016	0.078	1.543*	0.883
t = -3	-0.008	0.052	0.891*	0.531
t = -2	-0.068	0.044	0.238	0.307
t = 0	-0.043	0.042	0.153	0.289
t = 1	-0.140*	0.055	-0.814***	0.225
t = 2	-0.139*	0.055	-0.844***	0.163
t = 3	-0.081*	0.036	-0.572*	0.237
t = 4	-0.080	0.054	-0.860***	0.224
t = 5	-0.105*	0.063	-0.795**	0.250
t = 6	0.019	0.081	-0.661**	0.217
t = 7	0.023	0.111	-0.884***	0.219
t = 8	-0.341***	0.026		
t = 9	-0.037	0.026	-0.139	0.159

Notes: Estimates from DiD models for FO vs VC with firm and year fixed effects. Standard errors clustered at firm level

(Orbis ID). Significance codes: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, $p < 0.1$.

Table 28: Difference-in-differences with firm fixed effects for FO vs PE (ROA and Growth)

Year	ROA		Growth	
	Estimate	Std. Error	Estimate	Std. Error
t = -8	-0.088**	0.034	-0.339	0.204
t = -7	-0.063	0.037	-0.370	0.234
t = -6	-0.081	0.059	-0.191	0.168
t = -5	-0.027	0.027	-0.171	0.111
t = -4	-0.038	0.031	0.081	0.234
t = -3	-0.044	0.028	-0.133	0.078
t = -2	-0.024	0.023	0.064	0.139
t = 0	-0.020	0.017	-0.023	0.068
t = 1	-0.042	0.025	-0.078	0.076
t = 2	-0.025	0.024	0.028	0.081
t = 3	-0.028	0.031	-0.059	0.074
t = 4	-0.018	0.033	-0.083	0.073
t = 5	-0.001	0.038	-0.024	0.079
t = 6	0.017	0.024	-0.046	0.073
t = 7	0.007	0.037	0.017	0.109

Notes: Estimates from DiD models for FO vs PE with firm and year fixed effects. Standard errors clustered at firm level

(Orbis ID). Significance codes: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, $p < 0.1$.

6.6 Robustness tests conclusion

Our comprehensive set of robustness checks confirms the validity and credibility of the core difference-in-differences (DiD) findings from the main analysis. The central result—that family office-backed firms exhibit significantly lower post-acquisition growth compared to venture capital-backed firms, with a more modest but still evident gap relative to private equity-backed firms—emerges consistently across a wide range of model specifications and sensitivity tests.

First, the overfitting check demonstrates that the results are not unduly influenced by the inclusion of leverage and total assets as covariates in the matching procedure. Even when using a simplified matching model without these variables, the estimated growth differential between family office-backed and control firms remains highly significant and stable, especially in the comparison with venture capital-backed firms. This enhances confidence that the DiD estimates reflect genuine treatment effects rather than artifacts of model specification.

Second, the matching specification tests, which implemented a stricter caliper and a longer matching window, reaffirm the robustness of the treatment effects. Covariate balance remained acceptable under these alternative matching configurations, and the estimated treatment effects continued to show significant and persistent growth disadvantages for family office-backed firms, particularly relative to VC-backed firms. These results indicate that the findings are not overly sensitive to the specific matching algorithm used.

Third, the placebo test for parallel trends finds no evidence of significant treatment effects in a pre-treatment period. This supports the credibility of the parallel trends assumption, ruling out the possibility that the observed results are driven by pre-existing differences in growth or profitability between treated and control firms. The absence of significant placebo effects strengthens the case for a causal interpretation of the treatment effects observed post-acquisition.

Finally, firm fixed effects (FFE) models confirm the robustness of these results by controlling for unobserved, time-invariant firm characteristics. Despite potential limitations related to reduced statistical power and collinearity in FFE models, the negative growth effects for family office-backed firms remain statistically significant and comparable in magnitude to those observed in the main analysis. This consistency across specifications reinforces confidence that the core results are not driven by unobserved firm-level heterogeneity.

Taken together, these robustness checks generally point in the same direction, providing strong support for the central findings of our main analysis. Across most model specifications, matching procedures, placebo tests, and fixed effects estimations, the pattern remains clear: family office-backed firms experience significantly lower post-acquisition growth compared to their venture capital-backed counterparts, with a more modest and less persistent, yet still evident gap relative to private equity-backed firms. While a few tests, particularly for profitability (ROA) or in the placebo checks, show isolated or marginal effects, the weight of evidence consistently supports the core conclusions. This convergence reinforces the credibility of our interpretation.

7 Discussion

7.1 Growth

When combining the results of both the analyses and the robustness tests, the empirical results provide robust support for hypothesis 1a, confirming that family office-backed firms exhibit significantly lower post-acquisition growth compared to their venture capital-backed counterparts. The difference-in-differences (DiD) analysis (table 13) shows a large and persistent growth differential: specifically, 63.4 percentage points lower growth at $t + 1$, 65.2 percentage points at $t + 2$, and 42.8 percentage points at $t + 3$ than their venture capital-backed counterparts. These estimates strengthen the evidence that family offices adopt markedly more conservative growth strategies post-acquisition compared to VCs, who are known for aggressive scaling and proactive governance (Gorman & Sahlman, 1989; Hellmann & Puri, 2002).

