

Spreading Sunshine in Private Equity: Financial Intermediation and Regulatory Oversight*

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Abstract

This paper studies the impact of regulatory oversight on market transparency and financial intermediation in private equity (PE) markets. I use regulatory filings to examine an unanticipated reform that substantially expanded the regulatory oversight of PE fund advisers reducing information frictions for institutional investors. The enhanced regulatory oversight increases investors' PE market participation while reducing their incentives to bypass PE fund intermediation. Investors' direct investments tend to target larger, more mature, and less innovative companies relative to investments made through PE funds. These findings highlight the limits of market discipline and demonstrate the positive role of regulatory oversight in improving intermediation in PE markets.

Keywords: Financial Regulation, Transparency, Governance, Private Equity, Market Organization, Institutional Investors, Dodd-Frank Act

JEL Classification: G23, G24, G28, K22, L22, L51

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1 Introduction

There has been a long-standing debate on the benefits of regulation for financial markets, since market forces can potentially discipline conflicts of interest (e.g. Coase, 1960; Stigler, 1971; Posner, 1974; Stiglitz, 1993; Shleifer, 2005; Zingales, 2009).¹ A fundamental source of conflicts in intermediation is that investors are less informed about the investments than the delegated manager who manages them. Such information friction is particularly prevalent in private equity (PE) markets, featured by limited disclosure and a lack of market pricing. The opaqueness of PE funds has gained growing attention from regulators and investors including pension funds, endowments, and insurers, collectively known as limited partners (LPs), as private equity takes an increasing share of investors’ portfolios.² On the one hand, PE fund advisers, or general partners (GPs), are mainly incentivized by compensation contracts to select, monitor, and exit private companies on behalf of LPs, who are in principle sophisticated institutional investors capable of enforcing market discipline (Gompers and Lerner, 1999; Metrick and Yasuda, 2010; Robinson and Sensoy, 2013). On the other hand, PE fees collected by GPs are often perceived as outsized, potentially reflecting inherent agency conflicts in this delegation especially when these fees are difficult for investors to assess (Edmans, Gabaix, and Jenter, 2017). Due to information frictions in LP-GP relationships, market discipline may fail to sufficiently align incentives, making intermediation excessively costly for LPs despite its large benefits for the broader economy.

This paper studies whether regulatory oversight can complement market discipline to improve incentive alignment and facilitate financial intermediation in opaque markets—an under-explored topic in the PE context. This market offers an ideal setting due to the potential scope for conflicts of interest and an unique exogenous regulatory shift that significantly

¹Market imperfections such as information asymmetry, market power, and externalities may result in weak market discipline, creating a potential role for regulation (Stiglitz, 1993; Shleifer, 2005; Zingales, 2009). Conversely, regulators are not inherently better informed than investors and face their own incentive problems; furthermore, the political process of regulation is prone to capture by the industry it is meant to oversee (Coase, 1960; Stigler, 1971; Posner, 1974). As a result, regulation risks being ineffective and even costly for investors.

²See, for example, “Private equity’s opaque costs mystify the pensions that pay them”, *Bloomberg*, March 2022 and “Investment industry welcomes SEC efforts to reform private equity fees”, *Financial Times*, February 2022. LPs’ efforts to reduce high PE fees have often been considered an important contributing factor to the disintermediation of PE markets shown in Figure 1 (Fang, Ivashina, and Lerner, 2015; Braun, Jenkinson, and Schemmerl, 2020; Lerner, Mao, Schoar, and Zhang, 2022).

expanded the oversight of PE funds. Historically, most PE fund advisers in the US faced little regulatory scrutiny, since they could avoid SEC registrations under an exemption provided by the Investment Advisers Act of 1940. This exemption applied to advisers with fewer than 15 clients, counting each fund as a single client regardless of the number of investors within a fund (SEC, 2011b). However, the Dodd-Frank Act *unexpectedly* eliminated this exemption in 2012, introducing substantially narrower exemptions based primarily on advisers' size and investment strategies rather than on potential agency conflicts (see Section 2.2). These changes reflect regulators' concerns about systemic risks in private funds following the 2008 financial crisis, which originated outside the PE industry. Consequently, many advisers including large GPs were required to register for the first time, becoming subject to examinations, rules, and disclosure.

I motivate my empirical design by presenting new stylized facts about the regulatory oversight of PE funds. First, the Dodd-Frank Act led to a *sharp* and *permanent rise* in registrations clustered around the compliance deadline, with the share of registered advisers rising from around 25% pre-reform to nearly 50% when the intervention became effective. Second, the reform contributed to a persistent increase in public disclosure by registered advisers through Form ADV filings, routinely submitted to the SEC to report detailed information on their operations, disciplinary histories, and other relevant aspects. Third, despite these changes, there are rather limited aggregate changes in PE fund characteristics post-reform based on regulatory filings and fundraising data, implying that advisers do not systematically adjust their investments to meet the new registration exemptions. Lastly, registered GPs are more likely to receive regulatory actions due to greater scrutiny. Overall, with strong enforcement, the reform substantially expanded the regulatory oversight within the PE fund sector enhancing market transparency and limiting GPs' opportunistic behaviors.

Since both the timing and exemption of the reform were largely unanticipated by LPs and GPs, I use the intervention as a quasi-natural shock to assess how regulatory oversight of PE funds affects LPs' PE market participation. To establish the casual relationship, I first document that LP-GP relationships are sticky. Therefore, LPs are arguably more exposed to the regulatory shock if they have more *pre-existing* relationships with GPs that became *newly registered* due to the Dodd-Frank Act. To identify these GPs in Preqin, I

manually match the data with Form ADV by searching the Investment Adviser Public Disclosure database based on GP names. The novel use of Form ADV allows me to accurately track the SEC registration status of each GP over time (see Figure C.1). Moreover, I show that the cross-sectional variation of LPs’ shock exposure cannot be explained by LP institutional types or headquarter states known to influence LP-GP matching (Lerner, Schoar, and Wongsunwai, 2007; Hochberg and Rauh, 2013), mitigating potential concerns of selection into newly registered GPs.³ Using a difference-in-differences (DiD) design that exploits within-LP variation, I compare investment behaviors between LPs with a high versus low share of newly registered GPs in their pre-existing relationships, before and after the shock.

I find that regulatory oversight of PE funds increases investors’ market participation and reduces their incentives to bypass intermediation, implying that market forces alone do not fully discipline PE funds’ conflict of interest. The DiD estimates indicate a 28% increase in the probability of committing capital to PE funds and a 35% decrease in the probability of making direct investments among LPs with high exposure to newly registered GPs. In direct investments, LPs bypass PE funds and directly purchase shares of private companies thus avoiding agency costs in outsourced relationships (see Figure 1). The dollar amount of increased capital commitments outweighs the decreased direct investments, leading to a net increase in capital supply to PE markets. Moreover, there are no differential trends in the years leading up to the reform, but a persistent difference emerges in outcome variables across LPs with different exposure to the regulatory intervention.

GPs’ disciplinary histories, as disclosed in Form ADV, provide a direct link between my results and the agency costs of financial intermediation. LPs arguably respond more strongly to regulatory oversight of PE funds when their GPs are more prone to agency conflicts. Meanwhile, regulatory oversight would be more beneficial when geographic distance makes it difficult for LPs to monitor and acquire information about their GPs. These predictions are supported by a triple-difference analysis that exploits cross-sectional variation in LPs’ exposure to GPs with prior misconduct and geographical distance to pre-existing GPs. Notably, the impact of regulatory oversight is concentrated among LPs connected to

³Section C.2 further demonstrates that key pre-intervention characteristics of public pensions, such as size, financial health, investment assumptions, type, investment returns and asset allocation, do not correlate with a pension’s probability of having high exposure to newly registered GPs in its pre-existing relationships.

GPs with prior misconduct and LPs that are farther away from their GPs, as these GPs' incentives tend to diverge from their LPs' interests.

I consider and rule out several alternative mechanisms for my findings. First, the new registration exemptions are tied to GP size and investment strategy, raising concerns that the effects might stem from differences in investment opportunities and market dynamics between small and large GPs, or between GPs managing different types of funds. To address this concern, I re-estimate my baseline regressions, allowing LP outcomes to evolve on flexible time trends based on LPs' exposure to these GPs in their pre-existing relationships, and find similar findings. Moreover, within-GP estimation further mitigates this concern by suggesting that GPs with different sizes or investment strategies do not experience differential dynamics in their fundraising outcomes before and after the intervention. Second, the Dodd-Frank Act introduced contemporaneous regulatory interventions, including the Volcker Rule which limits banks from investing in private equity ([Chen and Ewens, 2024](#)). To address these potential confounders, I re-estimate the DiD design using different subsample of LPs and controlling for year-by-LP-type fixed effects, which take into account systematic differences across different LPs. The results remain qualitatively similar, supporting the robustness of my findings. Third, I reject other alternative explanations—including changes in the supply of PE funds, shifts in co-investments, and reporting bias—which are detailed in Section 5.3.

My findings underscore the need for regulatory interventions to mitigate information asymmetries and align incentives between GPs and LPs in PE markets. Financial markets are prone to market failures because information is a public good, creating a free-rider problem—market participants have insufficient incentive to produce or disclose information since they cannot fully capture the benefits ([Stiglitz, 1993](#)). In PE markets, this results in limited transparency: GPs may withhold details on investment strategies, portfolio performance, and fees, while LPs may lack the resources or incentives to verify this information. Moreover, PE investments are specialized, opaque, and exempt from public disclosure. GPs possess detailed knowledge of portfolio companies, while LPs depend on GPs for information, limiting LPs' ability to make informed decisions regarding contracting, monitoring, and other forms of market discipline. Regulatory interventions, such as mandatory disclosure, operational rules and periodic examinations, can help bridge this gap by enhancing transparency.

Lastly, I present evidence that regulatory oversight of PE funds could address potential capital allocation inefficiencies associated with disintermediation. Financing private companies is challenging due to information asymmetry and risk, which impose significant costs on investors. Unlike specialized GPs, LPs often lack the expertise to evaluate private companies and the diversification provided by PE funds which pool capital for PE investments. I show that LPs disproportionately finance more mature and larger companies in their direct investments than their GPs do. Moreover, these companies have less patenting intensity measured by the number of highly cited patent applications scaled by PE deal size. While this investment choice can be privately optimal for LPs, disintermediation might be socially suboptimal because of potential underinvestment in younger and more innovative companies.

Overall, this paper highlights the limits of market discipline of PE funds and suggests that enhanced regulatory oversight can increase capital supply and shape the organizational structure of PE markets. Despite these benefits, it is important to acknowledge that regulatory intervention inevitably introduces ongoing compliance and disclosure costs for PE fund advisers, most of which will be passed on to investors, while potentially distorting fundraising and imposing opportunity costs on the SEC due to its limited resources ([Charoenwong, Kwan, and Umar, 2019](#)). Therefore, the paper’s findings can inform active debates about the optimal level of regulation for PE funds, which has important implications for various institutional investors, their beneficiaries, and the broader economy, particularly as PE funds become increasingly accessible to retail investors.⁴

Related Literature. Although financial intermediation offers various advantages such as lower transaction costs and greater risk diversification (e.g., [Benston and Smith, 1976](#); [Leland and Pyle, 1977](#); [Chan, 1983](#)), it introduces delegation costs arising from incentive problems between intermediaries and investors. When there are many investors, duplicated monitoring costs and free-riding problems can make financial intermediation excessively costly or even unfeasible. Such incentive problems are first recognized and addressed in the banking literature by [Diamond \(1984\)](#) through diversification and committed debt-like payments to

⁴In the global context, regulatory frameworks for opaque asset classes—such as the EU’s Alternative Investment Fund Managers Directive (AIFMD) or Asia’s evolving PE oversight regimes (e.g., PE fund adviser registration with the Asset Management Association of China (AMAC))—face similar trade-offs between investor protection and compliance costs.

investors. In contrast, PE funds have limited portfolio diversification and issue equity-like securities to investors, and existing studies have exclusively focused on incentive contracting between LPs and GPs in addressing agency problems in PE funds (Gompers and Lerner, 1996, 1999; Metrick and Yasuda, 2010; Robinson and Sensoy, 2013; Chung, Sensoy, Stern, and Weisbach, 2012). My findings highlight the limits of market discipline due to inherent information frictions in LP-GP relationships and support the role of regulatory oversight in aligning incentives, a topic that has received limited exploration. In a related paper, Jiang, Mason, Qian, and Utke (2024) studies the impact of mandatory misconduct disclosure on GPs' fundraising. My paper differs by directly examining LPs' PE market participation in response to an arguably exogenous expansion in regulatory oversight of PE funds.

This paper also closely relates to the literature on the regulation of financial intermediaries. Besides the extensive research on bank regulation and supervision (e.g., Laeven and Levine, 2009; Berger and Bouwman, 2013; Buchak, Matvos, Piskorski, and Seru, 2018), a small but growing body of work examines the implications of regulations for non-bank financial intermediaries such as investment advisers, hedge funds, pension funds, and insurance companies (Charoenwong, Kwan, and Umar, 2019; Garrett, 2024; Dimmock and Gerken, 2016; Andonov, Bauer, and Cremers, 2017; Sen, 2023). While historically facing little regulation, PE markets have recently been attracting intensified regulatory scrutiny due to their rapid growth and opaqueness. As a landmark legislative change, the Dodd-Frank Act significantly expanded the regulatory oversight of PE funds. To my knowledge, this paper is the first to empirically characterize this intervention and estimate its causal effects on the PE market, adding to the emerging literature on economic impacts of PE regulations (Ewens and Farre-Mensa, 2020; Abuzov, Gornall, and Strebulaev, 2025; Bian, Li, and Nigro, 2025; Howell, Parker, and Xu, 2025). Methodologically, my paper contributes by introducing an arguably exogenous shock to agency frictions faced by GPs, resulting from changes in their SEC registration status, which can be constructed from publicly available Form ADV filings.

At last, my work is complementary to the literature on firm boundaries. Since Coase (1937), existing literature has emphasized that firms are organized to overcome holdup costs in relationship-specific investments (Klein, Crawford, and Alchian, 1978; Williamson, 1979; Grossman and Hart, 1986; Hart and Moore, 1990). Different from the considerable empirical

work that supports such capital-allocation perspective (e.g., Lafontaine and Slade, 2007; Frésard, Hoberg, and Phillips, 2020; Bena, Erel, Wang, and Weisbach, 2023), this study shows that institutional investors are less likely to organize PE investment activities within their own firm boundaries when regulatory oversight mitigate agency costs in outsourced relationships. This finding is established within the setting of PE investing, characterized by low asset specificity and weak holdup problems due to its human-capital intensive nature (Ewens and Rhodes-Kropf, 2015). Therefore, my paper provides novel evidence consistent with the under-explored incentive view that firm boundaries respond to agency frictions - when it is difficult to extract outputs from an outsourced relationship, firms tend to organize the relationship within themselves, which improves monitoring and provides a wider range of incentive tools (Holmstrom and Milgrom, 1991, 1994; Holmstrom, 1999). The findings also imply that regulation can indirectly shape the organizational structure of financial markets through incentive alignment.

2 Institutional Details

2.1 Market Discipline of PE Funds and Its Limits

While various forms of market discipline, discussed below, act as the first line of defense in mitigating conflicts of interest faced by GPs, these market forces may fail to sufficiently align incentives due to pervasive information frictions in PE markets featured with limited disclosure and market frictions such as market power, illiquidity and a lack of market pricing.

Compensation Contracts. LPs mainly rely on compensation contracts outlined in the Limited Partnership Agreements (“LPAs”) at fund inception to incentivize GPs (Gompers and Lerner, 1996, 1999; Metrick and Yasuda, 2010; Robinson and Sensoy, 2013). Key components of the compensation include management fees and carried interest. Management fees are not based on fund performance and provide GPs with fixed annual revenue calculated as 1.5%-2.5% of the fee basis, which often shifts from committed capital to net invested capital calculated as invested capital minus the cost basis of any exited investments. Carried interest, a performance-based component, typically rewards GPs with 20% of profits after LPs achieve a pre-specified hurdle rate of return, often set at 8%.⁵ Due to information and

⁵This contract usually includes a catch-up provision allowing GPs to receive 100% of net exit returns until they secure 20% of all annualized profits after they reach the hurdle rate.

search frictions in PE markets, both LPs and GPs have some pricing power (Lerner and Schoar, 2004; Hochberg, Ljungqvist, and Vissing-Jørgensen, 2014). As a result, the level and structure of pay are to some extent decided by GPs potentially to maximize their rent extraction.⁶ Empirically, the amount of fixed payments tends to increase during fundraising booms, which favors GPs and could misalign their incentives with LPs’ (Robinson and Sensoy, 2013; Lerner and Nanda, 2020). Compounded by GPs’ limited disclosure, the intricate nature of PE fee structures makes it challenging for LPs to accurately assess and monitor their fees, creating potential scope for rent extraction and inefficient contracting (Phalippou, 2009; Zingales, 2009).⁷

Indirect Pay for Performance. Besides direct compensation paid by existing LPs, GPs are also incentivized through future fundraising tied to their previous performance (Chung, Sensoy, Stern, and Weisbach, 2012). However, unlike public-traded stocks that have market prices, the underlying assets of PE funds usually rely on quarterly interim valuations provided by GPs. These valuations are stale prices by nature and usually do not reflect the most recent information. Therefore, the lack of mark-to-market valuations could lead to insufficient market discipline and inefficient capital allocation across fund managers. Moreover, if inflated to window-dress performance during fundraising, interim fund valuations can potentially mislead investors and exacerbate these problems (Barber and Yasuda, 2017; Chakraborty and Ewens, 2018; Brown, Gredil, and Kaplan, 2019).

Ex-Post Monitoring. While LPs could incentivize GPs through ex-post monitoring, it is often excessively costly due to GPs’ limited disclosure and LPs’ coordination frictions. Such incentive cost in intermediation is discussed by Diamond (1984). Moreover, LPs can influence GPs by expressing concerns through their advisory committee seats if GPs are

⁶In contrast, the shareholder/investor value maximization view in the compensation literature typically assumes that the contract is decided solely by shareholders/investors or their well-incentivized representatives (Edmans, Gabaix, and Jenter, 2017).

⁷Bebchuk and Fried (2003, 2004) suggest that managerial compensation can be a part of the principal-agent problem itself and partially set by managers to maximize their rent extraction through various hidden compensation and pay for non-performance (e.g., Yermack, 2006; Harford and Li, 2007; Stefanescu, Wang, Xie, and Yang, 2018). See Edmans, Gabaix, and Jenter (2017) for a survey of the rent extraction view. Although enhanced transparency benefits all market participants and thus has positive externalities, each investor only partially benefits from greater disclosure and tends to use their bargaining power to extract other concessions from PE funds, resulting in a suboptimal level of disclosure (Zingales, 2009). Begenu and Siriwardane (2024) documents fee dispersion across LPs in the same PE fund due to LP-GP bargaining.

making poor investments. However, such action remains weak compared to the influence of the board of directors who can affect corporate decisions through voting. In fact, LPs will lose limited liability if they directly interfere in the day-to-day operations of the fund. Meanwhile, the closed-end design and illiquidity of PE funds restrict LPs’ ability to exit current funds, making it difficult for LPs to vote with their feet like investors in public companies or mutual funds.

2.2 Regulatory Oversight of PE Funds and the Dodd-Frank Act

Various features of PE markets discussed above indicate that market discipline may be insufficient, suggesting that policy intervention could play a role. However, most PE fund advisers historically received little regulatory oversight in the US because of their exemption from registration with the SEC under the Investment Advisers Act of 1940. The exemption applied to advisers with fewer than 15 clients, considering each fund a single client instead of counting individual investors within the funds under management (SEC, 2011b). One rationale is that PE funds primarily targeted institutional and accredited investors, who were often considered sophisticated enough to conduct their own due diligence. In 2012, Title IV of the Dodd-Frank Act eliminated this exemption and introduced significantly narrower registration exemptions for advisers solely to private funds with less than \$150 million in assets under management (the “private fund adviser exemption”)⁸ and those that exclusively advise venture capital (VC) funds that meet the SEC’s regulatory definition (the “venture capital exemption”).⁹ Consequently, many previously unregistered PE fund advisers (also known as exempt reporting advisers), including some large GPs, had to register with the SEC for the *first time* (see Section 4.1).¹⁰

As an important part of the Dodd-Frank Act’s overhaul of financial systems after the

⁸The SEC considers affiliated entities as a single adviser to avoid situations where an adviser with over \$150 million AUM splits itself into multiple smaller entities, each attempting to qualify for the private fund exemption (SEC, 2011a).

⁹The Dodd-Frank Act amendment was adopted by the SEC on June 22, 2011, with transition provisions that required advisers to be registered by March 30, 2012. Figure 3 shows that most advisers waited until the compliance deadline to register with the SEC, implying that advisers find registration costly. The term private fund generally includes hedge funds, PE funds, and other funds such as real estate funds and securitized asset funds. Besides the private fund adviser and venture capital exemptions, certain foreign advisers without a place of business in the US are also exempt from registrations.

¹⁰Table C.1 provides a list of the top 20 newly registered PE fund advisers in 2012 based on the total gross asset value of their PE funds as reported in their 2012 Form ADV filings.

2008 financial crisis, which stemmed outside of the PE sector, these new registration exemptions reflect Congress’ concern regarding the potential systemic risks in private funds, especially hedge funds. While the Senate voted to exempt PE fund advisers in 2010, the final enacted version of the Dodd-Frank Act *does not* exclude PE funds from registration and is primarily based on fund managers’ size, underlying investments, and use of leverage.¹¹ For instance, the venture capital exemption is motivated by two major policy rationales. First, VC funds invest in non-public start-ups, which are not directly connected to the public market and thus pose relatively little systemic risk to the entire financial system or retail investors. Second, VC funds use limited leverage, implying that potential losses are mainly borne by LP investors and will not propagate throughout financial markets through the credit channel or other counterparty relationships.¹² Appendix A discusses the venture capital exemption and the heated debate over the regulatory definition of a VC fund in more detail as an illustrative example of Congress’ trade-offs between systemic risk monitoring and regulatory costs in setting the new registration exemptions.

After becoming registered with the SEC, PE fund advisers will be subject to regulatory oversight including periodic examinations, operational restrictions, as well as mandatory disclosure such as Form ADV filings and other related Schedules. These publicly available regulatory filings require registered advisers to disclose information including business practices, ownership, clients, conflicts of interest, and disciplinary information.¹³

2.3 SEC’s Examinations of Registered PE Funds

After the Dodd-Frank Act eliminated many PE fund advisers’ registration exemptions, the SEC started its first systematic examination of these never-examined advisers to assess risks and operational issues in this market. Soon afterward, the examinations revealed widespread deficiencies, most of which are related to PE fees. In the first announcement of exam observations in mid-2014, the SEC pointed out that:

¹¹The SEC’s Proposing Release of new registration exemption rules to private funds. Release No. IA-3111; File No. S7-37-10

¹²In fact, many VC fund advisers still have to register with the SEC because their funds do not meet the SEC’s narrow definition of VC funds based on many characteristics such as the size of non-qualifying investments basket and limits on the use of credit. See Appendix A for more detail.

¹³Besides Form ADV, registered PE fund advisers need to submit Form PF, a type of confidential filings that require detailed information about their private funds’ activities and performance. However, LPs and the public do not have access to the details reported in Form PF.

*“By far, the most common observation our examiners have made when examining PE firms has to do with the adviser’s collection of fees and allocation of expenses. When we have examined how fees and expenses are handled by advisers to PE funds, we have identified what we believe are violations of law or material weaknesses in controls over 50% of the time.”*¹⁴

The announcement highlighted three major types of misconduct including misallocated expenses, hidden fees, and manipulated valuation of portfolio companies. Conceptually, if these payments were simply another form of compensation aligned with investor value maximization, it is unclear why they would be extracted in such *opaque forms*. Moreover, the SEC noted that the deterioration of PE returns exacerbates these agency problems because fewer GPs can achieve their preferred return through carried interest - creating incentives to shift expenses and collect hidden fees.

Given the typical 10-year lifespan of a PE fund, unforeseen contingencies often arise, making the compensation contracts inherently incomplete. These agreements often feature broad wording, permitting GPs *a wide latitude of flexibility* that might enable them to charge fees and pass along expenses beyond what LPs might reasonably contemplate, further complicating the transparency issues highlighted by the SEC.

The noncompliance also partially results from LPs’ limited oversight *after* fund investments despite their extensive due diligence *before* capital commitments, as observed by the SEC. It highlights two main reasons for this observation. First, PE funds typically have a large number of LPs, often making it difficult for individual LPs to coordinate or even identify each other, which creates free-rider problems and coordination failure among LPs when monitoring GPs. Second, investors may not be sufficiently staffed to monitor GPs.¹⁵

Agency conflicts in PE fees are both widespread and persistent. Since the Dodd-Frank Act became effective, the SEC has been revealing various adviser deficiencies found in its examinations. In its recent alert in 2022, the SEC discovered operational issues such as miscalculating post-commitment period management fees, extending fund lives and recycling

¹⁴Spreading Sunshine in Private Equity, Andrew J. Bowden, May 2014

¹⁵For survey evidence, see [Da Rin and Phalippou \(2017\)](#). The 25th (75th) percentile value of LPs’ private equity team size is 1(5) professional(s), with a mean value of 6.4.. The authors examined the team specialization of institutional investors with allocation to private equity, as well as their accounting, legal, investment, and monitoring activities at the fund and portfolio company level.

realized investment proceeds to charge extra management fees without sufficient disclosure to investors.¹⁶ Overall, the cost to PE fund investors may be far greater than the direct cost of hidden fees. If the managerial contract provides insufficient incentives to exert effort or induces inefficient investment decisions, investor losses could be much greater.

Conscious of the agency conflicts found in PE funds, the SEC recently introduced a sweeping reform on PE fees. Among other things, the proposed rules include quarterly statements on detailed fees, new requirements on fund audits and bookkeeping, as well as a ban from charging certain fees and expenses.¹⁷ While bringing more transparency to fees, most of these changes are *only limited to registered fund advisers*. Moreover, GPs and other interest groups sued the SEC for regulatory overreach, and some of the SEC’s oversight rules were stuck down by the US court in 2024.¹⁸

3 Data and Variables

3.1 Data Sources

Preqin. My main analysis samples consist of the universe of private equity LPs and GPs covered by Preqin. Besides data on PE deals, Preqin provides detailed fund-level information such as the list of LP investors and their committed capital, which allows me to observe LP-GP relationships in PE markets. Moreover, each financial institution is assigned a unique identifier. This identifier can be used to link fund investors and PE deal investors, including GPs and LPs, in Preqin’s other datasets. As a result, I can accurately match LP investors with their corresponding fund investments and direct investments in private companies.

Form ADV Filings. Form ADV filings are legally required disclosure made by investment advisers including PE fund advisers. Fund advisers need to indicate their registration status when they submit their filings. Unlike registered advisers, exempt reporting advisers are only required to complete certain sections in the Form ADV. All advisers must keep their forms updated by filing periodic amendments and will face penalties such as revocation of registration and criminal prosecution if there are any false statements or omissions. Moreover, both registered and unregistered advisers need to disclose all their disciplinary events in at

¹⁶Observations from Examinations of Private Fund Advisers, Division of the Examinations, January 2022

¹⁷See “SEC Enhances the Regulation of Private Fund Advisers”, August 2023

¹⁸See, for example, “US appeals court strikes down SEC private equity, hedge fund oversight rule”, Reuters, June 2024.

least the past ten years and complete the corresponding schedules, Disclosure Reporting Pages (“DRPs”), which include details related to each event such as principal sanctions, initiation date, and status.

Form ADV-W Filings. Form ADV-W is the formal document for withdrawing an investment adviser’s registration with the SEC or state securities authorities. Advisers may file this form when they transitioning to exempt reporting adviser status under registration exemptions. I use Form ADV-W to document limited withdrawal by registered advisers.

Investment Adviser Public Disclosure (IAPD). I manually search Preqin GP names on the IAPD website and create a linking table between PE fund advisers in Preqin and Form ADV filings. The database contains information about investment adviser firms regulated by the SEC and state securities regulators in the US. Users can search for an investment adviser firm on this site and access the Form ADV submitted by the adviser, which includes details such as the adviser’s name, SEC file number, and office addresses.

Public Plans Data (PPD). It provides comprehensive yearly information on over 250 major state and local pension funds across the US. I use the PPD data to assess potential selection into newly registered GPs among the public pensions in my LP sample. See Appendix C.2 for more detail.

PatentsView. I complement my analysis with PatentsView, a platform supported by the United States Patent and Trademark Office (USPTO). PatentsView provides comprehensive data such as the assignee name, application year, grant year, and citations of published patent applications filed after 2001. The patent data allows me to assess the level of innovation in private companies funded through LP direct investment versus those funded through fund investment.

SDC Platinum. To investigate whether LPs are adversely selected into worse companies in their direct investments, I augment the Preqin PE exit database with the SDC Platinum to construct outcome variables related to IPOs and acquisitions.

3.2 Measuring LPs’ Exposure to the Regulatory Shock

The Dodd-Frank Act expanded the regulatory oversight of PE markets by eliminating registration exemptions for many unregistered PE fund advisers. Newly registered advisers become subject to examinations, rules, and mandatory disclosure, plausibly facing lower

agency conflicts after registration. My measure of LPs’ differential exposure to this regulatory shock is based on the share of GPs that became *newly registered* due to the Dodd-Frank Act within LPs’ *pre-existing* LP-GP relationships.¹⁹ Importantly, while Preqin may miss some high performing funds’ cash flow information (Kaplan and Lerner, 2016), this limitation does not affect the coverage of LP lists for these funds.²⁰

This measure can be constructed based on changes in GPs’ registration status indicated in their Form ADV filings. To compile this dataset, I first create a list of unique GP names in LPs’ pre-existing relationships covered in Preqin. Then, I manually match the dataset with Form ADV filings by searching GP names in the IAPD web-based database. This approach creates a linking table between Preqin GP identifiers and their SEC file numbers in Form ADV. Appendix B.2 provides details of the matching procedure. The novel use of Form ADV filings allows me to track the SEC registration status of each GP over time. Figure C.1 shows that the share of newly registered GP in the matched Preqin-ADV dataset closely aligns with the share solely based on Form ADV filings (correlation = 0.98), confirming the accurate identification of GPs’ registration status in Preqin.

3.3 Summary Statistics

My main sample includes all US institutional investors that have at least one LP-GP relationship before 2012, the effective year of the Dodd-Frank Act.²¹ My sample includes 1,522 unique LPs. To complement my analysis, I also use a sample of 1,188 unique US GPs invested by the sample LPs.

Table 1 shows the summary statistics of the main variables used in my analysis. In Panel A, a unit of observation is a GP-year spanning from 2001-2021. The variables include a rich set of regulatory actions GPs might receive in a given year. The probability of receiving any regulatory action is around 1.08% each year. For Panel B, a unit of observation is an LP-year during 2001-2021. On average, the probability of LPs committing capital to any PE funds is 34% each year and the probability of making direct investments in private companies is

¹⁹Sections 5.1.2 and 5.1.3 discuss the identification assumptions behind this measure in detail.

²⁰For instance, while Preqin lacks cash flow data for funds managed by Sequoia Capital, LPs for many of Sequoia’s funds remain observable in the database. In fact, more than 70% of PE funds have LP information.

²¹I drop 81 PE firms - some established PE firms such as Sequoia Capital, Kleiner Perkins, Accel, and New Enterprise Associates are also LPs that contribute capital to funds managed by other PE firms. Otherwise, all their PE investments would be implausibly classified as direct investments.

4%. The average amount of committed capital is \$39.41 million per year and \$ 1.61 million for direct investments. In Panel C, the sample consists of financing rounds raised by private companies between 2001 and 2021 in the US, covering both VC and buyout deals. This sample is used to evaluate the potential capital allocation implications of disintermediation in PE markets. Approximately 42% of the deals are early-stage, defined as a VC deal with a round number below Series C, and the average LP ratio is 1.62% in the sample deals.

4 Stylized Facts of PE Fund Regulatory Oversight

In this section, I motivate the identification design discussed in Section 5.1 by presenting stylized facts about regulatory oversight of PE funds before and after the Dodd-Frank Act.

4.1 Expanded Regulatory Oversight

Several patterns from the Form ADV filings suggest that many advisers had to register with the SEC due to strong enforcement of the Dodd-Frank Act. Registered advisers are subject to examinations, rules, and mandatory disclosure. Conceptually, such regulatory oversight reduces the information asymmetry faced by fund investors:

Sharp and Permanent Rise in Registrations. The Dodd-Frank Act eliminated registration exemptions for many previously unregistered PE fund advisers. Figure 2a shows this triggered an immediate and substantial increase in registrations during the reform’s implementation year, with the share of registered PE fund advisers jumping from 28% in 2011 to 48% in 2012.²² The sharp discontinuity in registrations at the intervention year suggests that the regulatory change induced *exogenous* variation in registration status, as advisers had limited ability to strategically change their fund characteristics to qualify for the new exemptions.²³ This increase indicates the Act successfully addressed a major regulatory gap by subjecting previously exempt advisers to SEC oversight. The persistence of elevated registration levels in subsequent years further demonstrates the reform’s lasting impact.²⁴

²²Unregistered PE fund advisers did not have to submit Form ADV filings until the Dodd-Frank Act became effective in 2012. Therefore, only the number of registered advisers is observable before 2012 and the total number of advisers is unobservable pre-reform and estimated using out-of-sample predictions based on the numbers derived from Form ADV with those obtained from Preqin during 2012-2021.

²³In contrast, many post-2012 registrations may reflect endogenous choices by advisers anticipating operational changes. A notable example is Sequoia Capital, which registered with the SEC in 2021 following its restructuring around an open-ended fund structure and hold public shares long after IPOs—changes that disqualified it from the venture capital exemption under the Dodd-Frank Act.

²⁴Figure C.2 indicates that the post-2012 decline is mainly driven by entry of unregistered advisers. In fact, de-registrations by active advisers are rare based on the Form ADV-W data. This pattern implies that

Short Transition Period and Timely Registrations. The SEC adopted the registration amendment in 2011Q2 and established a nine-month transition period that required compliance by 2012Q1. Figure 3 reveals a sharp spike in the quarterly number of initial registrations—approximately 570 PE fund advisers registered with the SEC at the *compliance deadline*. This single-quarter surge represents nearly 30% of all initial SEC registrations over the past two decades and there are no delayed registrations after the compliance deadline. The clustering of registrations at the compliance deadline indicates both strong regulatory enforcement and potential compliance costs perceived by GPs. Moreover, the short nine-month transition window left GPs with limited scope for strategic manipulation of their registration status. For example, a GP that raised a \$500 million buyout fund in 2010 would be required to register unless it liquidated most assets by 2012Q1—a prohibitively costly action for most funds.

Persistent Increase in Disclosure. Figure 2b presents the actual and predicted number of Form ADV filed by registered PE fund advisers each year.²⁵ The Dodd-Frank Act has led to a permanent increase in the number of Form ADV filings, which ask advisers to periodically report and amend information about their operation and disciplinary history. Therefore, the reform has improved the transparency of PE markets.

4.2 Limited Aggregate Change in Fund Characteristics

The size and timing of registrations in Section 4.1 suggests that advisers have limited ability to manipulate their registration status in the short run. However, advisers might avoid registration in the long run by gradually changing their fundraising characteristics over time. This concern is largely alleviated by the patterns observed in Form ADV filings, as illustrated in Figure 4. The figure reveals minimal long-run variation in the composition of advisers relying on different registration exemptions under the Dodd-Frank Act.²⁶

So why don't advisers change their fund characteristics to qualify for the new registration exemptions? Advisers face significant costs when attempting to limit their size below the \$150 USD regulatory threshold because their compensation increases with the total fund size. In fact, estimates from Metrick and Yasuda (2010) suggest that over \$17.5 is allocated

it is difficult for advisers to undo the effects of SEC registrations.

²⁵The predicted value is estimated by a model fitted with a quadratic time trend for the 2001-2011 period.

²⁶ection C.1 further shows limited change in PE fund characteristics over time based on fundraising data.

as compensation to PE fund advisers for every \$100 raised by a PE fund. Furthermore, advisers cannot easily shift towards VC funds either, because their fundraising decisions are affected by various factors such as investment opportunities, supply of capital, and human capital constraints. Collectively, the stylized facts based on regulatory filings and fundraising indicate limited distortion of fundraising incentives faced by GPs post-reform.

4.3 Registration Status and Regulatory Oversight

To quantify the relationship between SEC registration and regulatory oversight, I use Form ADV filings to analyze the difference between registered and unregistered advisers regarding their likelihood of receiving regulatory actions. Specifically, I estimate the following regression based on the panel data of advisers constructed from Preqin and Form ADV filings:²⁷

$$Disciplinary\ Action_{jt} = \beta \times Registered_{jt} + \boldsymbol{\theta}' \mathbf{X} + \boldsymbol{\tau}_t + \boldsymbol{\delta}_{state} + \epsilon_{jt} \quad (1)$$

in which j and t denote a GP and a year. *Disciplinary Action* is a measure of disciplinary actions received by the GP in a year. *Registered* is an indicator variable equal to one if the GP is registered with the SEC in a given year, and zero otherwise. *Registered* varies within a GP, due to change in a GP's registration status—mainly in 2012 (Figure C.1). The regression includes a vector of control variables \mathbf{X} , which are *Ln(GP Size)*, *Number of Funds Raised*, and *Buyout* defined in the table note. These GP characteristics are related to the registration exemptions under the Investment Adviser Act and Dodd-Frank Act (see Section 2.2). $\boldsymbol{\tau}_t$ and $\boldsymbol{\phi}_{state}$ are year and GP state fixed effects. The standard errors are clustered at the GP level to address serial correlations.

Across all columns in Table 2, the coefficient estimates of *Registered* are positive and highly significant suggesting that registered advisers are more likely to receive regulatory actions. From Column (1) to (5), the outcome variables are a set of indicator variables equal to one if the adviser received certain regulatory actions as indicated by the variable name, such as censure, disgorgement, and monetary fine, and zero otherwise in each year. In Column (6), $Ln(1 + Fine\ Amount)$ is the natural logarithm of one plus the amount of

²⁷Although unregistered advisers were exempt from filing Form ADV prior to the Dodd-Frank Act's implementation in 2012, they must disclose any disciplinary histories from the previous ten years in their Form ADV filings after the regulatory intervention. Therefore, unregistered advisers' pre-intervention disciplinary information is observable.

finer in USD MIL the adviser receives in one year. For example, Column (1) indicates that registered advisers are 2.8 percentage points more likely to receive regulatory actions in a given year, while the unconditional mean is only around 1.1 percent. Overall, SEC-registered advisers face stronger regulatory oversight compared to unregistered advisers.²⁸

5 LPs’ Response to Regulatory Oversight of PE Funds

It is an empirical question how regulatory oversight of PE funds would affect financial intermediation in the PE market. On the one hand, the PE market features limited disclosure and a lack of market prices, which potentially make market discipline insufficient in governing PE funds—even though their investors are predominantly financial institutions (Stiglitz, 1993; Shleifer, 2005; Zingales, 2009). Regulatory oversight could help to align GPs’ incentives with LPs’, facilitating intermediation in PE investments. On the other hand, regulators are not inherently better informed than investors and face their own incentive problems, and the political process of regulation may be susceptible to regulatory capture by the very industries it aims to oversee (Coase, 1960; Stigler, 1971; Posner, 1974). Regulatory oversight may prove ineffective and even costly for LPs, without necessarily impacting or possibly even reducing their PE market participation.

The previous section presented evidence that, with strong enforcement, the Dodd-Frank Act exogenously expanded regulatory oversight of PE funds, subjecting many GPs to mandatory examinations, rules, and disclosure requirements. In this section, I leverage this shock as a quasi-natural experiment to examine how LPs change their market participation in response to increased regulatory oversight of GPs.

5.1 Identification Strategy

5.1.1 Research Design

My empirical design exploits quasi-random variation in regulatory oversight of GPs among LPs’ pre-existing relationships, introduced by the Dodd-Frank Act. LPs are arguably more exposed to this shock if they have more *pre-existing* relationships with GPs that became

²⁸The finding is consistent with Charoenwong, Kwan, and Umar (2019), which documents that client complaints over mid-sized investment advisers increased after their regulatory jurisdiction was shifted from the SEC to state securities regulator after the Dodd-Frank Act. My results remain qualitatively similar but only marginally significant after adding GP fixed effects, due to limited within-GP variation in the outcome variables.

newly registered following the regulatory intervention.²⁹ Specifically, I estimate the following difference-in-differences (DiD) regression with LP-year panel data:

$$y_{i,t} = \beta \times \text{Regulatory Exposure}_i \times \text{Post}_t + \phi_i + \tau_t + \epsilon_{i,t} \quad (2)$$

in which i and t index LP and year respectively. The outcome variable y captures the delegated investment activities, measured by capital commitments and direct investments. *Regulatory Exposure* is an indicator variable equal to one if the share of newly registered GPs in the LP's pre-existing LP-GP relationships is in the top quintile group, and zero otherwise. *Post* is an indicator variable equal to one in or after 2012, the effective year of the Dodd-Frank Act, and zero otherwise.³⁰ ϕ_i and τ_t are LP and year fixed effects. Although LPs do not form their relationships with GPs randomly, the inclusion of LP fixed effects absorbs any time-invariant LP characteristics, such as manager selection skills and access to GPs, that might be correlated with LP-GP matching and LPs' delegated investment decisions (e.g., [Lerner, Mao, Schoar, and Zhang, 2022](#)). In an alternative specification, I control for LP size measured by the capital committed to PE funds along with the direct investments made by an LP in the past 10 years, similar to [Lerner, Schoar, and Wongsunwai \(2007\)](#). Standard errors are clustered at the LP level to address serial correlations.

Recent literature emphasizes that difference-in-differences estimates may be biased due to staggered or potentially endogenous timing of the treatment (e.g., [Goodman-Bacon, 2021](#); [Baker, Larcker, and Wang, 2022](#)). Such an issue is less of a concern in my setting because the regulatory intervention has a single and plausibly exogenous timing. As discussed in detail in Section 2.2, the narrowed registration exemptions of PE fund advisers are one of the many regulatory changes introduced by Congress through the Dodd-Frank Act to monitor systemic risks in different financial markets after the 2008 financial crisis, which originated *outside* the PE industry.