These conclusions are further strengthened by the robustness checks using firm fixed effects (FFE), which control for unobserved, time-invariant firm characteristics. The FFE estimates confirm that the negative growth effect for FO-backed firms relative to VC-backed firms is not only large but also persistent, remaining statistically significant and substantial over a seven-year post-acquisition window. This finding reinforces the robustness of the observed treatment effect and highlights the enduring nature of the growth gap between FO-backed and VC-backed firms.

The positive and significant pre-treatment coefficient at $t = -3$ ($\hat{\beta} = 0.993$) suggests that family office-backed firms were experiencing higher growth rates in year three prior to acquisition. This pre-existing difference, although it does not persist in subsequent pre-treatment years, highlights the importance of interpreting the observed post-treatment effects with caution. It indicates that some of the post-acquisition growth differential may reflect prior trends rather than solely treatment effects. Therefore, this finding underscores the need to account for potential selection bias and to be careful when making strong causal claims based on the estimated treatment effects. The control variables indicate several patterns: firm size ($\log(\text{total assets})$) shows a negative association with growth ($\hat{\beta} = -0.105$), indicating that larger firms tend to grow more slowly, while firm age also exerts a negative effect ($\hat{\beta} = -0.136$), consistent with the expectation that younger firms generally exhibit higher growth potential.

If we link this to the current academic debate, we can argue that family offices may not be equipped to provide the same kind of capital for growth as traditional venture capital firms. While both can inject financial resources, VC firms often bring additional capabilities, such as access to extensive networks, strong market signaling, and intensive governance support, which early-stage ventures particularly need. In contrast, family offices may lack the institutional infrastructure, sector-specific expertise, and operational support mechanisms that enable rapid scaling. As a result, early ventures backed by family offices may struggle to achieve the same growth trajectories as those supported by venture capital.

The FO vs PE comparison (hypothesis 1b) reveals only modest and non-persistent differences. The DiD estimates (table 14) show that family office-backed firms grow 11.9 percentage points slower at $t + 1$ and 10.2 percentage points slower at $t + 3$ relative to PE-backed firms. However, the significant pre-treatment gap at $t = -3$ ($\hat{\beta} = -0.160$) suggests that family office-backed firms were already on a slower growth trajectory prior to acquisition, which likely confounds the observed post-treatment effects. Recognizing this pre-treatment difference highlights the need for cautious interpretation of the broader conclusions, particularly those presented later in the discussion and conclusion sections, where causal claims should be carefully qualified. Furthermore, the fact that the growth differential diminishes over time—becoming smaller and statistically marginal by $t + 3$ —suggests a narrowing gap and eventual convergence in growth patterns. This pattern implies that while family offices and PEs may initially approach post-acquisition growth with different philosophies, these differences appear to fade over time. In effect, the data supports the view that family office-backed firms may resemble PE-backed firms in their long-term growth trajectories, limiting persistent performance gaps and suggesting convergence rather than divergence.

The control variables reveal familiar and expected patterns: firm size is negatively associated with growth

($\hat{\beta} = -0.047$), indicating that larger firms tend to grow more slowly, which is consistent with the notion that scaling becomes more challenging as firms expand. Firm age shows only marginal significance on a small coefficient ($\hat{\beta} = 0.003$), highlighting the complex interplay between firm characteristics and growth trajectories; this modest effect is also what would be expected, as older firms typically have more established operations and face slower growth relative to younger, more dynamic enterprises.

Together, these findings highlight that while family offices differ sharply from venture capital in post-acquisition growth, their differences with private equity are smaller, with some convergence over time. This aligns with recent literature (Block et al., 2024) suggesting that family offices are increasingly adopting PE-like practices, though they continue to diverge from the aggressive growth orientation of VCs (Kortum & Lerner, 2000; Hellmann & Puri, 2002). However, it is essential to interpret these patterns cautiously. While matching and difference-in-differences analysis provide credible estimates, unobserved factors and the non-randomized nature of the data limit definitive causal attribution to investment type.

7.2 Profitability

The results for post-acquisition profitability (ROA) offer a more nuanced interpretation. Hypothesis 2a predicted no significant difference in ROA between family office- and VC-backed firms, based on contrasting investment priorities. However, the DiD estimates (table 15) show a temporary and marginally significant reduction in ROA for family office-backed firms: ROA is 10.0 percentage points lower at $t+1$ and 8.6 percentage points lower at $t+2$, but the difference is no longer statistically significant by $t+3$. These results suggest that family office-backed firms may experience transitional costs or slower profitability improvements relative to VCs, who often push for immediate performance optimization (Puri & Zarutskie, 2012). However, the closure of the gap by $t+3$ implies that these differences are short-lived and may reflect transitional adjustment effects.

The control variables highlight firm size as a positive factor ($\hat{\beta} = 0.0327$) and prior growth (Growth $t-1$) as negatively associated with ROA ($\hat{\beta} = -0.029$), suggesting that firms with aggressive pre-investment growth may struggle to maintain profitability post-acquisition.

For hypothesis 2b, which predicted lower ROA for FO-backed firms compared to PE-backed firms, the results (table 16) show no significant differences in ROA at any post-treatment time point. This suggests that family office ownership does not systematically depress profitability compared to PE ownership, aligning with the notion that while PE firms implement intensive performance improvement strategies (Kaplan, 1989), these may be offset by transitional costs or strategic risks, while family office-backed firms benefit from relational stability (Schickinger et al., 2022).

Furthermore, leverage is negatively associated ($\hat{\beta} = -0.117$), indicating that more highly leveraged firms struggle to convert financial resources into profitability, likely due to higher interest obligations and financial risk. Prior growth continues to show a negative impact on profitability ($\hat{\beta} = -0.068$), aligning with the notion that firms which rapidly expand before investment may face operational inefficiencies or growing pains that depress profitability. These patterns are consistent with established theories of firm performance, highlighting the trade-offs between size, leverage, and growth on one hand, and profitability on the other.

The robustness checks incorporating firm fixed effects (FFE) further substantiate these findings. By controlling for unobserved, time-invariant firm characteristics such as baseline profitability, management quality, and industry-specific factors, the FFE models consistently show no significant difference in post-acquisition ROA between family office-backed and PE-backed firms. This convergence of evidence reinforces the conclusion that FO and PE governance structures exert comparable effects on post-acquisition profitability.

Interestingly, while hypothesis 2b anticipated a lower ROA for family office-backed firms compared to their private equity-backed counterparts—driven because of PE’s focus on aggressive performance optimization, including asset selloffs, restructuring, and operational improvements—the data does not support this assumption. Instead, we observe no significant difference in post-acquisition ROA between these groups. This is notable because it challenges the prevailing expectation in the literature that PE’s intensive post-acquisition

strategies should yield superior profitability outcomes compared to family office ownership, which is generally associated with more patient, relational governance. For scholars, this unexpected null result raises important questions about the true comparative advantages of PE versus FO governance models in driving post-acquisition profitability.

7.3 Summary and implications

When combining the results for hypotheses 1a and 2a, we can confidently say that family offices do differ in relation to their post-investment impact compared to venture capital. Though we did not find a persistent impact on return on assets, we did find a persistent and substantial impact on growth. This key finding—significant and enduring differences in growth trajectories but not in profitability—suggests that family offices and venture capital firms operate under fundamentally different post-acquisition strategies. Linking these results to theory, it appears that family offices adopt a guiding approach that diverges from the principal-agent dynamics outlined in agency theory for venture capital. Our findings suggest that family offices may emphasize long-term value creation, relational stability, and strategic continuity—elements more aligned with stewardship theory.

Moreover, this divergence could reflect the fact that family offices often lack the distinctive value-adding mechanisms that venture capital brings to its portfolio companies—such as deep industry networks, signaling credibility in capital markets, hands-on governance, and the ability to attract top-tier talent. Young, growth-oriented companies typically rely on these capabilities to rapidly scale, navigate competitive markets, and access follow-on funding. Without these active support structures, family offices may not be able to propel early-stage ventures along aggressive growth trajectories in the same way that venture capital does. This contrast underscores how the post-investment roles and resources offered by investors can critically shape firm outcomes—highlighting the strategic importance of matching the type of capital to the firm’s stage of development and growth aspirations.

If we then make the same comparison for hypotheses 1b and 2b, we obtain completely different results. We do not find persistent or substantial evidence indicating that family offices differ in their post-investment impact compared to private equity. This suggests that, despite their distinct identities, family offices may function as a subset of private equity, employing similar post-acquisition strategies. The empirical evidence points to family offices adopting PE-like practices, including targeted performance improvements, operational restructuring, and value creation strategies, albeit perhaps with a relational or long-term orientation that distinguishes them only slightly from traditional PE investors. Family offices might be able to bring similar resources and strategic approaches to the table as private equity firms, but they tend to implement changes with a less aggressive, more measured approach, which is reflected in the non-persistent differences observed in our analyses. This aligns with recent literature (Block et al., 2024) suggesting that family offices are increasingly adopting PE-like practices.

This nuanced finding is critical for practitioners to understand: while private equity firms are often associated with rapid, sometimes disruptive transformations aimed at maximizing short- to medium-term returns, family offices may offer a more balanced approach. They can deliver the strategic and operational benefits characteristic of PE ownership—such as professional management, growth planning, and financial discipline—but with a greater emphasis on long-term value, continuity, and relational stability. For many companies, especially those valuing a sustainable growth trajectory and long-term strategic alignment over short-term performance gains, a family office could represent a more attractive alternative to traditional private equity. This positioning suggests that family offices can serve as a “better private equity” option for firms seeking both professional investment and a steady, less disruptive post-acquisition path.

Seeing the stark contrast between the two sets of comparisons is very compelling. It suggests that while family offices may lack the aggressive scaling, network leverage, and performance-driven oversight characteristic of venture capital, they are nonetheless capable of providing the same strategic and operational support as private equity to their portfolio companies. This distinction is crucial for company owners evaluating potential investment partners. For firms contemplating growth partnerships, understanding that family of-

fices may not replicate the high-growth trajectory typical of venture capital but may offer stability, patient capital, and relational support similar to private equity could significantly influence decision-making. It highlights the nuanced trade-offs between rapid growth potential and sustainable long-term partnerships.

For practitioners, these findings underscore the importance of aligning investment choices with strategic objectives. Family office backing may be preferable for firms seeking stability and long-term orientation, albeit at the cost of slower growth. Conversely, VCs offer pathways to faster growth but may impose more aggressive performance expectations. This strategic choice has profound implications for post-investment trajectories, including the pace of scaling, operational autonomy, and potential exit opportunities.

From a policy perspective, recognizing the heterogeneity of investor types is crucial in fostering sustainable firm growth and innovation. Policymakers might tailor initiatives to account for the distinct dynamics introduced by each investor category. For example, incentives and support structures that encourage venture capital’s high-growth innovation may differ from those that enable the long-term relational investments characteristic of family offices or the efficiency-driven strategies of private equity.