²⁹Similar empirical designs based on pre-existing relationships have been used extensively in the banking literature. See, for example, [Chodorow-Reich \(2014\)](#).

³⁰I choose 2012, the effective year, rather than 2011, the adoption year of Title IV of the Dodd-Frank Act, because most advisers waited until the compliance deadline in March 2012 to register, as shown in Figure 3. See Section 2.2 for more institutional details.

5.1.2 Sticky LP-GP Relationships

One crucial assumption of my measure is that LP-GP relationships are persistent over time. Otherwise, LPs could costlessly switch to registered GPs beyond their pre-existing LP-GP relationships and there would be no reason to expect differential outcomes across LPs after the regulatory intervention. To provide evidence for this persistence, I estimate the following regression with all possible GP-LP relationships for varying length n :

$$Invest_{i,j,k+n} = \rho_n \times Invest_{i,j,k} + \mathbf{FES} + \epsilon_{i,j,k+n} \quad (3)$$

in which $Invest_{i,j,k}$ is an indicator variable equal to one if LP i invests in the k -th PE fund raised by GP j , and zero otherwise. The pass-through coefficient ρ_n quantifies the persistence of LP-GP relationships at different “lengths”. If existing LP-GP relationships have no predictive power on future LP-GP relationships, then ρ would be zero. If LP-GP relationships are perfectly persistent, ρ would be one.

The baseline specification controls for a GP’s average market share by including GP fixed effects. Then, I allow the market share to be time-varying by including GP by year fixed effects. However, it is possible that some GPs may specialize in raising capital from particular types of LP investors, for example, due to LPs’ home bias or non-pecuniary objectives. If so, the repeated fund investments could reflect GP specialization rather than true persist relationships. I address this concern by adding fixed effects that control for a GP’s market share separately by LP state and type. In the tightest specification, I further control for fund characteristics by including a fund type dummy, based on whether the fund is a VC or buyout fund, and fund size dummies, based on the fund’s size quintile, as well as fund number dummies.

Table 3 reports the path-through coefficients and provides strong support for persistence in LP-GP relationships. The coefficients across all columns are large in magnitude and highly significant. For example, Panel A Column 1 indicates that LPs have approximately 40 percentage points greater likelihood of reinvesting in the next fund if they invest in the current fund raised by a GP, while the unconditional mean is less than 0.5 percent.³¹

³¹Figure C.4 shows that over 50% of LPs in a PE fund have invested in an earlier fund managed by the

While the pass-through coefficient decreases with additional fixed effects and time length, the estimates remain highly significant and large in magnitude. The pattern is consistent with the general view of limited fund access in the PE fund industry and can result from various costs in establishing new relationships, such as information asymmetry, market power, search and matching frictions (e.g., [Lerner, Schoar, and Wongsunwai, 2007](#); [Sensoy, Wang, and Weisbach, 2014](#); [Abuzov, Gornall, and Strebulaev, 2025](#)).

Even with sticky LP-GP relationships, expanded regulatory oversight would likely lead to limited differential outcomes across LPs if they were able to invest *only* in funds managed by registered advisers in their pre-existing relationships. However, this becomes challenging if LPs face rationing in the supply of such funds due to strong investor demand., as evidenced by Figure C.5. Around 60% of registered funds’ final size exceeds their target size at fundraising, while only 42% of unregistered funds are oversubscribed. The difference is statistically significant at the 1% level a multivariate regression that accounts for different fund characteristics, such as fund type, sequence number, and vintage year.

5.1.3 Potential Selection into Newly Registered GPs

While LP-GP relationships are sticky, they are not formed randomly. To mitigate endogenous matching, my empirical design only exploits pre-existing relationships formed before the regulatory intervention, both the timing and exemptions of which were largely unanticipated by LPs and GPs (see Section 2.2). Moreover, the short nine-month transition window (see Figure 3) between the announcement and effective date of the intervention implies that GPs have limited ability to manipulate their registration status in the short run, which is supported by the stylized facts in Sections 4.1. Due to various costs associated with changing fund characteristics, advisers also do not systematically avoid registration in the long run as shown in Section 4.2. Therefore, the cross-sectional variation in the share of newly registered GPs in LPs’ pre-existing relationships is plausibly orthogonal to LP characteristics.

To assess potential selection bias in the DiD design, I estimate a linear probability model analyzing LP characteristics associated with high exposure to newly registered GPs. Using the same LP cross-section as my primary analysis, I find that both LP types and same adviser and the percentage of returning LPs is stable for both unregistered and registered advisers. The high degree of continuity in the investor base has also been documented by [Lerner and Schoar \(2004\)](#).

states—despite their established role in LP-GP matching (Lerner, Schoar, and Wongsunwai, 2007; Hochberg and Rauh, 2013)—fail to significantly predict exposure to newly registered GPs. As Figure 5 shows, nearly all coefficients are economically small and statistically insignificant, mitigating selection concerns. Furthermore, Appendix C.2 supplements my analysis with comprehensive public pension fund characteristics available in the Public Plan Database and demonstrates that none of these observable characteristics predicts selection into high exposure to newly registered GPs.

5.2 Main Findings

5.2.1 PE Fund Investments

As shown on the left in Figure 1, institutional investors such as pension funds, endowments, and insurance companies usually outsource their PE investments by committing capital to external fund vehicles. As the financial intermediary, the PE fund is managed by advisers who are mainly incentivized through compensation contracts which inevitably distort the advisers’ incentives when information frictions exist (see Section 2.1). Regulatory oversight can complement market monitoring and incentive contracts in at least two important ways. First, the regulator acts as the “delegated monitor” that examines fund advisers periodically, reducing opportunistic behaviors. Second, mandatory disclosure improves the contracting environment, enabling investors to write and enforce contracts more effectively to incentivize their fund advisers.

I find that regulatory oversight of intermediaries facilitates financial intermediation across several proxies for fund investments. Table 4 presents the DiD estimates from Equation (2) for capital commitments to PE funds using outcome variables such as *Capital Commitment*, an indicator variable equal to one if the LP commits capital to PE funds in the year, and zero otherwise. In Columns (1)-(6), the coefficient estimates of *Regulatory Exposure* \times *Post* are positive and significant at the 1% level. For example, Columns (1) and (2) suggest that the probability of LPs committing capital to PE funds has risen by 9.4% percentage points (around 28% of the unconditional mean) per year after the Dodd-Frank Act mitigates the agency frictions of newly registered PE fund advisers. The inclusion of LP fixed effects in the even Columns allows me to control for unobservable time-invariant LP characteristics that might be correlated with both their pre-existing relationships with GPs

and their committed capital. In Columns (3)-(6), I find consistent results using alternative measures of capital commitments based on the number of funds invested and the amount of committed capital.

Figure 6a plots the dynamic event-study plot for each year with the *Capital Commitment* as the dependent variable. It allows us to evaluate the parallel trend assumptions without imposing any ex-ante restrictions on when capital commitments should change. Figure 6a shows evidence that there is no significant pre-trend but a persistent increase in the likelihood of capital commitments by LPs with greater exposure to the increase in regulatory oversight of PE funds after the reform.

5.2.2 PE Direct Investments

Instead of holding private equity indirectly through PE funds, investors can directly purchase shares issued by private companies through direct investments, as illustrated on the right of Figure 1 (Fang, Ivashina, and Lerner, 2015; Braun, Jenkinson, and Schemmerl, 2020). On the one hand, direct investments allow investors to mitigate agency frictions in their outsourced managerial relationships.³² On the other hand, direct investments imply that investors give up the benefits of financial intermediation such as lower transaction costs and greater diversification (e.g., Benston and Smith, 1976; Leland and Pyle, 1977; Chan, 1983; Diamond, 1984). Therefore, investors trade off the agency costs and benefits of financial intermediation when deciding whether they should bypass PE funds. Since regulatory oversight reduces the agency costs associated with intermediation, it should decrease investors' incentives to bypass intermediation.

The results in Table 5 support this prediction. LP investors are less likely to bypass their GPs when regulatory oversight reduces the agency costs of financial intermediation. As reported in Column (1), in which *Direct Investment* is an indicator variable equal to one if the LP makes direct investments in private companies in the year and zero otherwise, the coefficient estimates of *Regulatory Exposure* \times *Post* is negative and statistically significant,

³²Reducing PE fees is usually the most important reason for direct investments. This motivation reflects concerns for potential rent extraction and misaligned incentives in the compensation contracts—if the compensation contract were efficiently designed and implemented, investors would consider high fees justifiable since they attract scarce managerial talent and rewards strong performance ex-post. Other benefits of direct investments include the ability to selectively invest in private companies, market timing, as well as flexibility in managing PE allocation and risk exposure (Fang, Ivashina, and Lerner, 2015).

indicating an approximately 1.4 percentage decrease (around 35% of the unconditional mean) in the probability of making direct investments each year in the post-period for investors that face lower agency costs in the financial intermediation of PE investments. The results remain quantitatively and qualitatively similar when we add LP fixed effects or use alternative measures of LPs’ direct investments as shown in Columns (2)-(6) of Table 5.

The identification assumption requires that direct investment activities would have evolved similarly between LPs with high and low shares of newly registered advisers in their pre-existing relationships. It is supported by the pattern in Figure 6b, which indicates a lack of pre-trends but a significant decrease in the event-study estimates following the effective year of the Dodd-Frank Act.

5.2.3 Cross-sectional Heterogeneity based on GPs’ Disciplinary History

To establish a direct link between regulatory oversight and agency costs, I exploit the disciplinary information reported by GPs in their Form ADV filings. LPs should not indiscriminately react to regulatory oversight of their GPs. Instead, their response should be stronger if their GPs have higher susceptibility to agency frictions—particularly those with previous disciplinary history. Moreover, LPs face more severe principal-agent problems when geographic distance makes it difficult to monitor and acquire information about their GPs.³³ I confirm these predictions by estimating a triple-difference design.

In Table 6 Panel A, *Misconduct* is an indicator variable equal to one if there is any GP with regulatory misconduct as of the effective year of the Dodd-Frank Act in the LP’s pre-existing LP-GP relationships, and zero otherwise. The regulatory misconduct disclosed in Form ADV is often related to insufficient or misleading information about fees, asset values, and similar matter Jiang, Mason, Qian, and Utke (2024). The positive and statistically significant coefficient estimates of $Regulatory\ Exposure \times Post \times Misconduct$ suggest that the effect of regulatory oversight is mainly concentrated among LPs connected to GPs with more misaligned incentives.

In Panel B, $Ln(1 + Distance)$ is the natural logarithm of one plus the average distance between an LP investor and its pre-existing GPs. $Regulatory\ Exposure \times Post \times Ln(1 +$

³³Existing studies have documented the importance of geographical proximity in overcoming agency frictions in various settings such as corporate payout, plant-level production, and VC investment (e.g., John, Knyazeva, and Knyazeva, 2011; Giroud, 2013; Bernstein, Giroud, and Townsend, 2016).

Distance) has positive and statistically significant slope in Columns (4) and (6), implying that regulatory oversight compliments monitoring when market discipline is less effective.

Overall, the cross-sectional heterogeneity can reject many potential confounding factors as alternative explanations to my results, unless they can explain why the positive impact of registration on capital commitments is mainly concentrated among LPs that are more exposed to misconduct and farther away from their GPs.

5.3 Alternative Explanations

The absence of pre-trends in the outcome variables and the cross-sectional heterogeneity presented in Section 5.2.3 provide strong support for causality. Moreover, the opposing directional changes in capital commitments and direct investments suggest that my findings are unlikely to be driven by unobservable LP characteristics that are correlated with broader secular trends in investors' allocation to private equity. However, I take further steps to discuss and address alternative explanations:

Secular Trends across Different GPs. The new registration exemptions are closely linked to the size of GPs and their investment strategies (Section 2.2). This connection raises potential concerns that the observed effects of registrations may not simply reflect the regulatory oversight themselves but could instead arise from underlying differences in investment opportunities or market dynamics, for instance, between smaller and larger GPs or between GPs managing buyout funds versus those managing VC funds. To address these concerns, I re-estimate my baseline regressions allowing LP outcomes to evolve along flexible time trends based on the characteristics of GPs in LPs' pre-existing relationships. This approach controls for potential confounding variations across GPs with different size or investment strategy over time. Table 7 Panel A reports these estimates, which are quantitatively and qualitatively similar to my main findings.

Furthermore, evidence from within-GP estimation detailed in Appendix C.3 reveals that GPs with different size or investment focus exhibit similar fundraising outcomes before and after the Dodd-Frank Act (Figure 7). In contrast, GPs that become registered subsequently raise more funds. Overall, these findings suggest that my main findings are unlikely to be driven by LPs' pre-existing differences in their GP characteristics, but rather reflect the direct impact of the regulatory intervention itself.

Volcker Rule. Another important regulatory intervention introduced by the Dodd-Frank Act is the Volcker Rule, which prohibits banks from investing in private equity (Chen and Ewens, 2024). My analysis remains robust to excluding bank LPs recorded in Preqin (see Table C.4 Panel A). Second, I account for potential spillovers through local fundraising markets. Since GPs tend to raise funds from local LPs, the Rule’s constraints on bank LPs could potentially lead to a greater supply of PE funds to non-bank LPs in the same region and affect their PE investment decisions (Hochberg and Rauh, 2013). I rule out this explanation by including year-by-LP-state fixed effects, which absorb any time-varying shocks at the LP-state level. The coefficient estimates reported in Table 7 Panel B remain similar quantitatively and qualitatively.

Other Confounding Financial Regulations. As an overhaul of the US financial systems after the 2008 financial crisis, the Dodd-Frank Act might have introduced other confounding regulations that indirectly affect financial institutions differentially. Crucially, LPs’ exposure to these potential shocks is unlikely to correlate systematically with their pre-existing relationships to newly registered PE fund advisers. Furthermore, I mitigate such concerns in two ways. First, Table 7 Panel B reports results with year-by-LP-type fixed effects, taking into account the systematic differences in terms of balance sheets, investment objectives, and exposure to economic and regulatory shocks across LPs. Second, Table C.4 Panel B restricts the sample to endowments and foundations. They are subject to substantially lighter regulation than pensions, insurers, and banks due to their lack of guaranteed, public liabilities. The consistency of results across both specifications supports the robustness of my findings.

Supply of Co-investment Opportunities. A supply-side explanation could argue that registration requirements potentially constrained GPs’ ability to offer customized co-investments to LPs due to compliance policies or potential fiduciary duty scrutiny, leading to standardized fund structures manifested through increased fund investments and reduced direct investments. Table C.5 rejects this explanation by demonstrating that registered GPs are actually more likely to establish co-investment funds—precisely the type of customized investment vehicles this explanation would predict they would avoid. The pattern in Table C.5 aligns with the fact that registered PE firms tend to be larger and better resourced, giving them

greater capacity to structure and administer complex co-investment programs.³⁴

Fundraising Distortion. If advisers were to systematically avoid registration by reducing fund size to qualify for the size-based exemption (the “private fund exemption”), then the decrease in PE fund supply would be stronger for LPs with low exposure to newly registered advisers and spill over to direct investments. Consequently, compared to these low-exposure LPs, high-exposure LPs may relatively have more fund investments and fewer direct investments after the reform. However, two pieces of evidence reject this fundraising distortion channel. First, the fundraising distortion channel predicts that the effect on fund investments would be concentrated in buyout funds and muted in VC funds, as the size-based exemption does not distort GPs’ incentives to raise smaller VC funds (see Section 2.2). Table C.6 demonstrates that my results remain quantitatively and qualitatively similar when restricting to the VC market. Second, C.3a indicates rather limited change in the distribution of fundraising after the intervention, showing little evidence of widespread strategic exemption-seeking behavior that might drive my findings.

Reporting Issues. Commercial data providers including Preqin have incomplete coverage of PE fund investments. A potential concern is that the increased PE fund investments by high-exposure LPs might merely reflect enhanced reporting by newly registered GPs rather than true investment changes among LPs. However, Table C.7 mitigates this concern by demonstrating that GPs do not become more likely to report their fund-level LPs or their committed capital after becoming registered with the SEC.

6 Capital Allocation Implications of Disintermediation

From a social planner’s perspective, the organizational structure of PE markets matters if there are capital allocation implications. Given that most LP investors lack expertise in due diligence and post-investment management of private companies, a pertinent question arises: which types of companies do LPs tend to finance directly, and do these companies exhibit lower quality compared to those financed by PE funds? This section delves into the potential implications of disintermediation in PE markets on these aspects.

³⁴In fact, the Dodd-Frank Act did not impose explicit restrictions on co-investment opportunities. In 2023, the SEC adopted new rules that sought to regulate co-investment arrangements, including how investment advisers charge co-investment fees and expenses, and the use of side letters that grant preferential treatment to certain LP investors. However, the US Court of Appeals for the Fifth Circuit subsequently struck down these 2023 rules, finding that the SEC lacked statutory authority to impose them.

To investigate the relationship between LP direct investments and a set of company characteristics, I estimate regressions using *LP Ratio (%)*, the percentage of PE investors that are limited partners in a deal, as the dependent variable and the companies' characteristics as independent variables. One advantage of examining the deal-level share of LP investors is that we can largely isolate companies' demand for private capital, which is positively correlated with the denominator in the share variable. The results are reported in Table 8.

In Column (1), the independent variable *Early Stage* is an indicator variable equal to one if the company is raising capital in a VC deal with a round number below Series C, and zero otherwise. Column (1) reveals a strong negative correlation between the maturity of the company and the share of LP investors directly providing capital to it. This result suggests that information asymmetry is an important friction that could potentially affect capital allocation if LPs invest in private companies without the expertise of specialized intermediaries. Such an idea is confirmed by the results in Columns (2) and (3), in which the independent variables are company age in years and number of the funding round that the company is raising. Both variables measure the amount of information available on the company and have positive coefficient estimates at the 1% significance level.

In Column (4), the independent variable $\ln(1 + \text{Capital Raised})$ captures the size of a company since companies that have raised more capital are arguably larger. The estimated coefficients are positive and highly significant, supporting the idea that LP investors tend to finance larger companies. These companies are potentially more visible for LPs which have limited deal sourcing compared to their GPs.

Column (5) reports the estimates in which the independent variable is *Number of Highly Cited Patents / Deal Size*, the number of (eventually granted) highly cited patents applied for in the next three years, scaled by the deal size. Highly cited patents are defined as those with the top quintile numbers of citations among patents granted in the same year. A one-standard-deviation increase in this variable would lower the LP ratio by 4%.

Combined together, the results in Table 8 are consistent with the extreme corporate finance challenges in financing private companies, such as information asymmetry and uncertainty as well as low asset tangibility. Moreover, the large minimum investment threshold in PE deals reduces LPs' risk diversification when making direct investments, while GPs

can pool capital from a large number of LPs and spread capital across a diverse range of investments. These frictions imply that younger, more risky, and more innovative firms would be underfunded in a disintermediated PE market compared to a market with financial intermediation. The potential capital allocation inefficiency provides a rationale for the role of policy intervention to facilitate intermediation in PE markets.

7 Conclusion

Financial intermediation plays a vital role in the efficiency of complex economies. However, policy intervention might be necessary when market forces fail to sufficiently align the interests of financial intermediaries with their investors' due to pervasive information frictions.

This paper provides causal evidence that regulatory oversight mitigates agency frictions associated with intermediation and enhances the organizational structure of financial markets. My empirical setting utilizes the Dodd-Frank Act, a landmark change that significantly expanded the regulatory oversight of PE funds by subjecting many fund advisers to examinations, rules, and disclosure. While PE investors can achieve better monitoring and obtain a wider range of incentive tools by organizing PE investment activities within their own organizations, the associated disintermediation in PE markets may shift capital allocation towards more mature, larger, and less innovative companies due to investors' limited ability to overcome asymmetric information and under-diversification when financing private companies directly.

While there are several reasons to regulate PE funds, such as investor protection, market transparency, and market efficiency, new regulations usually impose operational, administrative, and transaction costs on PE fund advisers. Many of these will ultimately be passed on to investors in the form of lower returns. Therefore, this paper can inform the active debate over the costs and benefits of regulation in PE markets, which have played an increasingly important role in nearly every sector of the economy.

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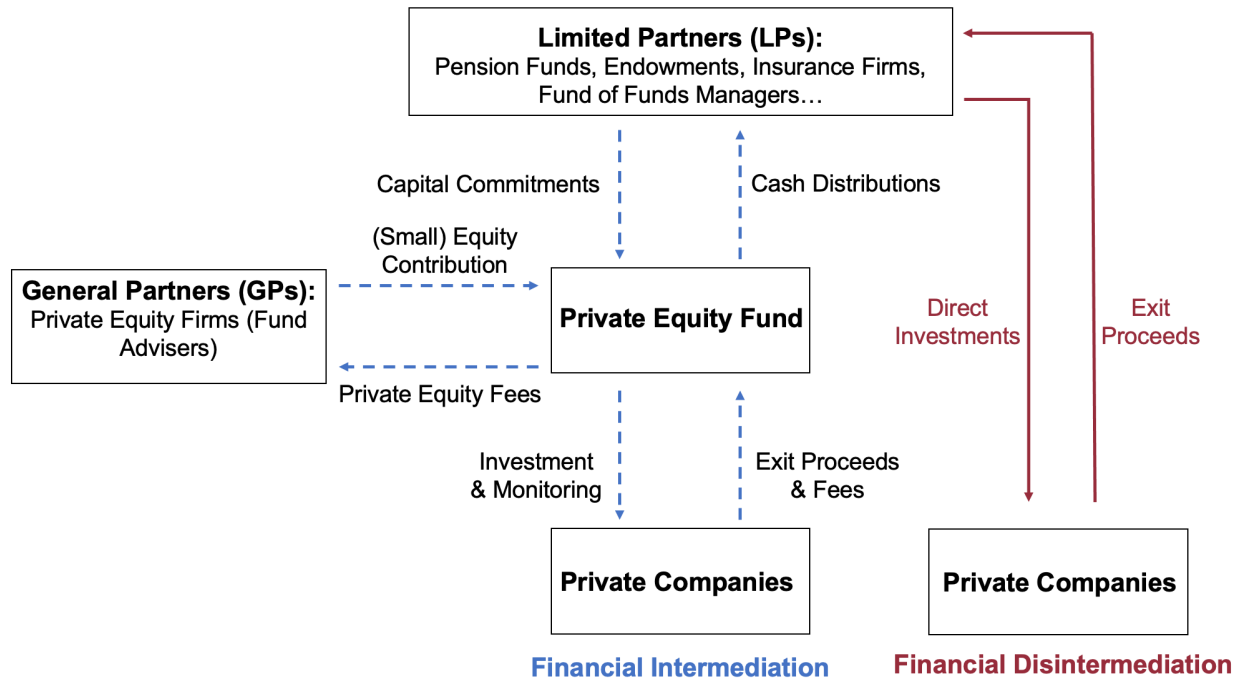
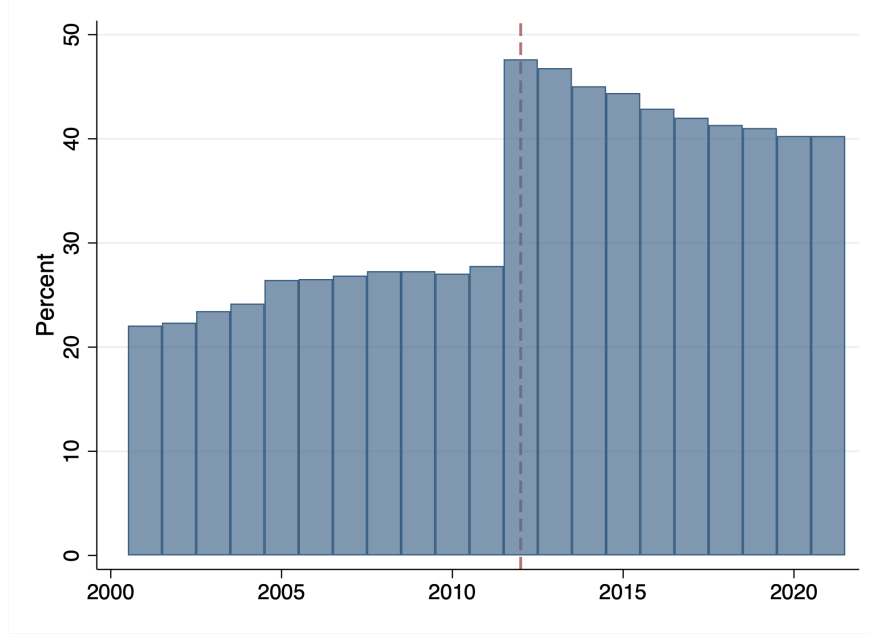
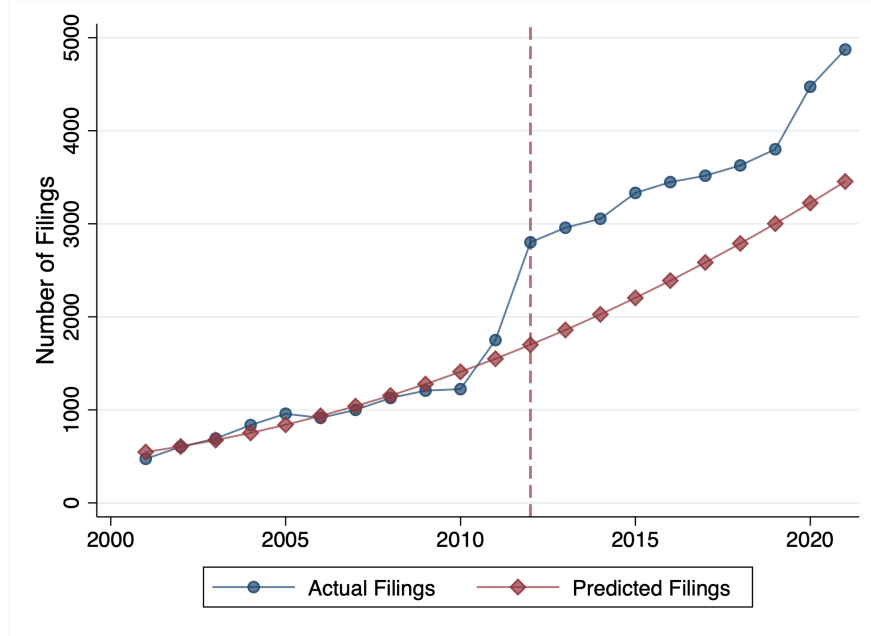


Figure 1: Stylized Representation of the PE Market Organizational Structure

This figure illustrates the stylized representation of the PE market organizational structure. On the one hand, the market is intermediate by PE funds, as shown in the blue dashed arrows on the left (Da Rin, Hellmann, and Puri, 2013). In this setting, PE fund advisers, also referred to as general partners (GPs), select, monitor, and exit private companies on behalf of their limited partner (LP) investors in exchange for various fees discussed in more detail in Section 2.1. On the other hand, these institutional investors can directly purchase private equity issued by companies without the intermediation of PE funds, as shown in the red solid arrows on the right (Fang, Ivashina, and Lerner, 2015; Braun, Jenkinson, and Schemmerl, 2020). This process is known as LP direct investing and allows LPs to reduce agency costs in outsourced relationships.



(a) Share of Advisers Registered with the SEC



(b) Number of Form ADV Filed by Registered Advisers

Figure 2: Dodd-Frank Act and the Expansion of Regulatory Oversight of PE funds

Figure 2a shows the share of PE fund advisers that are registered with the SEC over time. Registered advisers are subject to the SEC’s regulatory scrutiny, rules, and disclosure requirements. The total number of advisers is unobservable before 2012 and estimated using out-of-sample predictions based on a regression that fits the numbers derived from Form ADV with those obtained from Preqin during 2012-2021. Figure C.2a shows the number registered advisers over time. Figure 2b displays the actual and predicted number of Form ADV filed by registered PE fund advisers each year. The predicted value is estimated using a model fitted with a quadratic time trend for the 2001-2011 period. In each figure, the red vertical dashed line indicates 2012 when the Dodd-Frank Act became effective and significantly narrowed PE fund advisers’ registration exemptions.

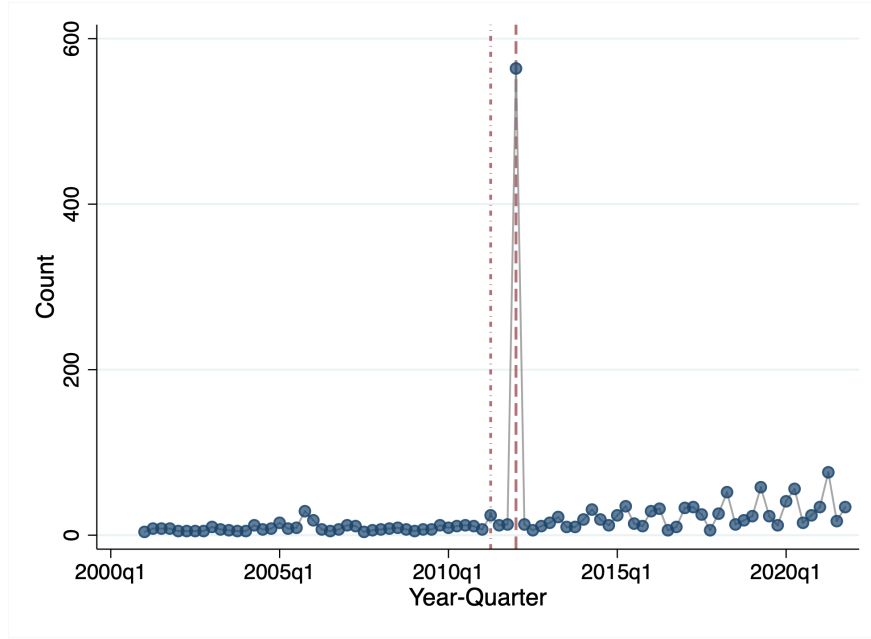


Figure 3: Registration Timing - Quarterly Number of Initial Registrations

Figure 3 highlights the registration timing by showing the quarterly number of initial registration filings submitted by PE fund advisers. While the Dodd-Frank Act was adopted by the SEC in 2011Q2 (red dash-dotted line), the compliance deadline was 2012Q1 due to the transition provisions that required advisers to be registered by the end of 2012Q1 (red dashed line). The short nine-month transition window between the announcement and effective date of the intervention implies that advisers have rather limited ability to change their fund characteristics and manipulate their registration status in the short run leading to a sharp increase in registrations. The clustering of registrations at the compliance deadline indicates both strong regulatory enforcement and potential compliance costs perceived by advisers.

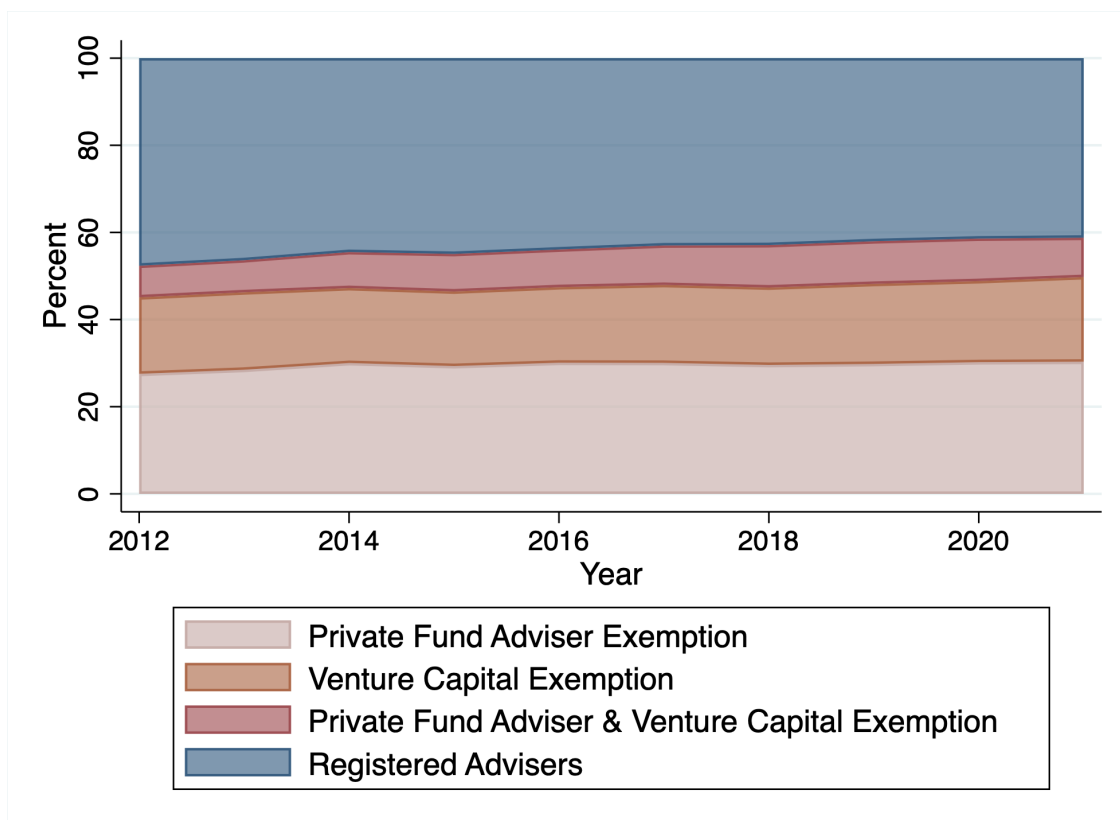


Figure 4: Share of Exempt Reporting Advisers by Qualified Exemption

Figure 4 shows the share of unregistered PE fund advisers, also known as exempt reporting advisers, by qualified new exemption under the Dodd Frank from 2012 to 2021. These unregistered advisers are shown in different shades of blue, while registered advisers are indicated in red. The figure indicates a limited aggregate change in PE fund characteristics across advisers post-reform. Advisers qualify for the private fund adviser exemption if solely advising private funds and have assets under management, as defined in rule 203(m)-1, in the US of less than \$150 MIL. Advisers qualify for the venture capital exemption if solely advising venture capital funds, as defined in rule 203(1)-1. The detailed regulatory definition is discussed in Appendix A. The figure indicates a lack of long-run change in PE advisers' characteristics after the Dodd-Frank Act, suggesting advisers do not systematically adjust fundraising to avoid registration.

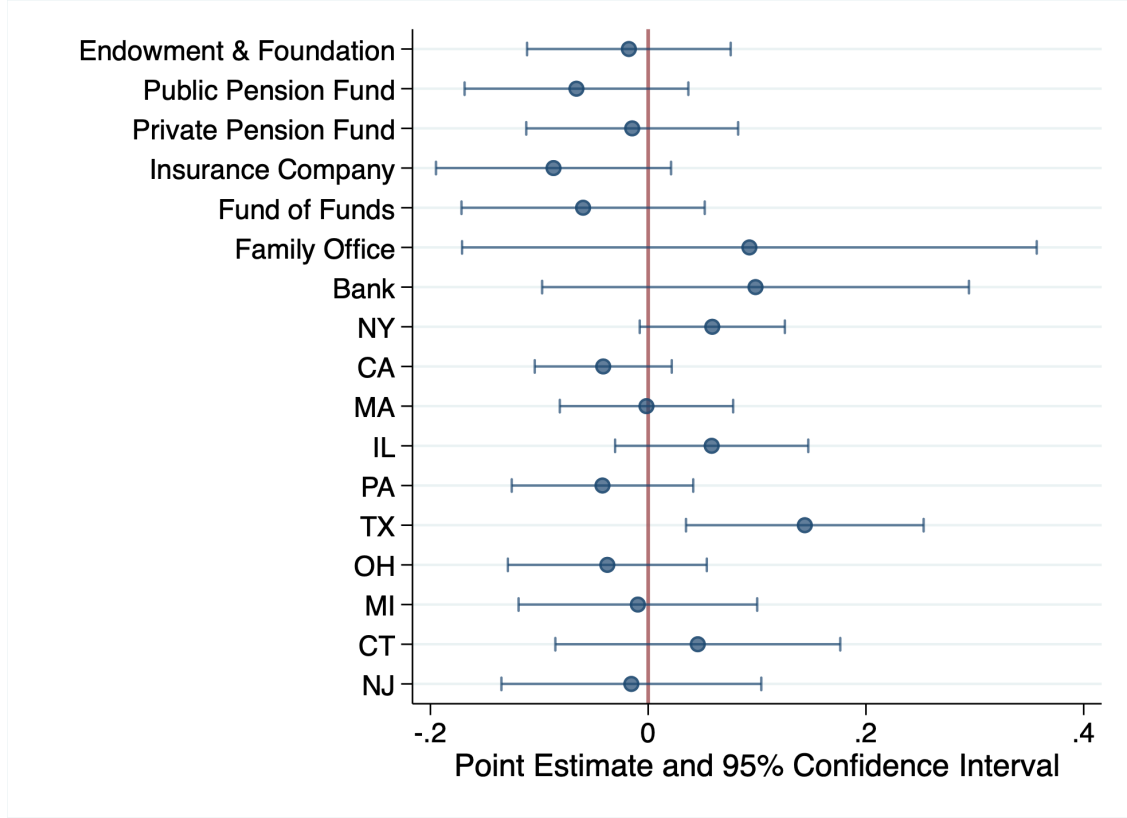
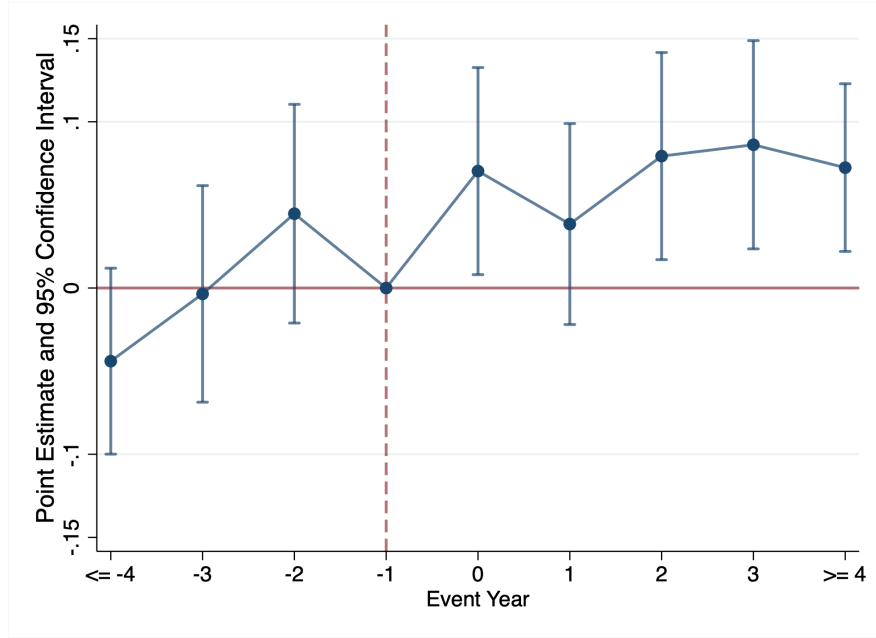
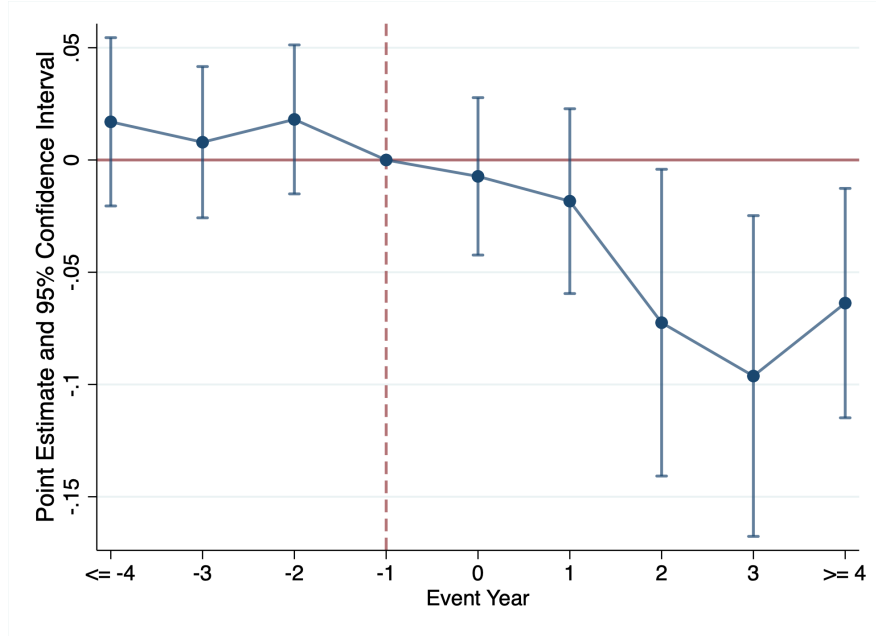


Figure 5: Linear Probability Estimates Explaining Exposure to Newly Registered GPs

This figure plots the linear probability coefficients and the associated two-tailed 95% confidence intervals from a cross-sectional regression of whether a LP has high exposure to newly registered GPs on dummy variables based on LP institutional types and headquarter states known to influence LP-GP matching as documented by [Lerner, Schoar, and Wongsunwai \(2007\)](#) and [Hochberg and Rauh \(2013\)](#). Huber-White standard errors are used. The outcome variable, *Regulatory Exposure*, is an indicator variable equal to one if the share of newly registered GPs in the LP's pre-existing LP-GP relationships is in the top quintile group, and zero otherwise. The omitted group for LP types includes institutions such as government agencies, investment trusts, and wealth managers. The omitted group for LP states includes the rest of the US states other than the top 10 LP states (NY, CA, MA, IL, PA, TX, OH, MI, CT, NJ). The estimates suggest that these LP characteristics have little explanatory power of whether a LP has high exposure to newly registered GPs, supporting quasi-random variation of LPs' exposure to the regulatory shock. Appendix C.2 leverages the comprehensive public pension fund characteristics available in the Public Plan Database and demonstrates that none of these observable characteristics predict selection into high exposure to newly registered GPs among public pensions.