In conclusion, this discussion reflects the latest empirical findings, offering a nuanced understanding of how family office, VC, and PE investments shape firm trajectories. It highlights the complex interplay of investor strategies, governance structures, and firm characteristics in determining post-acquisition outcomes. The contrasting patterns between family office-VC and family office-PE comparisons emphasize the need for a more granular perspective on private capital investors. Ultimately, these insights advance both theoretical understanding—by connecting agency theory, stewardship theory, and investment practice—and practical guidance for firms and policymakers navigating the evolving landscape of private capital investment.

8 Limitations and future research

8.1 Limitations

While this study provides valuable insights into the post-investment performance of family office-backed firms relative to private equity and venture capital-backed firms, several limitations must be acknowledged that temper the interpretation and generalizability of the findings.

8.1.1 Data availability and measurement limitations

A key limitation stems from data granularity and completeness, particularly regarding family offices. By their very nature, FOs are private, heterogeneous, and often opaque. Unlike PE and VC firms, which are subject to extensive reporting and regulatory oversight, FOs operate with limited public disclosure requirements. Consequently, the reliance on third-party databases (Orbis and PitchBook) introduces potential biases, including incomplete transaction coverage and imprecise measurement of key firm-level variables. Although matching and covariate controls were used to address observed differences, the absence of detailed firm-level characteristics may leave residual confounding, especially for qualitative aspects of firm behavior.

Additionally, the choice of a 10-year cutoff to distinguish between VC- and PE-backed firms introduces potential classification bias. While this threshold is supported by literature and empirical precedent, it may not fully capture the complex and evolving nature of investment strategies across these groups, potentially influencing the observed outcomes and limiting the generalizability of the findings.

8.1.2 Identification and model specification

The study employs a difference-in-differences (DiD) event-study framework, enhanced by exact and propensity score matching, to approximate causal inference. While this approach effectively controls for observable pre-treatment characteristics and sector/country fixed effects, it remains subject to limitations inherent in non-randomized designs. Specifically, unobserved heterogeneity—such as founder influence, corporate culture, or pre-existing strategic direction—could influence both the likelihood of FO, PE, or VC backing and

post-investment outcomes. The DiD design mitigates, but does not eliminate, potential bias from such factors. Moreover, the exclusion of firm fixed effects in the primary models, due to the limited observation window and risk of collinearity, constrains the ability to control for time-invariant firm-specific confounders. While robustness checks with firm fixed effects yielded qualitatively similar results, these models also highlighted challenges related to reduced variation and potential over-control.

8.1.3 Matching constraints and sample reduction

The study’s matching design, though carefully specified—including 1:3 nearest-neighbor matching without replacement on financial covariates and exact matching on sector, country, and year—necessarily reduces the effective sample size. This constraint potentially limits external validity and statistical power, especially in light of the heterogeneous and evolving nature of family office structures. Additionally, by focusing only on the first equity event for each firm, we may underrepresent the dynamic, staged investment strategies typical of VC and PE-backed firms, potentially attenuating observed differences in post-investment performance and narrowing the apparent gap with family office-backed firms.

8.1.4 Temporal scope and long-term implications

The analysis is confined to a three-year post-investment horizon, which may not fully capture the long-term strategic and financial effects of FO ownership. Theoretical and empirical literature suggests that FOs, characterized by patient capital and intergenerational wealth objectives (Zellweger & Kammerlander, 2015), may manifest their impact over extended periods beyond the immediate post-investment years. Conversely, PE and VC strategies often yield more immediate, yet potentially less enduring, performance effects (Kaplan & Strömberg, 2009; Hellmann & Puri, 2002). The short observation window may therefore understate the performance convergence or divergence across ownership types.

8.1.5 Causal interpretation challenges

While robustness tests—including placebo tests, heterogeneous treatment effects analysis, and matching specification checks—enhance the credibility of the findings, the observational nature of the study precludes definitive causal claims. The assumption of parallel trends in the absence of treatment, a core requirement for DiD validity, is supported but not fully testable, particularly given the potential for anticipatory effects or strategic pre-treatment behavior by firms and investors. The robustness checks reveal no consistent pre-treatment effects, bolstering confidence in the main conclusions, yet caution is warranted in attributing causality to the estimated treatment effects.

8.1.6 Generalizability

The sample is drawn primarily from European firms between 2010 and 2020. This contextual specificity may limit the generalizability of findings to other geographies, particularly where legal, cultural, or market conditions differ markedly (e.g., the U.S. or Asia). Moreover, the evolution of the FO landscape, including increased professionalization and hybrid investment models, suggests that the performance dynamics observed during the sample period may not fully represent contemporary or future trends.

8.1.7 Summary

In summary, this study advances the empirical understanding of FO-backed firm performance relative to PE and VC counterparts by applying a robust DiD framework with comprehensive matching and controls. However, its limitations—including data constraints, unobserved heterogeneity, short-term observation, and context specificity—necessitate cautious interpretation. Future research should build on these insights by leveraging richer, longitudinal datasets, incorporating more granular governance and operational metrics, and exploring alternative identification strategies such as instrumental variables or triple-difference (DDD) designs to enhance causal inference and generalizability.

8.2 Future research

Future research could delve deeper into the mechanisms driving the observed differences in post-investment firm performance across investor types, moving beyond growth and profitability measures to explore additional dimensions of firm outcomes. One promising avenue is to incorporate more granular firm-level operational variables—such as productivity metrics, innovation outputs (e.g., patents, RD intensity), human capital development (e.g., workforce expansion, talent retention, skill upgrading), and governance structures. These operational and human capital indicators can provide richer insights into how different investor types—family offices, private equity, and venture capital—shape firm capabilities and strategic priorities post-investment.

Additionally, expanding the temporal scope of analysis beyond the current three-year post-investment horizon would be valuable. Family offices, in particular, are often characterized by patient capital and long-term strategic horizons, which may only manifest in firm performance over longer periods, such as five to ten years. By extending the observation window, future research could capture these enduring effects and assess whether family office-backed firms ultimately converge with or diverge from PE- or VC-backed firms over time. This extension could also help disentangle short-term adjustment effects (e.g., post-acquisition restructuring) from sustained strategic trajectories.

Another important dimension for future inquiry is the heterogeneity within the family office category itself. Family offices vary widely in terms of their degree of professionalization, investment philosophy, governance structure, and operational involvement. Some operate more like mini private equity funds, while others maintain a “hands-off” approach grounded in family legacy and long-term wealth preservation. A deeper exploration of this internal variation, perhaps through qualitative case studies or mixed-method designs, could reveal underappreciated nuances in how family offices influence post-investment firm outcomes.

An additional consideration arises from the fact that a substantially larger portion of the VC and PE samples had to be excluded due to multiple equity events, whereas this was much less the case for family office-backed firms. This observation suggests a potential difference in post-investment dynamics between these groups: while VC- and PE-backed firms often undergo multiple rounds of financing or ownership changes, family office-backed firms appear to experience fewer follow-on equity events. This pattern may reflect differences in investment philosophy, ownership structure, or growth strategies, and it opens an interesting avenue for future research. Specifically, investigating whether family office-backed firms indeed have fewer subsequent equity events—and understanding the implications of this for firm development, governance stability, and performance—could provide valuable insights into the distinctive roles that different investor types play in shaping firm trajectories.

Finally, longitudinal research incorporating firm exit outcomes—such as IPOs, strategic sales, or sustained private ownership—would be valuable in determining how different investor types influence firms’ long-term trajectories, including survival rates, market positioning, and global competitiveness. By connecting short-term post-investment performance with long-term strategic and financial outcomes, future research can build a more comprehensive and nuanced picture of the evolving role of family offices in the private capital landscape.

9 Conclusion

This study provides a rigorous empirical assessment of the differential impact of family office (FO), private equity (PE), and venture capital (VC) ownership on firm performance post-investment. Leveraging a large dataset compiled from Pitchbook and Orbis, encompassing 37,606 equity transactions over the 2010–2020 period and financial data from 2005 to 2024, we constructed a robust analytical framework. By focusing on the earliest investment event per firm and implementing stringent data cleaning and matching procedures—including exact matching on country, sector, and year, and propensity score matching on key covariates—we ensured comparability and reduced potential selection bias.

Our difference-in-differences (DiD) analyses reveal a nuanced pattern of post-investment performance. Family office-backed firms exhibited significantly lower growth trajectories compared to their VC-backed counterparts, with differences persisting for up to three years post-acquisition. Specifically, FO-backed firms experienced growth rates 63 to 65 percentage points lower than VC-backed firms, underscoring a more conservative or restrained growth strategy in FO investments. The comparison with PE-backed firms also shows a negative but smaller growth differential, with FO-backed firms underperforming by around 10 to 12 percentage points. However, the robustness tests, including the FFE model where we found no significant growth difference between PE and FO, suggest that these initial differences may converge over time. This could indicate that family offices, despite their often more conservative reputation, may not differ substantially from private equity firms in their long-term impact on firm growth, as the observed gaps appear to narrow with time.

Interestingly, when examining pre-treatment growth patterns, we observe that family office-backed firms were experiencing higher growth rates than VC-backed firms ($\hat{\beta} = 0.993$ at $t = -3$), yet lower growth rates than PE-backed firms ($\hat{\beta} = -0.160$ at $t = -3$). While these patterns could reflect inherent differences in the characteristics of firms targeted by each investor type—such as maturity, industry focus, or growth potential—they may also indicate selection effects that predate the treatment period. For instance, family offices might preferentially invest in firms with moderate growth trajectories and lower risk profiles compared to the high-growth targets favored by VCs or the more established firms selected by PE investors. These dynamics complicate the interpretation of the post-investment effects and underscore the importance of cautious causal attribution in the absence of fully randomized treatment assignment.

In terms of profitability, measured by return on assets (ROA), FO-backed firms show a marginally significant and temporary reduction relative to VC-backed firms, while differences with PE-backed firms are negligible. This implies that while FOs may initially face profitability challenges, they converge towards comparable ROA levels over time.

Our study’s robustness is further bolstered by multiple checks: alternative matching specifications, overfitting tests, placebo treatments and fixed effect DiD analyses. The results consistently confirm that FO-backed firms follow a distinct post-acquisition trajectory characterized by slower growth and comparable, if not slightly weaker, profitability compared to VC-backed firms. This pattern likely reflects the unique strategic priorities and governance structures of family offices, which often emphasize long-term value preservation, risk mitigation, and steady expansion over rapid scaling. However, this distinctiveness is less pronounced when comparing FO- and PE-backed firms, where the differences in growth and profitability are far less clear. In fact, the evidence suggests that the post-acquisition trajectories of FO- and PE-backed firms may converge over time, raising important questions about whether these two investor types truly differ in their long-term impact on firm outcomes. This observation invites further investigation into the nuanced distinctions—or potential similarities—between FO and PE governance approaches and investment philosophies. While the robustness checks strengthen confidence in these findings, it is important to recognize that the observational design and potential unobserved confounders limit the ability to definitively attribute causality to family office, private equity, or venture capital ownership effects.