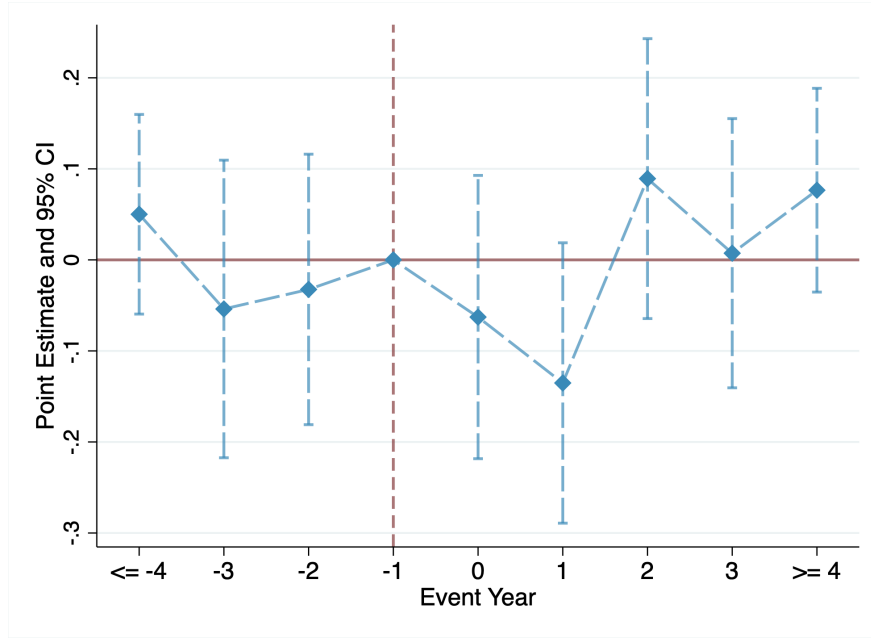
(a) Capital Commitment



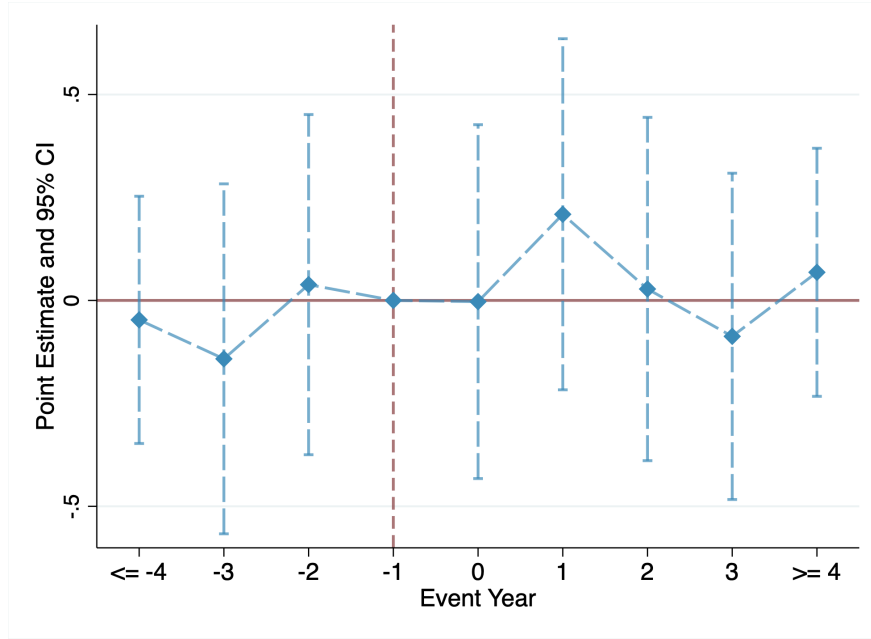
(b) Number of Direct Investments

Figure 6: Dynamic Effects of Regulatory Oversight on LP Investors' Delegated Investment

This figure plots the event-study coefficient estimates and associated two-tailed 95% confidence intervals of the difference between LPs with high (treatment group) and low exposure (control group) to newly registered GPs in their pre-existing LP-GP relationships. The coefficient in 2011 ($t = -1$) is normalized to zero. The red vertical dashed line indicates the base year of 2011, the year before the Dodd-Frank Act brought PE fund advisers under the SEC's regulatory oversight. The outcome variables are indicated in subcaptions. The regressions control for LP size and include year and LP fixed effects. Standard errors are clustered at the LP level.



(a) Large vs. Small Fund Managers



(b) Buyout vs. Venture Capital Fund Managers

Figure 7: Falsification Tests - Fundraising Dynamics Across GPs

As a falsification test to rule out secular trends across different GPs as an alternative explanation (Section 5.3), this figure plots the event-study coefficient estimates and associated two-tailed 95% confidence intervals of the difference between different GPs. The corresponding DiD estimates are reported in Columns (7) and (8) in Table C.3. The coefficient in 2011 ($t = -1$) is normalized to zero. The red vertical dashed line indicates the base year of 2011, the year before the Dodd-Frank Act brought PE fund advisers under the SEC's regulatory oversight. Standard errors are clustered at the GP level.

Table 1: Summary Statistics

This table reports the summary statistics of the main variables in my analysis. For Panel A, the sample consists of 1,188 unique US private equity (PE) fund advisers, also known as general partners (GPs), during the period 2001-2021. A unit of observation is a GP-year. The value of indicator variables *Regulatory Action*, *Censure*, *Disgorgement/Restitution*, *Cease and Desist*, and *Monetary Sanction* is scaled by 100. For Panel B, the sample consists of 1,522 unique US limited partner (LP) investors located during the period 2001-2021. A unit of observation is an LP-year. For Panel C, the sample consists of US PE deals raised by 68,471 unique companies during 2001-2021. A unit of observation is a PE deal, which can be either a venture capital or a buyout transaction. Detailed variable definitions are provided in Appendix B.

	Mean	Std.	p10	p25	p50	p75	p90	N
<i>Panel A: GP-Year Level</i>								
Registered	0.33	0.47	0.00	0.00	0.00	1.00	1.00	15,545
Regulatory Action	1.07	10.31	0.00	0.00	0.00	0.00	0.00	15,545
Censure	0.46	6.74	0.00	0.00	0.00	0.00	0.00	15,545
Disgorgement/Restitution	0.44	6.65	0.00	0.00	0.00	0.00	0.00	15,545
Cease and Desist	0.64	7.99	0.00	0.00	0.00	0.00	0.00	15,545
Monetary Sanction	1.03	10.09	0.00	0.00	0.00	0.00	0.00	15,545
Fine Amount (\$ MIL)	1.48	65.23	0.00	0.00	0.00	0.00	0.00	15,545
GP Size	1436.70	4422.12	53.00	130.00	350.00	1042.00	2665.00	15,545
Number of Funds Raised	2.49	2.30	1.00	1.00	2.00	3.00	4.00	15,545
Buyout	0.44	0.50	0.00	0.00	0.00	1.00	1.00	15,545
<i>Panel B: LP-Year Level</i>								
Regulatory Exposure	0.19	0.39	0.00	0.00	0.00	0.00	1.00	29,598
Post	0.51	0.50	0.00	0.00	1.00	1.00	1.00	29,598
Capital Commitment	0.33	0.47	0.00	0.00	0.00	1.00	1.00	29,598
Number of Funds	1.03	2.30	0.00	0.00	0.00	1.00	3.00	29,598
Commitment Amount (\$ MIL)	37.65	108.57	0.00	0.00	0.00	14.06	109.45	29,598
Direct Investment	0.04	0.19	0.00	0.00	0.00	0.00	0.00	29,598
Number of Direct Investments	0.10	0.89	0.00	0.00	0.00	0.00	0.00	29,598
Direct Investment Amount (\$ MIL)	1.54	52.73	0.00	0.00	0.00	0.00	0.00	29,598
LP Size (\$ MIL)	350.21	805.81	0.00	10.00	66.61	279.87	896.56	29,598
Misconduct	0.38	0.49	0.00	0.00	0.00	1.00	1.00	29,598
Distance (Miles)	911.62	665.74	57.56	391.38	869.49	1282.20	1705.59	29,598
<i>Panel C: Private Equity Deal Level</i>								
LP Ratio (%)	1.62	7.36	0.00	0.00	0.00	0.00	0.00	125,206
Early Stage	0.42	0.49	0.00	0.00	0.00	1.00	1.00	125,206
Company Age	11.33	17.08	1.00	2.00	5.00	12.00	31.00	108,917
Round Number	2.15	1.72	1.00	1.00	1.00	3.00	5.00	125,206
Capital Raised (\$ MIL)	67.19	195.41	1.05	3.37	12.42	42.10	126.49	81,177
Number of Highly Cited Patents / Deal Size	0.07	0.32	0.00	0.00	0.00	0.00	0.05	73,725

Table 2: SEC Registration and Regulatory Oversight of PE Fund Advisers

This table shows the relationship between PE fund advisers' SEC registration status and regulatory actions received by advisers for their misconduct, based on estimates from Equation (1). The sample consists of PE fund advisers, also known as general partners (GPs), located in the US during the period 2001-2021. A unit of observation is a GP-year. *Registered* is an indicator variable equal to one if the GP is registered with the SEC in a given year, and zero otherwise. The outcome variables are a set of variables based on regulatory actions disclosed by the advisers in their Form ADV filings. For example, *Regulatory Action* is an indicator variable equal to one if the GP receives regulatory disciplinary actions in the year, and zero otherwise. *Cease and Desist* is an indicator variable equal to one if the GP receives a cease and desist order in the year, and zero otherwise. $\ln(1 + \text{Fine Amount})$ is the natural logarithm of the fine amount in USD MIL. The regressions control for GP characteristics related to the registration exemptions under the Investment Adviser Act and Dodd-Frank Act (see Section 2.2). $\ln(\text{GP Size})$ is the natural logarithm of the amount of capital in USD MIL raised by PE funds managed by the adviser in the past 10 years. *Number of Funds Raised* is the number of PE funds raised by the GP in the past 10 years. *Buyout* an indicator variable equal to one if the GP manages buyout funds, and zero otherwise. Detailed variable definitions are provided in Appendix B. Standard errors are clustered at the GP level and reported in brackets. ***, ** and * indicate 1%, 5% and 10% significance level.

	Regulatory Action	Censure	Disgorgement/ Restitution	Cease and Desist	Monetary Sanction	$\ln(1 + \text{FineAmount})$
	(1)	(2)	(3)	(4)	(5)	(6)
Registered	0.028*** [0.008]	0.015** [0.006]	0.014*** [0.005]	0.019*** [0.006]	0.028*** [0.008]	0.057*** [0.021]
$\ln(\text{GP Size})$	0.002 [0.002]	0.001 [0.002]	0.001 [0.001]	0.001 [0.001]	0.002 [0.002]	0.008 [0.005]
Number of Funds Raised	0.001 [0.001]	0.000 [0.000]	0.001 [0.000]	0.001 [0.001]	0.001 [0.001]	0.001 [0.002]
Buyout	-0.007* [0.004]	-0.003 [0.003]	-0.003 [0.002]	-0.005** [0.003]	-0.008** [0.004]	-0.019 [0.013]
GP State FE	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓
Observations	15,535	15,535	15,535	15,535	15,535	15,535
Adjusted R^2	0.035	0.020	0.021	0.024	0.035	0.021

Table 3: Sticky LP-GP Relationships

This table shows the pass-through estimates from Equation (3) suggesting that LP-GP relationships are sticky in the private equity market. The sample includes all possible LP-GP relationships, both realized or unrealized, for funds raised from 2001-2021. $Invest_k$ is an indicator variable equal to one if an LP invests in the k -th PE fund raised by a GP, and zero otherwise. Each panel reports the path-through estimates for different n with the outcome variable indicated in the panel caption. For example, Panel A shows the incremental probability that an LP will invest in the next PE fund raised by the GP if the LP has invested in its current fund. Column (1) controls for a GP's average market share by including GP fixed effects. Column (2) allows the market share to be time-varying by including GP by year fixed effects. Column (3) adds GP by LP state and GP by LP type fixed effects to account for potential GP specialization by LP state or LP type. Column (4) further controls for fund characteristics by including a fund type dummy, based on whether the fund is a venture capital or buyout fund, and fund size dummies, based on the fund's size quintile, as well as fund number dummies. Standard errors are two-way clustered, at the LP and GP levels, and reported in brackets. ***, ** and * indicate 1%, 5% and 10% significance level.

	(1)	(2)	(3)	(4)
Panel A: $Invest_{k+1}$				
$Invest_k$	0.405*** [0.013]	0.405*** [0.013]	0.393*** [0.013]	0.392*** [0.013]
Observations	6,507,889	6,507,889	6,501,467	5,985,357
Adjusted R^2	0.190	0.193	0.196	0.198
Panel B: $Invest_{k+2}$				
$Invest_k$	0.287*** [0.016]	0.287*** [0.016]	0.274*** [0.016]	0.272*** [0.015]
Observations	4,070,636	4,070,636	4,066,895	3,792,964
Adjusted R^2	0.108	0.112	0.121	0.121
Panel C: $Invest_{k+3}$				
$Invest_k$	0.233*** [0.021]	0.233*** [0.021]	0.223*** [0.022]	0.220*** [0.019]
Observations	2,697,002	2,697,002	2,694,597	2,527,197
Adjusted R^2	0.082	0.086	0.099	0.098
GP FE	✓			
GP × Year FE		✓	✓	✓
GP × LP State FE			✓	✓
GP × LP Type FE			✓	✓
Fund Type FE				✓
Fund Size FE				✓
Fund Number FE				✓

Table 4: Regulatory Oversight of PE Funds and Investors' Fund Investments

This table investigates how regulatory oversight of fund advisers affects LP investors' outsourced PE investment measured by their capital commitments to PE funds. The sample consists of LP investors located in the US during the period 2001-2021. A unit of observation is an LP-year. *Capital Commitment* is an indicator variable equal to one if the LP commits capital to any PE funds in the year, and zero otherwise. *Number of Funds* is the number of PE funds the LP committed capital to in one year. $\ln(1 + \text{Committed Capital})$ is the natural logarithm of one plus the amount of capital in USD MIL committed to PE funds in one year. *Regulatory Exposure* is an indicator variable equal to one if the share of newly registered GPs in the LP's pre-existing LP-GP relationships is in the top quintile group, and zero otherwise. *Post* is an indicator variable equal to one if the year is or after 2012, the effective year of the Dodd-Frank Act, and zero otherwise. $\ln(\text{LP Size})$ is the natural logarithm of the capital committed to PE funds along with the direct investments made by an LP in the past 10 years. The stand-alone *Regulatory Exposure* is absorbed by the LP fixed effects. Detailed variable definitions are provided in Appendix B. Standard errors are clustered at the LP level and reported in brackets. ***, ** and * indicate 1%, 5% and 10% significance level.

	Capital Commitment		Number of Funds		Ln(1 + Committed Capital)	
	(1)	(2)	(3)	(4)	(5)	(6)
Regulatory Exposure \times Post	0.094*** [0.017]	0.094*** [0.017]	0.308*** [0.068]	0.280*** [0.067]	0.294*** [0.073]	0.288*** [0.072]
Ln(LP Size)		-0.001 [0.002]		0.074*** [0.010]		0.015 [0.010]
LP FE	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓
Observations	29,598	29,598	29,598	29,598	29,598	29,598
Adjusted R^2	0.350	0.350	0.573	0.575	0.470	0.470

Table 5: Regulatory Oversight of PE Funds and Investors' Direct Investments

This table investigates how regulatory oversight of fund advisers affects LP investors' incentives to bypass financial intermediation through direct investing. The sample consists of LP investors located in the US during the period 2001-2021. A unit of observation is an LP-year. *Direct Investment* is an indicator variable equal to one if the LP makes direct investments in private companies in the year, and zero otherwise. *Number of Direct Investments* is the number of direct investments in private companies made by the LP in one year. $\ln(1 + \text{Direct Investment Amount})$ is the natural logarithm of one plus the amount of direct investments in USD MIL made by the LP in one year. *Regulatory Exposure* is an indicator variable equal to one if the share of newly registered GPs in the LP's pre-existing LP-GP relationships is in the top quintile group, and zero otherwise. *Post* is an indicator variable equal to one if the year is or after 2012, the effective year of the Dodd-Frank Act, and zero otherwise. $\ln(\text{LP Size})$ is the natural logarithm of the capital committed to PE funds along with the direct investments made by an LP in the past 10 years. The stand-alone *Regulatory Exposure* is absorbed by the LP fixed effects. Detailed variable definitions are provided in Appendix B. Standard errors are clustered at the LP level and reported in brackets. ***, ** and * indicate 1%, 5% and 10% significance level.

	Direct Investment		Number of Direct Investments		$\ln(1 + \text{Direct Investment Amount})$	
	(1)	(2)	(3)	(4)	(5)	(6)
Regulatory Exposure \times Post	-0.013*	-0.014**	-0.066***	-0.072***	-0.033**	-0.035***
	[0.007]	[0.007]	[0.025]	[0.025]	[0.013]	[0.013]
$\ln(\text{LP Size})$		0.003***		0.014***		0.006***
		[0.001]		[0.004]		[0.002]
LP FE	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓
Observations	29,598	29,598	29,598	29,598	29,598	29,598
Adjusted R^2	0.394	0.395	0.510	0.511	0.426	0.427

Table 6: Cross-sectional Heterogeneity

This table investigates the cross-sectional difference in the impact of regulatory oversight on investors' PE investment decisions, based on LP investors' exposure to PE fund advisers with disciplinary history and their distance to PE fund advisers. The sample consists of LP investors located in the US during the period 2001-2021. A unit of observation is an LP-year. *Capital Commitment* is an indicator variable equal to one if the LP commits capital to any PE funds in the year, and zero otherwise. *Number of Funds* is the number of PE funds the LP committed capital to in one year. $\ln(1 + \text{Committed Capital})$ is the natural logarithm of one plus the amount of capital in USD MIL committed to PE funds in one year. *Regulatory Exposure* is an indicator variable equal to one if the share of newly registered GPs in the LP's pre-existing LP-GP relationships is in the top quintile group, and zero otherwise. Regulatory misconduct frequently involves insufficient or misleading information regarding fees, asset values, and similar matters. *Post* is an indicator variable equal to one if the year is or after 2012, the effective year of the Dodd-Frank Act, and zero otherwise. *Misconduct* is an indicator variable equal to one if there is any GP with regulatory misconduct as of the effective year of the Dodd-Frank Act in the LP's pre-existing LP-GP relationships, and zero otherwise. $\ln(1 + \text{Distance})$ is the natural logarithm of one plus the average distance between an LP investor and its pre-existing GPs. The stand-alone *Regulatory Exposure*, *Misconduct* and $\ln(1 + \text{Distance})$ are absorbed by the LP fixed effects. Detailed variable definitions are provided in Appendix B. Standard errors are clustered at the LP level and reported in brackets. ***, ** and * indicate 1%, 5% and 10% significance level.

	Capital Commitment		Number of Funds		Ln(1 + Committed Capital)	
	(1)	(2)	(3)	(4)	(5)	(6)
Regulatory Exposure \times Post	0.073*** [0.019]	0.021 [0.044]	0.106* [0.060]	-0.126 [0.105]	0.157** [0.076]	-0.180 [0.152]
Regulatory Exposure \times Post \times Misconduct	0.045 [0.043]		0.499*** [0.183]		0.325* [0.186]	
Misconduct \times Post	-0.055*** [0.017]		-0.457*** [0.103]		-0.327*** [0.079]	
Regulatory Exposure \times Post \times Ln(1 + Distance)		0.012 [0.008]		0.071*** [0.024]		0.078*** [0.028]
Ln(1 + Distance) \times Post		-0.006 [0.004]		-0.036** [0.017]		-0.038** [0.016]
LP FE	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓
Observations	29,598	29,598	29,598	29,598	29,598	29,598
Adjusted R^2	0.351	0.350	0.575	0.573	0.471	0.470

Table 7: Heterogeneous Time Trends

This table rules out alternative explanations based on different GP or LP dynamics by adding flexible trends across LPs. The sample consists of LP investors located in the US during the period 2001-2021. A unit of observation is an LP-year. Panel A controls for heterogeneous trends across LPs based on the GP characteristics in LPs' pre-existing relationships. Detailed in Appendix C.3, Table C.3 presents GP-level evidence that GPs with different sizes or investment strategies do not face different dynamics in investment opportunities after the Dodd-Frank Act. Panel B controls for heterogeneous trends based on LP characteristics. Table C.4 demonstrates that the findings remain robust when restricting to different subsamples of LPs based on institutional type. *Large GP Share* ranks LPs into quintile groups based on the share of large GPs in their pre-existing relationships. Large GPs are those that in the top quintile group based on the total amount of PE funds raised in the past ten years before 2011, the year before the Dodd-Frank Act becomes effective. *Buyout GP Share* ranks LPs into quintile groups based on the share of buyout GPs in their pre-existing relationships. Buyout GPs are those that raised buyout funds in the past ten years as of 2011. These GP characteristics are correlated with registration under the Dodd-Frank Act (see Section 2.2). *LP Type* are dummy variables based on the institutional types of LPs, such as public pension funds, private pension funds, endowments, and insurance companies. *LP State* are dummy variables based on the headquarter state of the LP. Detailed variable definitions are provided in Appendix B. Standard errors are clustered at the LP level and reported in brackets. ***, ** and * indicate 1%, 5% and 10% significance level.