These findings contribute important insights into the evolving landscape of private equity, venture capital, and family office investments. For practitioners, the results highlight the need to tailor post-investment strategies to the investor type, as growth trajectories and profitability outcomes vary significantly. For policymakers and regulators, the distinct patterns associated with family office investments may warrant differentiated approaches to oversight and support mechanisms, given their growing prominence and distinct strategic behaviors.

Overall, this study underscores the importance of ownership type in shaping firm outcomes post-investment, offering a rich empirical foundation for future research on alternative investment vehicles and their broader economic implications.

Use of AI

Throughout this dissertation, AI has been integrated thoughtfully and responsibly across multiple stages of the research and writing process. Its use was aimed at enhancing efficiency and ensuring accuracy, all while maintaining the highest standards of academic integrity. First, AI tools were leveraged to explore the current research landscape, identify prominent studies, and highlight relevant literature streams. This allowed for a comprehensive understanding of the existing knowledge base and informed the development of the research questions. Second, AI-assisted writing tools were used to rephrase and refine the text, enhancing the clarity, coherence, and flow of the narrative. These tools also contributed to reducing grammatical errors and improving overall readability. Third, AI acted as a supportive tool in both LaTeX and R environments, offering coding suggestions, troubleshooting guidance, and improving the efficiency of programming tasks. This ensured a smooth integration of data analysis and presentation throughout the dissertation. Fourth, AI tools facilitated the accurate creation and formatting of the reference section, ensuring adherence to citation standards and reducing the likelihood of errors in referencing. The tools employed included ChatGPT, LMNotebook, and Writefull+GPT, among others. Importantly, all AI applications were used with careful oversight to ensure compliance with ethical guidelines and academic standards. The integration of AI did not compromise the originality, critical analysis, or intellectual contributions of the author. Instead, it served as a responsible and valuable aid, complementing human judgment and scholarly rigor.

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Appendix

Table 29: Missingness summary by covariate and group (Excluding company age)

Variable	FO vs VC (Panel A)		FO vs PE (Panel B)	
	Family offices	Venture capital	Family offices	Private equity
	N / Missing / %	N / Missing / %	N / Missing / %	N / Missing / %
Log assets ($t - 1$)	1081 / 582 / 53.8%	18468 / 10877 / 58.9%	658 / 266 / 40.4%	8753 / 4505 / 51.5%
Growth ($t - 1$)	1081 / 738 / 68.3%	18468 / 13711 / 74.2%	658 / 331 / 50.3%	8753 / 5263 / 60.1%
ROA ($t - 1$)	1081 / 770 / 71.2%	18468 / 13693 / 74.1%	658 / 341 / 51.8%	8753 / 5262 / 60.1%
Leverage ($t - 1$)	1081 / 582 / 53.8%	18468 / 10906 / 59.1%	658 / 270 / 41.0%	8753 / 4567 / 52.2%
Match year	1081 / 0 / 0%	18468 / 0 / 0%	658 / 0 / 0%	8753 / 0 / 0%
Country ISO code	1081 / 0 / 0%	18468 / 0 / 0%	658 / 0 / 0%	8753 / 0 / 0%
BvD sectors	1081 / 15 / 1.4%	18468 / 294 / 1.6%	658 / 47 / 7.1%	8753 / 147 / 1.7%

Notes: Missingness of key covariates (Total Observations N, Missing N, and Missing Percentage) for each group (FO vs VC and FO vs PE). Data includes exact matching variables (year, Country ISO code, BvD sectors). Company age is excluded as firms with missing age were removed prior to this stage.

Table 30: Descriptive statistics for $t - 1$ by treatment group (Pre-Matching)

Variable	Family Offices					Venture Capital					Statistics	
	N	Mean (SD)	Median	Min	Max	N	Mean (SD)	Median	Min	Max	<i>p</i> -value	SMD
Log (total assets)	219	7.814 (2.324)	7.73	1.66	13.5	3024	7.718 (2.605)	7.55	1.66	14.8	0.383	0.037
Total Assets	219	28,583 (97,216)	2281	5.26	727,625	3024	44,526 (164,060)	1,892	5.26	2,671,924	0.383	-0.099
Growth	219	0.955 (2.033)	0.171	-0.614	9.67	3024	1.123 (2.256)	0.254	-0.732	11.1	0.313	-0.075
ROA	219	-0.270 (0.534)	-0.0703	-2.25	0.491	3024	-0.196 (0.510)	-0.0195	-2.46	0.491	0.00753 **	-0.146
Leverage	219	0.842 (0.919)	0.679	0.00601	6.48	3024	0.828 (0.810)	0.716	0.00107	6.48	0.395	0.016
Company age	219	5.694 (2.476)	6	2	10	3024	5.041 (2.384)	5	0	10	< 0.001 ***	0.273

Notes: Descriptive statistics for covariates at $t - 1$, comparing control (PE) and treated (FO) groups. SD = standard deviation (shown in parentheses). The “Statistics” section reports standardized mean differences (SMD) and *p*-values from Mann–Whitney U tests. Significance: * $p \leq 0.05$, ** $p \leq 0.01$, *** $p \leq 0.001$.