	Capital Commitment	Number of Funds	Ln(1 + Committed Capital)	Direct Investment	Number of Direct Investments	Ln(1 + Direct Investment Amount)
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: GP Characteristics						
Regulatory Exposure \times Post	0.069*** [0.018]	0.188*** [0.068]	0.223*** [0.076]	-0.011 [0.007]	-0.048** [0.021]	-0.027** [0.012]
LP FE	✓	✓	✓	✓	✓	✓
Year \times Large GP Share FE	✓	✓	✓	✓	✓	✓
Year \times Buyout GP Share FE	✓	✓	✓	✓	✓	✓
Observations	29,039	29,039	29,039	29,039	29,039	29,039
Adjusted R^2	0.355	0.587	0.479	0.397	0.510	0.429
Panel B: LP Characteristics						
Regulatory Exposure \times Post	0.099*** [0.017]	0.344*** [0.068]	0.338*** [0.071]	-0.013* [0.007]	-0.058** [0.025]	-0.032** [0.013]
LP FE	✓	✓	✓	✓	✓	✓
Year \times LP Type FE	✓	✓	✓	✓	✓	✓
Year \times LP State FE	✓	✓	✓	✓	✓	✓
Observations	29,572	29,572	29,572	29,572	29,572	29,572
Adjusted R^2	0.373	0.595	0.495	0.395	0.515	0.428

Table 8: Relationships Between Company Characteristics and Direct Investments

This table reports results that investigate the link between a set of company characteristics and investors' direct investment in private equity. The sample consists of US PE deals during the period 2001-2021. A unit of observation is a PE deal. *LP Ratio (%)* is the percentage of PE investors that are limited partners in a deal. *Early Stage* is an indicator variable equal to one if the deal is a venture capital deal with a round number below Series C, and zero otherwise. *Company Age* is the age of the company in years. *Round Number* is the number of the funding round. *Ln(Capital Raised)* is the natural logarithm of the total amount of capital in USD MIL that the company has raised. *Number of Highly Cited Patents / Deal Size* is the number of (eventually granted) highly cited patents applied for in the next three years, scaled by the deal size. Highly cited patents are defined as those with the top quintile numbers of citations among patents granted in the same year. Deal type FE is a dummy variable based on whether the PE deal is a buyout or venture capital deal. Detailed variable definitions are provided in Appendix B. Huber-White standard errors are reported in brackets. ***, ** and * indicate 1%, 5% and 10% significance level.

	LP Ratio (%)				
	(1)	(2)	(3)	(4)	(5)
Early Stage	-1.537*** [0.071]				
Company Age		0.014*** [0.002]			
Round Number			0.396*** [0.021]		
Ln(Capital Raised)				0.585*** [0.022]	
Number of Highly Cited Patents / Deal Size					-0.210** [0.095]
Deal Year FE	✓	✓	✓	✓	✓
Deal Type FE	✓	✓	✓	✓	✓
Company State FE	✓	✓	✓	✓	✓
Company Industry FE	✓	✓	✓	✓	✓
Observations	125,206	108,917	125,206	81,177	73,725
Adjusted R^2	0.015	0.008	0.016	0.021	0.006

Online Appendix for
“Spreading Sunshine in Private Equity:
Financial Intermediation and Regulatory Oversight”

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A Appendix: Venture Capital Exemption

In this Appendix, I provide more details on the venture capital exemption enacted as part of Title IV of the Dodd-Frank Act as an illustrative example of Congress’ policy rationale in setting the new registration exemptions.¹ It highlights that the new registration exemptions are mainly set to monitor systemic risk in the wake of the 2008 financial crisis, which developed outside of the PE sector, as well as the complex trade-offs in introducing regulation into the PE market. First, I discuss the policy rationale for the venture capital exemption. Then, I present the SEC’s regulatory definition of “venture capital funds” and heated debates in the VC community on the scope of such definition.

A.1 Policy Rationale

The heart of the Dodd-Frank Act is to overhaul the US financial regulatory market, after the 2008 financial crisis, to evaluate systemic risk, increase market transparency and protect consumers. While the Senate voted to exempt all PE fund advisers from registration with the SEC, the final version of the Dodd-Frank Act only exempts advisers that meet the private fund adviser or venture capital exemptions. The fundamental policy rationale to distinguish VC funds from other private funds reflects Congress’ concerns regarding the potential for systemic risk based on the underlying investments and use of leverage among different private funds.

First, unlike many other private funds, VC funds invest in non-public start-ups, which are not directly connected to the public market and thus pose little systemic risk to the financial market or retail investors. Due to the nature of underlying assets, VC funds have much smaller aggregate size compared to the public equity market and other private funds such as hedge funds as pointed out by the SEC.

Second, VC funds do not rely on extensive leverage to make investments. As a result, the equity nature of fund interests implies that potential losses are only borne by LP investors and will not propagate throughout financial markets through the credit channel or other counterparty relationships.

Taking into consideration the intent of Congress, the SEC is “sensitive” to the ben-

¹This part is largely based on the SEC’s Proposing Release of new registration exemption rules to private funds. Release No. IA-3111; File No. S7-37-10

efits and costs of the rule imposed by venture capital exemption. With more restrictive exemption criteria, the increased regulatory oversight of private fund advisers would reduce systemic risk and increase market transparency, which in turn benefits investors through more efficient capital allocation. Potential costs include on-going compliance costs, which might be prohibitive to small advisers, potential change in the fund structure and operation for advisers that seek to meet the criteria of venture fund exemption, and reduced flexibility to accommodate unknown or unanticipated future practices in venture capital investing.

A.2 Debates on the Definition of Venture Capital Funds

In light of Congress' intended scope of venture capital exemption, the SEC's new rule 203(1)-1 defines a venture capital fund as:

“[a] private fund that (i) holds no more than 20 percent of the fund's capital commitments in non-qualifying investments [...]; (ii) does not borrow or otherwise incur leverage, other than limited short-term borrowing [...]; (iii) does not offer its investors redemption or other similar liquidity rights except in extraordinary circumstances; (iv) represents itself as pursuing a venture capital strategy to its investors and prospective investors; and (v) is not registered under the Investment Company Act and has not elected to be treated as a business development company.”

in which a qualifying investment is defined as:

“(i) any equity security² issued by a qualifying portfolio company³ that is directly acquired by the private fund from the company (“directly acquired equity”); (ii) any equity security issued by a qualifying portfolio company in exchange for directly acquired equity issued by the same qualifying portfolio company; and (iii) any equity security issued by a company of which a qualifying portfolio company is a majority-owned subsidiary, or a predecessor,

²An equity security is defined by reference to the Securities Exchange Act of 1934 and includes common stock, preferred stock as well as warrants and other securities convertible into common stock in addition to limited partnership interests.

³Under rule 203(1)-1, a qualifying portfolio company is defined as “any company that: (i) is not a reporting or foreign traded company and does not have a control relationship with a reporting or foreign traded company; (ii) does not incur leverage in connection with the investment by the private fund and distribute the proceeds of any such borrowing to the private fund in exchange for the private fund investment; and (iii) is not itself a fund (*i.e.*, is an operating company).”

and that is acquired by the fund in exchange for directly acquired equity.”

However, the SEC pointed out the difficulty in defining a VC fund in a way that balances Congress’ intended scope of exemption and various views of the VC community. The SEC received over 70 comment letters in response to the proposed definition from industry groups such as VC fund advisers, their law firms, and the National Venture Capital Association (NVCA).⁴ For example, much of the debate centers around the size of non-qualifying investments basket among different industry groups, the SEC and Congress. Some commenters expressed support for a larger basket size emphasizing the need for greater flexibility in taking advantage of investment opportunities such as non-convertible bridge loans of portfolio companies,⁵ interests in other pooled investment funds,⁶ and publicly offered securities.⁷ Although the SEC considered adopting a 40% basket for non-qualifying investments by analogy to the Investment Advisers Act definition of business development companies, the final 20% basket was established by Congress.

With respect to financial leverage, a VC fund under rule 203(1)-1 must not incur debt including guarantees of portfolio company debt in excess of 15% of the fund’s capital contributions and uncalled committed capital. Many commenters sought to broaden the leverage criterion by excluding the 15% leverage limitation on capital call lines of credit⁸ or borrowing by a VC fund in order to meet fee and expense obligations⁹ or expanding the limit,¹⁰ etc. However, the SEC believes that a relative lack of leverage is one of the major reasons for Congress to exempt VC fund advisers and an alternative approach to fund leverage will not address Congress’ concerns about potential systemic risks created by financial leverage.

⁴The SEC’s Proposing Release spends almost 70 pages to define a venture capital fund and discuss concerns raised by commenters. The details are beyond the scope of this paper.

⁵See, e.g., Comment Letter of CounselWorks LLC (Jan. 24, 2011); ESP Letter; Comment Letter of McGuireWoods LLP (Jan. 24, 2011) (“McGuireWoods Letter”); NVCA Letter; Oak Investment Letter. See also BioVentures Letter (supported venture capital fund investments in non-convertible debt without a time limit); Cook Children’s Letter; Leland Fikes Letter (each of which expressed general support). One commenter indicated that the proposed condition limiting investments in portfolio companies to equity securities was too narrow. See Pine Brook Letter.

⁶See, e.g., Cook Children’s Letter; Leland Fikes Letter; PEI Funds Letter; Comment Letter of SVB Financial Group (Jan. 24, 2011) (“SVB Letter”).

⁷See, e.g., ATV Letter; BIO Letter (noted that investments by venture capital funds in “PIPEs” (i.e., “private investments in public equity”) are “common”).

⁸Cook Children’s Letter; Leland Fikes Letter; SVB Letter.

⁹Dechert General Letter

¹⁰See Charles River Letter (argued that a qualifying fund should be able to borrow, without limit on duration, up to 20% of capital commitments with the consent of its investors).

Moreover, some commenters favored the California definition of “venture capital operating company”,¹¹ which generally requires a fund to have at least 50% of its portfolio investments in operating companies that provide it with “sufficient” management rights. But such a definition was considered too broad to be consistent with Congress’ intended scope of exemption because it potentially includes many other types of PE funds.

The SEC also considered defining a qualifying VC fund as one that invests in small companies, as proposed by several commenters.¹² However, the SEC eventually gave up this alternative due to a lack of consensus on the definition of “small companies” and worries of potential negative impacts of applying a single standardized metric. For example, various definitions were proposed based on reference to the Small Business Investment Act, size of public float or EBITDA, which may be too simple to take into account the complex heterogeneity across industries and regions. As a result, the SEC believed that applying a simple metric would inadvertently restrict venture capital supply to otherwise promising young small companies.

¹¹Comment Letter of Lowenstein Sandler PC (Jan. 4, 2011) (“Lowenstein Letter”); Comment Letter of Keith Bishop (Jan. 17, 2011).

¹²*See, e.g.*, Comment Letter of National Association of Small Business Investment Companies and Small Business Investor Alliance (Jan. 24, 2011) (“NASBIC/SBIA Letter”); Quaker BioVentures Letter (Jan. 24, 2011); Comment Letter of Venrock (Jan. 23, 2011)

B Variable Definitions and Construction

B.1 Variable Definitions

Variable Name	Definition
Panel A: GP-Year Level	
<i>Registered</i>	An indicator variable equal to one if the GP is registered with the SEC in a given year, and zero otherwise
<i>Regulatory Action</i>	An indicator variable equal to one if the GP receives regulatory disciplinary actions in the year, and zero otherwise
<i>Censure</i>	An indicator variable equal to one if the GP is sentenced to censure in the year, and zero otherwise
<i>Disgorgement/Restitution</i>	An indicator variable equal to one if the GP is sentenced to disgorgement or restitution in the year, and zero otherwise
<i>Cease and Desist</i>	An indicator variable equal to one if the GP receives a cease and desist order in the year, and zero otherwise
<i>Monetary Sanction</i>	An indicator variable equal to one if the GP receives monetary sanction in the year, and zero otherwise
<i>Ln(1 + Fine Amount)</i>	Natural logarithm of the fine amount in USD MIL
<i>Ln(GP Size)</i>	Natural logarithm of the amount of capital in USD MIL raised by PE funds managed by the adviser in the past 10 years
<i>Number of Funds Raised</i>	Number of PE funds raised by the GP in the past 10 years
<i>Buyout</i>	An indicator variable equal to one if the GP manages buyout funds, and zero otherwise
<i>Fundraising</i>	An indicator variable equal to one if the GP raises a PE fund in the year, and zero otherwise
<i>Number of Funds Raised</i>	Number of PE funds raised by the GP in a given year
<i>Ln(1 + Raised Capital)</i>	Natural logarithm of one plus the total amount of PE funds raised in USD MIL in a given year
<i>Co-investment Fund</i>	An indicator variable equal to one if the GP raises a co-investment fund in the year, and zero otherwise.
<i>Number of Co-Investment Funds</i>	Number of co-investment funds raised by the GP in a given year.
<i>Ln(1 + Co-investment Fund Size)</i>	Natural logarithm of one plus the total amount of co-investment funds raised in USD MIL in a given year.
<i>Size Group</i>	A variable ranging from 1 to 5 that ranks a GP in quintile groups based the total amount of PE funds raised in the past ten years as of 2011, the year before the Dodd-Frank Act becomes effective. A value of 5 indicate the group of the largest size.
<i>Buyout Manager</i>	An indicator variable equal to one if the GP manages any buyout funds in the past 10 years as of 2011
<i>Post</i>	An indicator variable equal to one if the year is or after 2012, the effective year of the Dodd-Frank Act which brings PE fund advisers under the SEC's scrutiny, and zero otherwise
Panel B: LP-Year Level	
<i>Capital Commitment</i>	An indicator variable equal to one if the LP commits capital to any PE funds in the year, and zero otherwise

<i>Number of Funds</i>	Number of PE funds the LP committed capital to in one year
<i>Ln(1 + Committed Capital)</i>	Natural logarithm of one plus the amount of capital in USD MIL committed to PE funds in one year. For LP-GP relationships with missing committed capital, I impute the value with the mean value of other LPs' committed capital at the same fund level.
<i>Direct Investment</i>	An indicator variable equal to one if the LP makes direct investments in private companies in the year, and zero otherwise
<i>Number of Direct Investments</i>	Number of direct investments in private companies made by the LP in one year
<i>Ln(1 + Direct Investment Amount)</i>	Natural logarithm of one plus the amount of direct investments in USD MIL made by the LP in one year
<i>Direct Investment</i>	An indicator variable equal to one if the LP makes direct investments in private companies in the year, and zero otherwise
<i>Regulatory Exposure</i>	An indicator variable equal to one if the share of newly registered GPs in the LP's pre-existing LP-GP relationships is in the top quintile group, and zero otherwise
<i>Post</i>	An indicator variable equal to one if the year is or after 2012, the effective year of the Dodd-Frank Act which brings PE fund advisers under the SEC's scrutiny, and zero otherwise
<i>Ln(LP Size)</i>	Natural logarithm of the capital committed to PE funds along with the direct investments made by an LP in the past 10 years
<i>Misconduct Exposure</i>	An indicator variable equal to one if there is any GP with regulatory misconduct as of the effective year of the Dodd-Frank Act in the LP's pre-existing LP-GP relationships, and zero otherwise.
<i>Panel C: Private Equity Deal Level</i>	
<i>LP Ratio (%)</i>	Percentage of PE investors that are limited partners in a deal
<i>Early Stage</i>	An indicator variable equal to one if the deal is a venture capital deal with a round number below Series C, and zero otherwise
<i>Company Age</i>	Age of the company in years
<i>Round Number</i>	Number of the funding round
<i>Ln(Capital Raised)</i>	Natural logarithm of one plus the total amount of capital in USD MIL that the company has raised
<i>Ln(Capital Raised)</i>	Natural logarithm of the total amount of capital in USD MIL that the company has raised
<i>Number of Highly Cited Patents / Deal Size</i>	Number of (eventually granted) highly cited patents applied for in the next three years, scaled by the deal size. Highly cited patents are defined as those with the top quintile numbers of citations among patents granted in the same year
<i>IPO</i>	An indicator variable equal to one if the company goes public by the end of 2021, and zero otherwise
<i>Successful Exit</i>	An indicator variable equal to one if the company goes public or is acquired with a valuation two times or greater than invested capital, and zero otherwise
<i>Years to Exit</i>	Number of years from first PE financing to exit and is missing if there is no exit

<i>Ln(Exit Value)</i>	Natural logarithm of the exit valuation for companies that go public or are acquired
<i>Direct Investment</i>	An indicator variable equal to one if the PE deal is directly invested by LP investors, and zero otherwise
<i>Panel D: Public Pension Fund Level</i>	
<i>Ln(Actuarial Assets)</i>	Natural logarithm of average actuarial assets in USD MIL between 2001 and 2011
<i>Ln(Payroll)</i>	Natural logarithm of average covered payroll in USD MIL between 2001 and 2011
<i>Funded Ratio</i>	Average plan assets divided by actuarial accrual liabilities between 2001 and 2011
<i>Benefit Cost Ratio</i>	Average total contribution to total benefits between 2001 and 2011
<i>Assumed Inflation</i>	Average assumed inflation in percentage points between 2001 and 2011
<i>Assumed Investment Return</i>	Average assumed investment return in percentage points between 2001 and 2011
<i>Assumed Payroll Growth</i>	Average assumed payroll growth rate in percentage points between 2001 and 2011
<i>TRS</i>	An indicator variable equal to one if the pension plan type is teachers' retirement system (TRS), and zero otherwise
<i>PFSRS</i>	An indicator variable equal to one if the pension plan type is police/fire, firefighter, or public safety retirement system (PFSRS), and zero otherwise
<i>1-year Investment Return</i>	Average 1-year investment return in percentage points between 2001 and 2011
<i>5-year Investment Return</i>	Average 5-year investment return in percentage points between 2001 and 2011
<i>10-year Investment Return</i>	Average 10-year investment return in percentage points between 2001 and 2011
<i>Actual Equity Allocation</i>	Average actual equity allocation in percentage points between 2001 and 2011
<i>Target Equity Allocation</i>	Average target equity allocation in percentage points between 2001 and 2011
<i>Equity Return</i>	Average equity return in percentage points between 2001 and 2011
<i>Actual Private Equity Allocation</i>	Average actual private equity allocation in percentage points between 2001 and 2011
<i>Target Private Equity Allocation</i>	Average target private equity allocation in percentage points between 2001 and 2011
<i>Private Equity Return</i>	Average private equity return in percentage points between 2001 and 2011
<i>Actual Fixed Income Allocation</i>	Average actual fixed income allocation in percentage points between 2001 and 2011
<i>Target Fixed Income Allocation</i>	Average target fixed income allocation in percentage points between 2001 and 2011
<i>Fixed Income Return</i>	Average fixed income return in percentage points between 2001 and 2011

B.2 Matching Preqin and Form ADV Filings

I manually match GP names from Preqin with investment adviser names in Form ADV filings by searching the Investment Adviser Public Disclosure (IAPD) database (<https://adviserinfo.sec.gov>). The IAPD is sponsored by the SEC and allows users to search for Form ADV filings of investment advisers regardless of their registration status with the SEC.

I search each name of my sample GPs in the IAPD, which returns potential matches with similar adviser names. Then I manually identify and validate the matches by cross-checking the addresses reported in the advisers' Form ADV filings and those shown on their official websites or PitchBook. This process allows me to create a linking table between the GPs' identifiers in Preqin and their latest SEC file numbers/Central Registration Depository (CRD) number in the Form ADV filings for data merging.

While each GP has a unique identifier in Preqin, it's important to note that a single GP may have multiple SEC file numbers due to factors like operating through multiple subsidiaries or undergoing changes in registration status. For example, Bain Capital has multiple subsidiaries such as Bain Capital Private Equity, LP (SEC file number 801-69069) and Bain Capital Ventures, LP (SEC file number 801-69071). Another example is Sequoia Capital Operations, LLC which changed its SEC file number from 802-75992 to 801-122957.¹³ This change occurred as Sequoia Capital restructured itself around an open-ended fund and began holding assets like cryptocurrencies, leading it to no longer qualify for the venture capital exemption under Title IV of the Dodd-Frank Act.¹⁴

I use the CRD number (item 1e) combined with SEC file number (item 1d) and adviser names (item 1a) to track the same investment advisers across ADV filings. While the CRD number is unique for an investment adviser firm and does not change over time, even if the firm undergoes mergers, name changes, or other structural adjustments, sometimes advisers do not enter CRD numbers. In such cases, the SEC file number serves as a reliable alternative,

¹³The SEC file number starts with "801" for registered advisers and with "802" for exempt reporting advisers.

¹⁴See "The Sequoia Capital Fund: Patient Capital for Building Enduring Companies", October 26, 2021.

as it is almost always reported and stays consistent unless the adviser switches registration status (e.g., from unregistered to SEC-registered). In the case of registration status change and missing CRD numbers after/before the registration, I use firm legal names to track the same adviser that experience registration change and stop/start reporting CRD number after such change.¹⁵ This multi-identifier approach allows for consistent matching of advisers despite reporting gaps or structural changes.

¹⁵For example, Andreessen Horowitz reported its CRD number (160489) since its first ADV filing in March 2012 and stopped reporting the CRD number after March 2017. It became a SEC-registered adviser in March 2019, changing its SEC file number from 802-75605 to 801-114985. Relying on CRD and SEC file numbers will not be sufficient to identify the same adviser’s filings over time. However, using the adviser name (AH CAPITAL MANAGEMENT, L.L.C.) will ensure continuity in tracking its Form ADV filings. I avoid depending primarily on adviser names due to occasional inconsistencies in their reporting (e.g., minor variations like “ABC Capital, LLC” vs. “ABC Capital Management L.L.C.” or potential typos).

C Additional Figures and Tables

C.1 Limited Change in Fundraising Characteristics

Due to the private adviser exemption discussed in Section 2.2, advisers can remain unregistered by keeping their assets under management (AUM) below \$150 USD MIL. This exemption is the only available option if they manage any buyout funds. If buyout fund advisers were to strategically avoid registrations, they would have to manage very small funds. However, there has been a rather limited increase in the number of small buyout funds following the reform.¹⁶ This observation is evident in the cross-sectional size distributions of buyout funds raised before and after the intervention year as shown in Figure C.3a.

Advisers can also stay unregistered if they meet the venture capital exemption, by exclusively managing VC funds that meet the SEC’s regulatory definition. Figure C.3b illustrates the time-series evolution of the percentage of PE funds that fall under the category of VC funds.¹⁷ The lack of immediate and large increase in the share of VC funds suggests that advisers do not abuse venture capital exemption.

Overall, complementary to the limited long-run change in the share of advisers by registration exemption (Section 4.2), the fundraising patterns suggests that advisers have limited ability to systematically change their fundraising characteristics to qualify for the new registration exemptions.

C.2 Potential Selection into Newly Registered GPs among Public Pensions

LP investors in private equity markets include diverse institutional investors such as pension funds, endowments, and insurance companies. While commercial PE databases offer only basic information, including institutional type, location, founding year, and historical fund investments, these data sources do not provide consolidated panel data about different LPs’ financial positions and other characteristic, which can be helpful in investigation potential selection in my research design. I overcome this challenge by zooming into public pensions

¹⁶I use fund size as a proxy for adviser size because AUM is not observable before the Dodd-Frank Act.

¹⁷I use both broad and narrow definitions of VC funds because many PE funds that invest in high-growth start-ups do not necessarily meet the SEC’s regulatory definition of a VC fund. I assume funds within the narrow definition are more likely to meet the regulatory definition used for the venture capital exemption. The narrow definition includes funds classified as early stage and venture (general) by Preqin. The broad definition adds funds classified as expansion / late stage, growth, and balanced by Preqin. See Appendix A for a detailed discussion of the SEC’s regulatory definition.

and augmenting the Prequin data with comprehensive information from the Public Plan Database (PPD), covering over 250 major US state and local pension funds. The data supplements my analysis in Section 5.1.3 and further assess potential selection into newly registered GPs among public pensions, one of the most important and largest LPs.

Specifically, I estimate linear probability models to examine whether key pre-Dodd-Frank-Act characteristics, such as pension size, financial health, investment assumptions, type, investment returns as well as asset allocation, predict a public pension’s probability of having high exposure to newly registered GPs in their pre-existing relationships. The full sample includes a cross-section of 164 unique public pension funds. As Table C.2 shows, all coefficient estimates across Columns (1)-(5) are statistically insignificant, providing further evidence against endogenous matching concerns in my difference-in-differences design, even though some of these characteristics do predict a pension’s GP matching outcome, such as the probability of having a large number of pre-existing relationships in Columns (6)-(10). Table C.4 Panel C shows that my main results remain qualitatively and quantitatively similar when restricting the DiD analysis to public pension funds in my sample.

C.3 A Lack of Differential Trends across GPs

Since the new registration exemptions under the Dodd-Frank Act are tied to GP size and investment strategy, one potential concern is that the effects documented in my main tables are confounded by differential trends in investment opportunities and market dynamics between small and large GPs or between GPs that manage buyout funds or only VC funds. Table 7 Panel A addresses this concern by allowing LP outcomes to evolve on flexible time trends across LPs with different exposure to these GPs. To further rule out this confounding factor, I directly test whether these GPs face differential fundraising outcomes by estimating the following regression:

$$Fundraising_{jt} = \beta \times GP\ Characteristics_j \times Post_t + \delta_j + \tau_t + \epsilon_{jt} \quad (4)$$

in which j and t denote a GP and a year, respectively. *Size Group* is a variable ranging from 1 to 5 that ranks a GP in quintile groups based the total amount of PE funds raised in the past ten years as of 2011, the year before the Dodd-Frank Act becomes effective. A value of

5 indicate the group of the largest size. *Buyout Manager* is an indicator variable equal to one if the GP manages any buyout funds in the past 10 years as of 2011. *Post* is an indicator variable equal to one if the year is or after 2012, the effective year of the Dodd-Frank Act which brings PE fund advisers under the SEC’s scrutiny, and zero otherwise. δ_j and τ_t are GP and year fixed effects. Appendix B.1 provides detailed variable definitions. Standard errors are clustered at the GP level.

If the effects of registration documented in Table 4 is driven by the secular trends across GPs, then β in Equation (4) should be statistically positive. This explanation is unsupported by the β coefficient estimates shown in Table C.3. The coefficients are not meaningfully different from zero in terms of magnitude and also mostly statistically insignificant.

To highlight the effect of registration, Table C.3 also reports OLS estimates of fundraising outcomes on *Registered*, an indicator variable equal to one if the GP is registered with the SEC in a given year, and zero otherwise, which has within-GP variation due to change in a GP’s registration status—mainly in 2012 (Figure C.1). In contrast to the coefficient estimates of *Size Group* \times *Post* and *Buyout Manager* \times *Post*, *Registered* are positive with economically large magnitude at the 1% significance level. The finding provides further evidence that the effects documented in my main tables are indeed driven by registration instead of secular trends across GPs with different size or investment strategy.

One might wonder why exempt GPs do not choose to register if registration enhances fundraising. First, operating as an exempt reporting adviser provides greater flexibility in operations and investment strategies, whereas SEC registration imposes restrictions on areas such as fees, expenses, marketing, and custody rules. Second, SEC registration requires the disclosure of sensitive information, including detailed business practices and financial data, which some PE fund advisers may prefer to avoid to protect proprietary information and maintain confidentiality (Abuzov, Gornall, and Strebulae, 2025). Third, the costs of SEC registration—such as legal, compliance, and administrative expenses—can be substantial, particularly for smaller or mid-sized advisers.

C.4 Adverse Selection in Direct Investments

While LPs tend to invest in mature and large companies, such deals are presumably the most subject to adverse selection – the very best deals will be oversubscribed and syndicated to

investors within the GP networks rather than invested by LP investors which tend to have weaker deal origination. As a result, those companies that LPs have a greater chance to directly invest in might have lower quality. Similar adverse selection in co-investments has been studied by [Fang, Ivashina, and Lerner \(2015\)](#) and [Braun, Jenkinson, and Schemmerl \(2020\)](#), who examine whether PE fund advisers offer worse co-investment opportunities to their LP investors and find inconclusive results.

This paper does not find evidence of adverse selection in LP investors' direct investments based on the exit outcomes of the propensity-score-matched sample of PE deals in the US. According to results reported in Table 8, deals participated by LPs are very different from those invested by GPs. To create a proper benchmark, I construct a control group by matching each LP's direct investment with another deal with similar observable deal characteristics but no LP investors. Table C.8 Panel A reports the OLS estimates of exit outcomes, in which the variable of interest *Direct Investment* is an indicator variable equal to one if the deal is directly invested by LP investors and zero otherwise. The coefficient estimates are highly insignificant across all columns - providing little support for adverse selection into companies with worse exit outcomes measured either by the probability of having a successful exit through IPO or acquisitions, time to exit, and exit valuation. Panel B shows balanced covariates after the propensity score matching - the standardized differences of observable characteristics between LP-invested companies and those without LPs' direct investments are almost reduced to zero and the variance ratios become closer to one after the matching.

One caveat is that a lack of differences in company exit outcomes does not necessarily suggest LPs can earn similar net returns in their direct investments compared to their fund investments. To properly measure LP's return in company exits, we will need to observe the ownership stake at the IPO or M&A, which is unobservable in my data. Using proprietary data of deal-level cash flow provided by some large institutions, [Fang, Ivashina, and Lerner \(2015\)](#) show that LPs' direct investments tend to outperform their fund benchmark, especially when LPs can more easily overcome information frictions in direct investing.

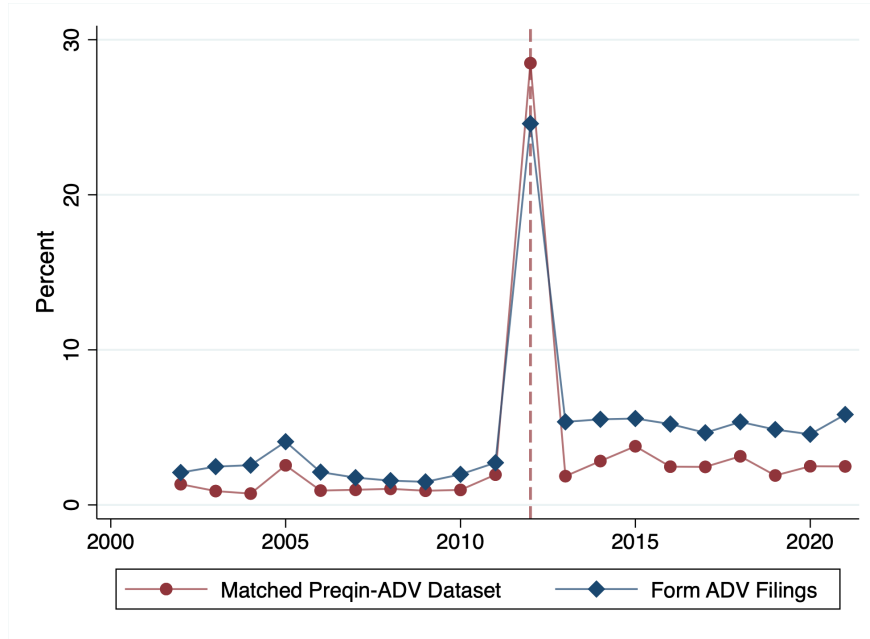
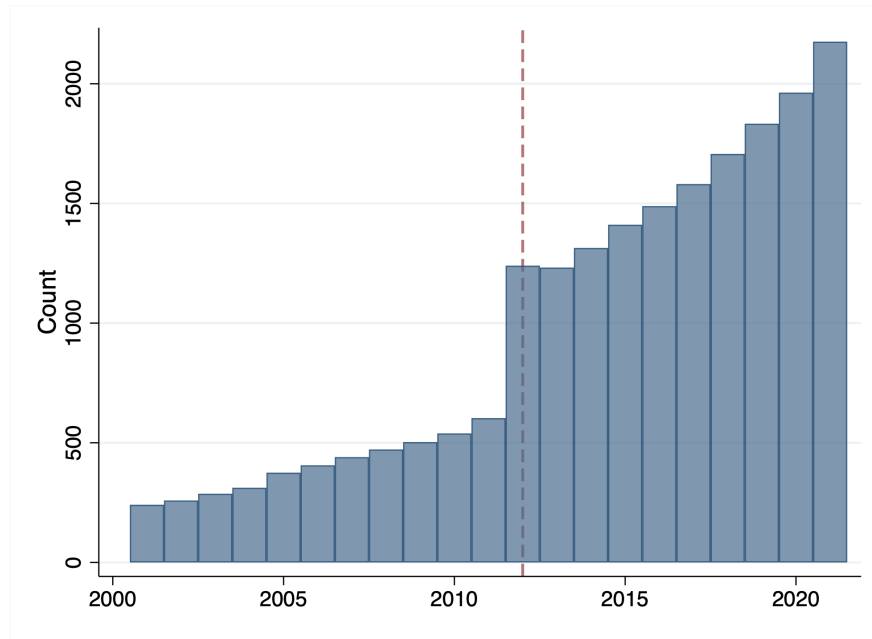
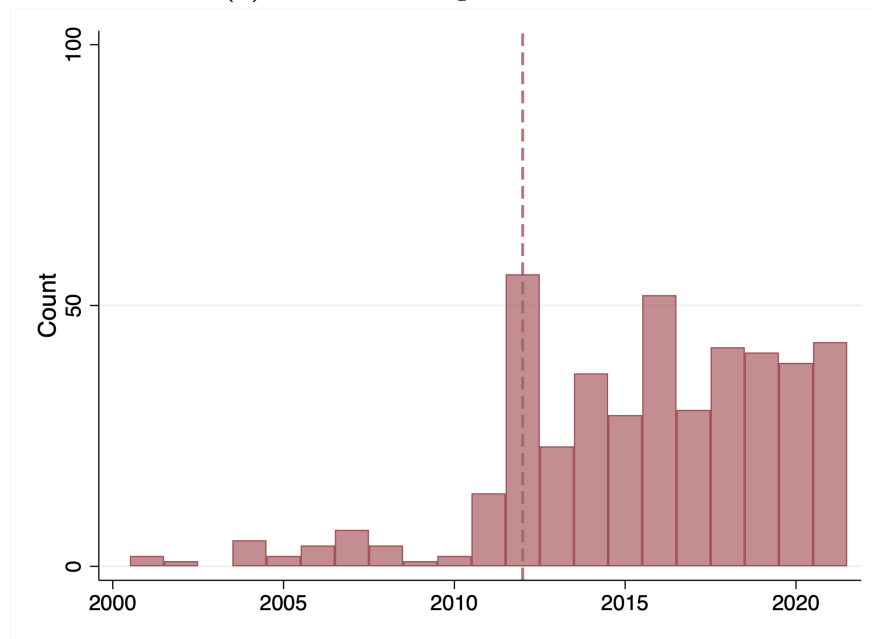


Figure C.1: Data Validation - Share of Newly Registered Advisers

This figure compares the share of newly registered PE fund advisers as a percentage of all advisers in the manually matched Preqin-ADV dataset with the share solely based on Form ADV filings. To identify these GPs in Preqin, I manually match Preqin with Form ADV filings by searching the Investment Adviser Public Disclosure database based on GP names. Appendix B.2 provides details about the matching procedure. The share in the matched Preqin-ADV database closely aligns with the share solely based on Form ADV filings (correlation = 0.98), validating the matching quality. The sample GP in the matched Preqin-ADV database consists of GPs with observed LP relationships. The main identification strategy in this paper relies on the GPs that become newly registered in 2012, indicated by the vertical red dashed line, when the Dodd-Frank Act becomes effective to PE fund advisers.



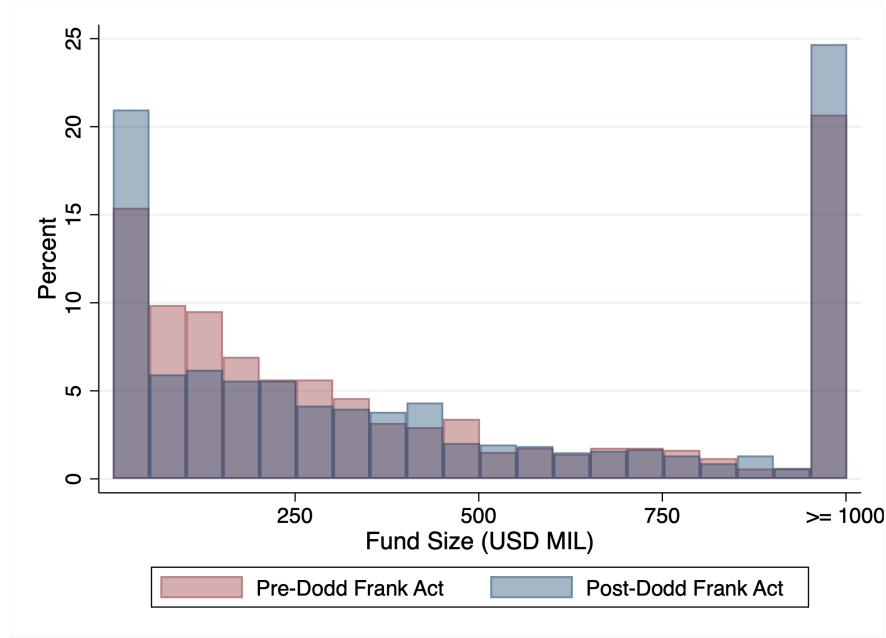
(a) Number of Registered Advisers



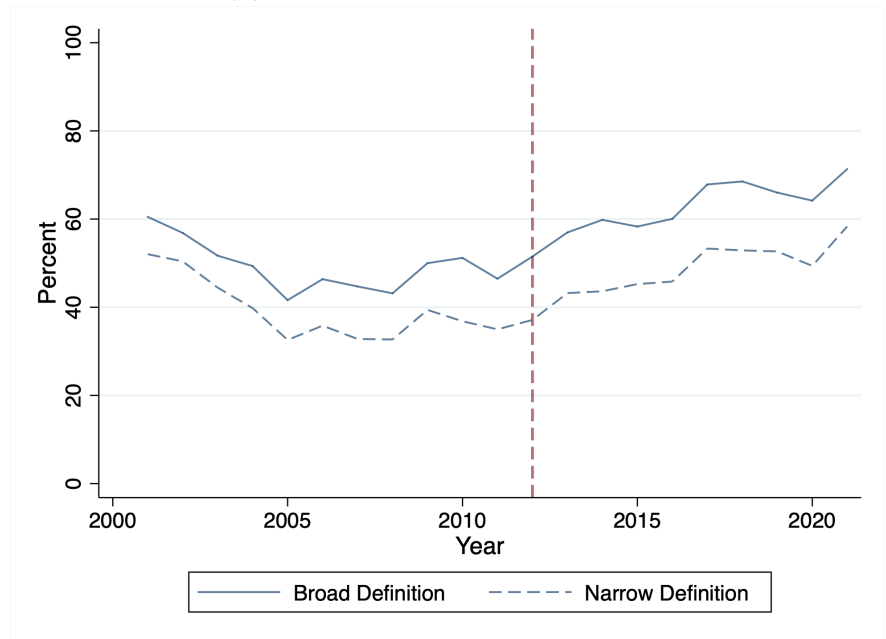
(b) Number of SEC Registration Withdrawal by Active Advisers

Figure C.2: Number of Registered PE Advisers vs. Number of Active De-registrations

Figure C.2a shows the number of PE fund advisers that are registered with the SEC from 2001-2021. Figure C.2b indicates the number of SEC de-registration by advisers that meet the old (new) registration exemptions before (after) the Dodd-Frank Act. The number of active de-registrations is small compared to the number of registered advisers in a given year. The de-registration data is collected from Form ADV-W, regulatory filings that must be submitted by advisers when they withdraw their registrations from the SEC. The red vertical dashed line indicates 2012 when the Dodd-Frank Act became effective and significantly narrowed PE fund advisers' registration exemptions.



(a) Buyout Fund Size Distribution



(b) Time Series Evolution of Venture Capital Fundraising

Figure C.3: Aggregate Fundraising Characteristics Before and After the Dodd-Frank Act

Figure C.3a shows the cross-sectional size distribution of buyout funds raised before and after the effective year of the Dodd-Frank Act. Figure C.3b illustrates the time-series evolution of the percentage of PE funds classified as venture capital (VC) funds. Both figures indicate limited aggregate changes in PE fund characteristics across advisers around the reform. These characteristics are determinants of the new registration exemptions under the Dodd-Frank Act. The solid line uses a broad definition including funds classified as early stage, expansion / late stage, venture (general), growth, and balanced funds by Preqin. The dashed line uses a narrow definition including funds classified as early stage and venture (general) funds by Preqin. The red vertical dashed line indicates the base year 2011, the year before the Dodd-Frank Act significantly narrowed PE fund advisers' registration exemptions.

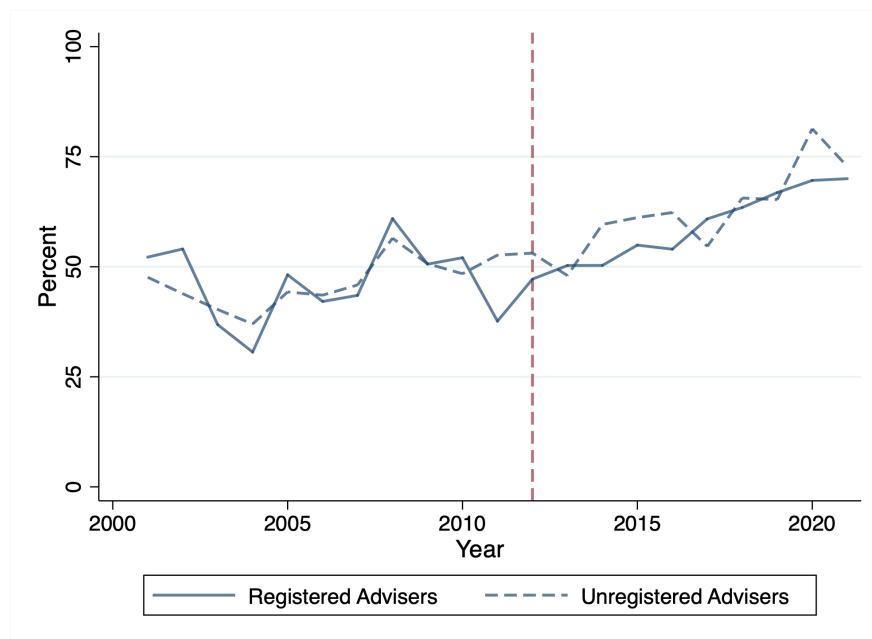


Figure C.4: Percent of Returning LPs

This figure shows the average percentage of returning LPs in PE funds managed by registered and unregistered advisers. Returning LPs are defined as LPs that have previous investments in funds managed by the adviser. The red vertical dashed line indicates the base 2012 when the Dodd-Frank Act became effective for PE fund advisers and significantly narrowed their registration exemptions from the SEC.