Table 31: Descriptive statistics for $t - 1$ by treatment group (Pre-Matching)

Variable	Family Offices					Venture Capital					Statistics	
	N	Mean (SD)	Median	Min	Max	N	Mean (SD)	Median	Min	Max	<i>p</i> -value	SMD
Log (total assets)	499	7.12 (2.44)	7.22	1.66	13.6	7603	6.57 (2.63)	6.50	1.66	14.8	< 0.001 ***	0.21
Total Assets	499	21,768 (92,802)	1,371	5.26	793,060	7603	23,104 (118,804)	665	5.26	2,671,924	< 0.001 ***	-0.0114
Growth	343	1.05 (2.09)	0.225	-0.651	9.67	4764	1.33 (2.54)	0.301	-0.732	11.1	0.301	-0.113
ROA	311	-0.286 (0.554)	-0.0833	-2.25	0.491	4783	-0.250 (0.561)	-0.0443	-2.46	0.491	0.0297 *	-0.0631
Leverage	499	1.01 (1.22)	0.714	0.00427	6.48	7574	0.997 (1.19)	0.713	0.00107	6.48	0.588	0.0116
Company age	1081	3.75 (2.82)	3	0	10	18468	3.20 (2.75)	2	0	10	< 0.001 ***	0.201

Notes: Descriptive statistics for covariates at $t - 1$, comparing treated (FO) and control (VC) groups. SD = standard deviation (shown in parentheses). The “Statistics” section reports standardized mean differences (SMD) and *p*-values from Mann–Whitney U tests. Significance: * $p \leq 0.05$, ** $p \leq 0.01$, *** $p \leq 0.001$.

Table 32: Descriptive statistics for $t - 1$ by treatment group (Pre-Matching)

Variable	Family Offices					Private Equity					Statistics	
	N	Mean (SD)	Median	Min	Max	N	Mean (SD)	Median	Min	Max	<i>p</i> -value	SMD
Log (total assets)	265	9.491 (2.140)	9.47	1.66	13.6	2795	9.828 (1.958)	9.78	1.66	14.8	0.0176 *	-0.170
Total Assets	265	73,330 (150,305)	12,921	5.26	793,060	2795	106,396 (296,886)	17,610	5.26	2,671,924	0.0176 *	-0.115
Growth	265	0.246 (1.077)	0.0572	-0.658	9.67	2795	0.185 (0.891)	0.0507	-0.732	9.97	0.724	0.067
ROA	265	-0.051 (0.429)	0.0411	-2.25	0.488	2795	0.011 (0.321)	0.0497	-2.46	0.491	0.0318 *	-0.189
Leverage	265	0.696 (0.674)	0.631	0.00601	6.48	2795	0.653 (0.524)	0.604	0.00222	6.47	0.118	0.079
Company age	265	33.351 (30.018)	20	11	114	2795	36.586 (32.249)	23	11	119	0.171	-0.101

Notes: Descriptive statistics for covariates at $t - 1$, comparing control (PE) and treated (FO) groups. SD = standard deviation (shown in parentheses). The “Statistics” section reports standardized mean differences (SMD) and *p*-values from Mann–Whitney U tests. Significance: * $p \leq 0.05$, ** $p \leq 0.01$, *** $p \leq 0.001$.

Table 33: Descriptive statistics for $t - 1$ by treatment group (Pre-Matching)

Variable	Family offices					Private equity					Statistics	
	N	Mean (SD)	Median	Min	Max	N	Mean (SD)	Median	Min	Max	<i>p</i> -value	SMD
Log (total assets)	392	9.3 (2.09)	9.18	1.66	14.0	4248	9.44 (2.16)	9.42	1.66	14.8	0.0876	-0.062
Total Assets	392	70,422 (162,434)	9704	5.26	1,235,875	4248	94,344 (279,438)	12,392	5.26	2,671,924	0.0876	-0.0881
Growth	327	0.249 (1.01)	0.0725	-0.658	9.67	3490	0.202 (0.929)	0.0522	-0.732	9.97	0.291	0.0501
ROA	317	-0.0384 (0.404)	0.0438	-2.25	0.488	3491	0.00469 (0.33)	0.0479	-2.46	0.491	0.0804	-0.128
Leverage	388	0.676 (0.687)	0.606	0.00601	6.48	4186	0.683 (0.640)	0.602	0.00107	6.48	0.962	-0.0108
Company age	658	43.7 (39.2)	23	11	119	8753	44.4 (38.8)	24	11	119	0.991	-0.0169

Notes: Descriptive statistics for covariates at $t - 1$, comparing control (PE) and treated (FO) groups. SD = standard deviation (shown in parentheses). The “Statistics” section reports standardized mean differences (SMD) and *p*-values from Mann–Whitney U tests. Significance: * $p \leq 0.05$, ** $p \leq 0.01$, *** $p \leq 0.001$.

Table 34: Observation count comparison for FO vs VC and FO vs PE

Panel A: Family Offices vs Venture Capital				
Group	Total N (Incl. Incomplete)	Total N (Complete Only)	Lost Obs	% Lost
Family Offices (FO)	1081	219	862	79.7%
Venture Capital (VC)	18468	3024	15444	83.6%
Panel B: Family Offices vs Private Equity				
Family Offices (FO)	658	265	393	59.7%
Private Equity (PE)	8753	2795	5958	68.1%

Notes: This table compares the number of total observations (including incomplete data) versus complete-case observations used for descriptive statistics in the Family Office (FO) vs Venture Capital (VC) and FO vs Private Equity (PE) analyses. “% Lost” indicates the proportion of observations excluded due to missing data when moving to complete-case analysis.

Table 35: Correlation matrix of key variables at $t - 1$ (Pre-Matching)

Variable	Log (total assets)	Growth	ROA	Leverage	Company age
Log (total assets)	1.000	-0.257	0.335	-0.200	0.396
Growth		1.000	-0.042	-0.038	-0.209
ROA			1.000	-0.533	0.168
Leverage				1.000	-0.085
Company age					1.000

Note: This matrix shows Pearson correlations between log-transformed total assets, growth, return on assets (ROA), leverage, and company age, measured one year prior to treatment. Values below the diagonal are omitted for clarity due to symmetry.

Table 36: Fixed-effects ANCOVA results for FO vs VC

Dependent Variable	Term	df	F-statistic	p-value
Log (total assets)	treatment	1	329	<0.001***
	country	35	36.1	<0.001***
	sector	28	30.5	<0.001***
	year	9	6.03	<0.001***
Growth (t-1)	treatment	1	45.1	<0.001***
	country	34	4.52	<0.001***
	sector	27	2.81	<0.001***
	year	9	3.60	<0.001***
ROA (t-1)	treatment	1	13.8	<0.001***
	country	35	3.84	<0.001***
	sector	27	8.07	<0.001***
	year	9	3.33	<0.001***
Leverage (t-1)	treatment	1	9.84	0.002**
	country	35	13.0	<0.001***
	sector	28	2.40	<0.001***
	year	9	1.05	0.399

Notes: This table presents fixed-effects ANCOVA results for the FO vs VC comparison. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

Table 37: Fixed-effects ANCOVA results for FO vs PE

Dependent Variable	Term	df	F-statistic	p-value
Log (total assets)	treatment	1	330	<0.001 ***
	country	39	18.2	<0.001 ***
	sector	27	15.8	<0.001 ***
	year	9	4.03	<0.001 ***
Growth (t-1)	treatment	1	99.9	<0.001 ***
	country	35	2.33	<0.001 ***
	sector	27	2.16	<0.001 ***
	year	9	3.48	<0.001 ***
ROA (t-1)	treatment	1	129	<0.001 ***
	country	39	5.50	<0.001 ***
	sector	27	5.65	<0.001 ***
	year	9	2.94	0.002 **
Leverage (t-1)	treatment	1	49.4	<0.001 ***
	country	38	3.94	<0.001 ***
	sector	27	1.31	0.128
	year	9	1.32	0.222

Table 38: Descriptive statistics for $t - 1$ by treatment group (Post-Matching)

Variable	N	Family Offices				N	Venture Capital				Statistics	
		Mean (SD)	Median	Min	Max		Mean (SD)	Median	Min	Max	p -value	SMD
Log (total assets)	72	7.702 (2.003)	7.80	3.41	13.5	129	7.484 (2.415)	7.16	2.12	13.5	0.369	0.096
Growth	72	0.970 (1.820)	0.252	-0.590	9.67	129	1.610 (2.766)	0.434	-0.690	9.67	0.227	-0.259
ROA	72	-0.121 (0.279)	-0.0494	-1.20	0.451	129	-0.143 (0.399)	-0.0213	-2.16	0.491	0.676	0.060
Leverage	72	0.671 (0.537)	0.612	0.00649	4.37	129	0.700 (0.667)	0.601	0.00649	5.25	0.999	-0.047
Company age	72	5.097 (2.209)	5	2	10	129	4.736 (2.090)	4	2	10	0.289	0.169

Notes: Descriptive statistics for covariates at $t - 1$, comparing treated (FO) and control (VC) groups (post-matching). SD = standard deviation (shown in parentheses). The “Statistics” section reports standardized mean differences (SMD) and p -values from Mann-Whitney U tests. Significance: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 39: Descriptive statistics for $t - 1$ by treatment group (Post-Matching)

Variable	N	Family Offices				N	Private Equity				Statistics	
		Mean (SD)	Median	Min	Max		Mean (SD)	Median	Min	Max	p -value	SMD
Log (total assets)	87	9.807 (1.859)	9.66	2.36	13.5	164	10.193 (1.640)	10.1	4.67	13.5	0.0809	-0.224
Growth	87	0.171 (0.567)	0.0636	-0.658	4.50	164	0.203 (0.754)	0.0934	-0.681	9.08	0.219	-0.046
ROA	87	0.046 (0.141)	0.0493	-0.652	0.418	164	0.071 (0.112)	0.0666	-0.222	0.491	0.18	-0.205
Leverage	87	0.655 (0.653)	0.596	0.0284	6.24	164	0.623 (0.302)	0.612	0.00649	2.02	0.906	0.069
Company age	87	30.149 (24.473)	22	11	114	164	29.848 (24.189)	21	11	119	0.668	0.012

Notes: Descriptive statistics for covariates at $t - 1$, comparing treated (FO) and control (PE) groups (post-matching). SD = standard deviation (shown in parentheses). The “Statistics” section reports standardized mean differences (SMD) and p -values from Mann-Whitney U tests. Significance: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.