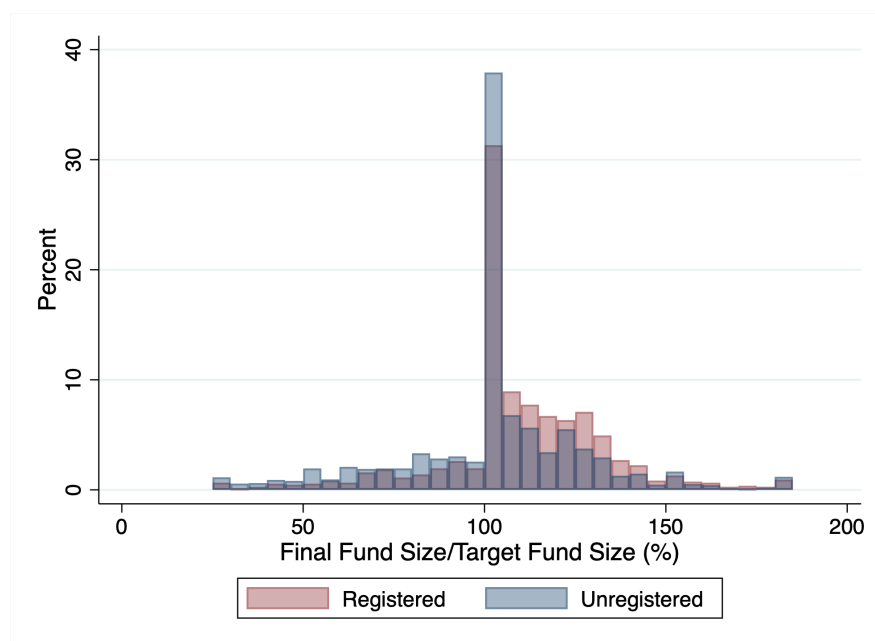


Figure C.5: Subscription Ratio of Private Equity Funds

This figure shows the subscription ratio of funds raised by registered and unregistered advisers. The subscription ratio is defined as the ratio of the final fund size to the target fund size. Around 60% of funds managed by registered advisers are oversubscribed, but only 42% of funds managed by unregistered advisers are oversubscribed. The difference in subscription ratio between registered and unregistered GPs is statistically significant at the 1% level in a multivariate regression that accounts for different fund characteristics, such as fund type, sequence number, and vintage year.

Table C.1: Top Private Equity Fund Advisers Initially Registered in 2012

This table provides the top PE fund advisers initially registered with the SEC in 2012 after the Dodd-Frank Act became effective for PE funds. The ranking is based on the total gross asset value of PE funds reported by the advisers in their Form ADV filings in 2012.

	Adviser Name	Gross Asset Value (USD MIL)
1	Warburg Pincus LLC	33,177
2	Hellman & Friedman LLC	20,685
3	Leonard Green & Partners, LP	15,385
4	First Reserve Management, LP	14,294
5	Madison Dearborn Partners, LLC	13,878
6	Clayton, Dubilier & Rice, LLC	13,725
7	Silver Lake Technology Management, LLC	13,110
8	TA Associates Management, LP	10,631
9	Centerbridge Partners, LP	8,859
10	American Securities LLC	8,857
11	WCAS Management Corporation	8,392
12	H.I.G. Capital, LLC	8,300
13	THL Managers VI, LLC	8,276
14	Stone Point Capital LLC	8,273
15	Kelso & Company, LP	8,245
16	Sun Capital Advisors, Inc.	8,172
17	Arclight Capital Partners, LLC	7,954
18	Golden Gate Private Equity Inc.	7,274
19	Tiger Global Management, LLC	7,211
20	Onex Partners Manager LP	7,209

Table C.2: Potential Selection into Newly Registered GPs among Public Pension Funds

This table reports cross-sectional regressions examining selection into newly registered advisers based on average pre-intervention (2001-2011) public pension fund characteristics covered in the Public Plan Database. The sample includes public pensions matched to the LP sample in the main analysis. *Regulatory Exposure* is an indicator variable equal to one if the share of newly registered GPs in the LP's pre-existing LP-GP relationships is in the top quintile group, and zero otherwise. *GP Relationships* is an indicator variable equal to one if the number of pre-existing relationships is in the top quintile group, and zero otherwise. The table suggests that these pension characteristics cannot predict selection into newly registered GPs but predicts the number of pre-existing GP relationships. The benchmark type for TRS and PFSRS pensions is Public Employees' Retirement System (PERS)/Employees' Retirement System (ERS). Detailed variable definitions are provided in Appendix B. Huber-White standard errors are reported in brackets. ***, ** and * indicate 1%, 5% and 10% significance level.

	Regulatory Exposure					GP Relationships				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Ln(Actuarial Assets)	-0.070 [0.053]				-0.021 [0.119]	0.046 [0.078]				0.102 [0.086]
Ln(Payroll)	0.050 [0.053]				-0.017 [0.140]	0.008 [0.079]				-0.122 [0.083]
Funded Ratio	-0.014 [0.139]				0.048 [0.410]	0.471** [0.190]				-0.163 [0.269]
Benefit Cost Ratio	-0.000 [0.000]				-0.012 [0.035]	0.001*** [0.000]				0.108*** [0.036]
Assumed Inflation (%)		3.278 [8.430]			-14.247 [14.495]		-0.696 [4.143]			1.324 [7.876]
Assumed Investment Return (%)		-14.719 [9.615]			-0.158 [14.675]		-3.725 [5.962]			-21.694 [14.374]
Assumed Payroll Growth (%)		-4.745 [4.165]			4.657 [11.079]		-5.390** [2.673]			-5.367 [8.167]
TRS (0/1)			0.000 [0.001]		-0.000 [0.001]			0.001 [0.001]		-0.001 [0.001]
PFSRS (0/1)			-0.001 [0.001]		-0.000 [0.002]			0.001 [0.001]		-0.003* [0.001]
1-year Investment Return (%)				0.026 [0.039]	0.015 [0.096]				-0.001 [0.047]	0.075 [0.098]
5-year Investment Return (%)				0.022 [0.048]	-0.014 [0.084]				0.065 [0.059]	-0.008 [0.071]
10-year Investment Return (%)				0.005 [0.022]	0.027 [0.038]				0.003 [0.027]	-0.012 [0.033]
Actual Equity Allocation (%)				0.004 [0.010]	0.024 [0.017]				0.017 [0.016]	0.002 [0.015]
Target Equity Allocation (%)				0.005 [0.008]	-0.011 [0.013]				0.005 [0.011]	0.014 [0.010]
Equity Return (%)				0.014 [0.018]	0.010 [0.042]				-0.041* [0.024]	-0.073** [0.028]
Actual Private Equity Allocation (%)				-0.016 [0.011]	-0.019 [0.022]				0.016 [0.011]	-0.009 [0.012]
Target Private Equity Allocation (%)				0.004 [0.011]	0.002 [0.028]				0.047*** [0.013]	0.046** [0.021]
Private Equity Return (%)				0.008 [0.007]	0.010 [0.012]				0.008 [0.007]	0.012 [0.009]
Actual Fixed Income Allocation (%)				0.006 [0.010]	0.009 [0.016]				0.009 [0.015]	-0.026* [0.014]
Target Fixed Income Allocation (%)				-0.007 [0.009]	-0.015 [0.019]				-0.003 [0.011]	0.018 [0.013]
Fixed Income Return (%)				0.006 [0.029]	0.047 [0.054]				0.061 [0.047]	0.066 [0.046]
Observations	164	100	164	108	70	164	100	164	108	70
Adjusted R^2	-0.007	0.001	-0.002	0.015	-0.190	0.108	-0.012	-0.003	0.294	0.134

Table C.3: Falsification Tests

As a falsification test for Table 7, this table shows within-GP regression estimates that rule out secular trends across GPs as an explanation for the LPs' PE market participation. The finding is consistent with Table 7 Panel A. *Size Group* is a variable ranging from 1 to 5 that ranks a GP in quintile groups based the total amount of PE funds raised in the past ten years as of 2011, the year before the Dodd-Frank Act becomes effective. A value of 5 indicate the group of the largest size. *Buyout Manager* is an indicator variable equal to one if the GP manages any buyout funds in the past 10 years as of 2011. *Post* is an indicator variable equal to one if the year is or after 2012, the effective year of the Dodd-Frank Act which brings PE fund advisers under the SEC's scrutiny, and zero otherwise. *Registered* is an indicator variable equal to one if the GP is registered with the SEC in a given year, and zero otherwise. Change in registration status leads to within-GP variation in *Registered*. *Fundraising* is an indicator variable equal to one if the GP raises a PE fund in the year, and zero otherwise. *Number of Funds Raised* is the number of PE funds raised by the GP in a given year. $\ln(1 + \text{Raised Capital})$ is the natural logarithm of one plus the total amount of PE funds raised in USD MIL in a given year. Detailed variable definitions are provided in Appendix B. Standard errors are clustered at the GP level and reported in brackets. ***, ** and * indicate 1%, 5% and 10% significance level.

	Fundraising			Number of Funds Raised			Ln(1 + Raised Amount)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Size Group \times Post	0.002 [0.005]			0.019** [0.009]			0.011 [0.028]		
Buyout Manager \times Post		0.010 [0.013]			-0.019 [0.023]			0.098 [0.075]	
Registered			0.030** [0.012]			0.051** [0.020]			0.238*** [0.064]
GP FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
Observations	14,964	14,964	14,964	14,964	14,964	14,964	14,964	14,964	14,964
Adjusted R^2	0.059	0.059	0.059	0.159	0.158	0.159	0.088	0.088	0.089

Table C.4: Subsamples of LPs

This table provides robustness checks by re-estimating Equation (2) with different subsamples of LPs. Panel A excludes bank LPs, which are directly affected by the Volcker Rule, a contemporaneous change with the Dodd-Frank Act preventing banks from holding private equity. Panel B restricts the sample to endowments and foundations, to mitigate concerns about confounding financial regulation around the Dodd-Frank Act. Endowments and foundations are less regulated than other LPs such as pensions, insurers, and banks because they do not guarantee benefits or take on public liabilities. Panel C restricts the sample to public pensions to supplement the analysis reported in Table C.2. The full sample consists of LP investors located in the US during the period 2001-2021. A unit of observation is an LP-year. *Capital Commitment* is an indicator variable equal to one if the LP commits capital to any PE funds in the year, and zero otherwise. *Number of Funds* is the number of PE funds the LP committed capital to in one year. $\ln(1 + \text{Committed Capital})$ is the natural logarithm of one plus the amount of capital in USD MIL committed to PE funds in one year. *Direct Investment* is an indicator variable equal to one if the LP makes direct investments in private companies in the year, and zero otherwise. *Number of Direct Investments* is the number of direct investments in private companies made by the LP in one year. $\ln(1 + \text{Direct Investment Amount})$ is the natural logarithm of one plus the amount of direct investments in USD MIL made by the LP in one year. *Regulatory Exposure* is an indicator variable equal to one if the share of newly registered GPs in the LP's pre-existing LP-GP relationships is in the top quintile group, and zero otherwise. *Post* is an indicator variable equal to one if the year is or after 2012, the effective year of the Dodd-Frank Act, and zero otherwise. Detailed variable definitions are provided in Appendix B. Standard errors are clustered at the LP level and reported in brackets. ***, ** and * indicate 1%, 5% and 10% significance level.

	Capital Commitment	Number of Funds	$\ln(1 +$ Committed Capital)	Direct Investment	Number of Direct Investments	$\ln(1 +$ Direct Investment Amount)
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Exclude Banks						
Regulatory Exposure \times Post	0.098*** [0.018]	0.317*** [0.070]	0.308*** [0.074]	-0.013* [0.007]	-0.067*** [0.025]	-0.033** [0.013]
Observations	29,124	29,124	29,124	29,124	29,124	29,124
Adjusted R^2	0.350	0.573	0.470	0.394	0.510	0.426
Panel B: Restrict to Endowments and Foundations						
Regulatory Exposure \times Post	0.104*** [0.020]	0.209*** [0.052]	0.357*** [0.073]	-0.021*** [0.006]	-0.031*** [0.009]	-0.030*** [0.007]
Observations	11,386	11,386	11,386	11,386	11,386	11,386
Adjusted R^2	0.262	0.494	0.306	0.156	0.165	0.120
Panel C: Restrict to Public Pension Funds						
Regulatory Exposure \times Post	0.163*** [0.054]	0.652** [0.297]	0.464* [0.245]	0.003 [0.007]	-0.045 [0.046]	0.024 [0.018]
Observations	3,849	3,849	3,849	3,849	3,849	3,849
Adjusted R^2	0.472	0.667	0.682	0.405	0.150	0.181
LP FE	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓

Table C.5: Rule out Supply Side Explanations - Registration and Co-investment Funds

This table shows that registered advisers are more likely to raise co-investment funds. *Registered* is an indicator variable equal to one if the GP is registered with the SEC in a given year, and zero otherwise. Change in registration status leads to within-GP variation in *Registered*. *Co-investment Fund* is an indicator variable equal to one if the GP raises a co-investment fund in the year, and zero otherwise. *Number of Co-Investment Funds* is the number of co-investment funds raised by the GP in a given year. *Ln(1 + Co-investment Fund Size)* is the natural logarithm of one plus the total amount of co-investment funds raised in USD MIL in a given year. Detailed variable definitions are provided in Appendix B. Standard errors are clustered at the GP level and reported in brackets. ***, ** and * indicate 1%, 5% and 10% significance level.

	Co-investment Fund		Number of Co-investment Funds		Ln(1 + Co-investment Fund Size)	
	(1)	(2)	(3)	(4)	(5)	(6)
Registered	0.035*** [0.005]	0.023*** [0.005]	0.048*** [0.008]	0.031*** [0.011]	0.110*** [0.019]	0.078*** [0.019]
GP State FE	✓		✓		✓	
GP FE		✓		✓		✓
Year FE	✓	✓	✓	✓	✓	✓
Observations	19,277	19,295	19,277	19,295	19,277	19,295
Adjusted R^2	0.027	0.134	0.024	0.145	0.011	0.095

Table C.6: Rule out Supply Side Explanations - Venture Capital Market Participation

This table provides robustness checks by restricting to the venture capital market and re-estimating Equation (2). The new size-based exemption under the Dodd-Frank Act does not create incentives that distort GPs' VC fund size (see Section 2.2). The sample consists of LP investors located in the US during the period 2001-2021. A unit of observation is an LP-year. *Capital Commitment* is an indicator variable equal to one if the LP commits capital to any PE funds in the year, and zero otherwise. *Number of Funds* is the number of PE funds the LP committed capital to in one year. $\ln(1 + \text{Committed Capital})$ is the natural logarithm of one plus the amount of capital in USD MIL committed to PE funds in one year. *Direct Investment* is an indicator variable equal to one if the LP makes direct investments in private companies in the year, and zero otherwise. *Number of Direct Investments* is the number of direct investments in private companies made by the LP in one year. $\ln(1 + \text{Direct Investment Amount})$ is the natural logarithm of one plus the amount of direct investments in USD MIL made by the LP in one year. *Regulatory Exposure* is an indicator variable equal to one if the share of newly registered GPs in the LP's pre-existing LP-GP relationships is in the top quintile group, and zero otherwise. *Post* is an indicator variable equal to one if the year is or after 2012, the effective year of the Dodd-Frank Act, and zero otherwise. Detailed variable definitions are provided in Appendix B. Standard errors are clustered at the LP level and reported in brackets. ***, ** and * indicate 1%, 5% and 10% significance level.

	Capital Commitment	Number of Funds	$\ln(1 +$ Committed Capital)	Direct Investment	Number of Direct Investments	$\ln(1 +$ Direct Investment Amount)
	(1)	(2)	(3)	(4)	(5)	(6)
Regulatory Exposure \times Post	0.114*** [0.012]	0.211*** [0.034]	0.292*** [0.042]	-0.014** [0.006]	-0.057** [0.023]	-0.034*** [0.012]
LP FE	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓
Observations	29,572	29,572	29,572	29,572	29,572	29,572
Adjusted R^2	0.349	0.486	0.432	0.379	0.547	0.473

Table C.7: Fund Reporting and Registration

This table shows that GPs do not become more likely to report their LPs or their commitments at the fund level after SEC registration. *Multiple LPs* is an indicator variable equal to one for a fund if multiple LPs are reported in Preqin, and zero otherwise. *Missing LPs* is an indicator variable equal to one if Preqin does not cover any LPs of a fund, and zero otherwise. *Missing Commitments* is an indicator variable equal to one if Preqin does not cover any LP commitments for a fund, and zero otherwise. *Registered* is an indicator variable equal to one if the GP is registered with the SEC in a given year, and zero otherwise. $\ln(\text{Fund Size})$ is the natural logarithm of final size in USD MIL of a fund. *Buyout* is an indicator variable equal to one if the fund is a buyout fund, and zero otherwise. Detailed variable definitions are provided in Appendix B. Standard errors are clustered at the LP level and reported in brackets. ***, ** and * indicate 1%, 5% and 10% significance level.

	(1)	(2)	(3)
	Multiple LPs	Missing LPs	Missing Commitments
Registered	0.015 [0.025]	-0.034 [0.024]	-0.036 [0.031]
$\ln(\text{Fund Size})$	0.147*** [0.008]	-0.151*** [0.007]	-0.136*** [0.008]
Fund Number	0.016*** [0.003]	-0.001 [0.003]	-0.008** [0.003]
Buyout	-0.019 [0.048]	0.123*** [0.042]	-0.047 [0.051]
GP FE	✓	✓	✓
Vintage FE	✓	✓	✓
Observations	3,907	3,907	3,907
Adjusted R^2	0.538	0.443	0.530
\bar{y}	0.638	0.230	0.435

Table C.8: Direct Investments and Adverse Selection

This table investigates whether investors face adverse selection of investment opportunities when making direct investments in private equity markets. The sample is constructed by finding the nearest neighbor match for each company invested directly by LPs using a propensity score matching procedure based on PE deals during the period 2001-2021. Each LP direct investment is matched with a deal invested by GPs. The propensity score is estimated using the following deal characteristics: *Early*, *Company Age*, *Round Number*, *Capital Raised*, *Deal Size*, *Number of Investors*, as well as deal year, deal type, company state, and company industry indicators. These characteristics are used as control variables in the regressions. Panel A reports the OLS estimates on the exit outcomes. Panel B shows the covariate balance summary of key variables between companies directly invested by LP investors and those without LP investors. *IPO* is an indicator variable equal to one if the company goes public by the end of 2021, and zero otherwise. *Successful Exit* is an indicator variable equal to one if the company goes public or is acquired with a valuation two times or greater than invested capital, and zero otherwise. *Years to Exit* is the number of years from first PE financing to exit and is missing if there is no exit. $\ln(\text{Exit Value})$ is the natural logarithm of the exit valuation for companies that go public or are acquired. *Direct Investment* is an indicator variable equal to one if the PE deal is directly invested by LP investors, and zero otherwise. Detailed variable definitions are provided in Appendix B. Huber-White standard errors are reported in brackets. ***, ** and * indicate 1%, 5% and 10% significance level.

Panel A: Company Exit Outcomes

	IPO (1)	Successful Exit (2)	Years to Exit (3)	$\ln(\text{Exit Value})$ (4)
Direct Investment	0.003 [0.006]	-0.000 [0.008]	0.020 [0.112]	-0.038 [0.063]
Controls	✓	✓	✓	✓
Deal Year FE	✓	✓	✓	✓
Deal Type FE	✓	✓	✓	✓
Company State FE	✓	✓	✓	✓
Company Industry FE	✓	✓	✓	✓
Observations	9,301	9,301	2,281	2,113
Adjusted R^2	0.168	0.161	0.307	0.330

Panel B: Covariate Balance Summary

	Standardized Differences		Variance Ratios	
	Raw	Matched	Raw	Matched
Early Stage	-0.422	0.036	1.039	0.983
Company Age	0.070	0.001	0.675	0.658
Round Number	0.493	0.044	1.547	1.003
Capital Raised	0.329	0.015	2.064	0.910
Deal Size	0.225	-0.020	1.763	0.730
Number of Investors	0.857	0.064	1.777	0.848