The Separation of Ownership and Control and Its Impact on Corporate Tax Avoidance

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ABSTRACT: We investigate the impact of organizational structure on corporate tax avoidance. Our empirical predictions are based on agency theory in Fama and Jensen (1983) regarding the separation of decision management, decision control, and residual risk sharing (i.e., ownership and control). We base our primary tests on a unique sample of firms with privately-owned equity but publicly-traded debt, where some firms are owned by private equity (PE) firms, while others are owned by the firm's management or employees. Our sample exhibits substantial variation in the separation of ownership and control, but holds financial reporting requirements relatively constant across all firms, making it ideal for examining the influence of organizational structure on corporate tax avoidance. The results consistently indicate that corporate tax avoidance is increasing in the separation of ownership and control, and thus increase our understanding of fundamental firm characteristics that influence corporate tax practices.

Keywords:
Ownership structure
Agency costs
Tax avoidance
Private equity firms
Effective tax rates

1. Introduction

In this study we investigate the impact of organizational structure on corporate tax avoidance. Specifically, we examine whether variation in the separation of ownership and control influences the tax avoidance of private firms with different ownership structures. Our empirical predictions are based on agency theory in Fama and Jensen (1983) regarding the circumstances in which firms choose to separate or combine "decision management" (i.e., the initiation and implementation of decisions) and "decision control" (i.e., the ratification and monitoring of decisions) with "residual risk sharing." Fama and Jensen (1983) explain that the separation of decision management from residual risk sharing is what the literature on open corporations refers to as the "separation of ownership and control" (p. 307), where the residual claimants (i.e., common equity owners) share the residual risk and cash flows of the firm.

We base our primary tests on a unique sample of firms with privately-owned equity but publicly-traded debt, where some firms are owned by private equity (PE) firms, while others are owned by the firm's management or employees.[1] This particular sample of private firms exhibits substantial variation in the separation of ownership and control, while holding financial reporting requirements, and thus financial reporting pressure, relatively constant across all firms. Together these features make our research setting ideal for examining the influence of organizational structure on corporate tax avoidance. Our results consistently indicate that corporate tax avoidance is increasing in the separation of ownership and control, and thus should be of interest to researchers, regulators, and investors that seek to understand the fundamental firm characteristics that influence corporate tax practices.

[1] For the remainder of this paper we refer to firms with private equity and public debt as "private" firms and firms with public equity and public debt as "public" firms.

To be able to issue public debt, all of our private firms are larger, have higher credit ratings, higher earnings quality, and likely have more resources for tax planning and are financially stronger than other private firms that do not issue public debt (Denis and Mihov 2003; Bharath et al. 2008; Katz 2009; Givoly et al. 2010). Due to their public debt, our sample firms are required to file financial statements with the Securities and Exchange Commission (SEC) in accordance with Sections 13 and 15(d) of the Securities Exchange Act of 1934, which enables us to utilize audited financial information to examine their corporate tax planning.

Our first analysis compares the tax avoidance of private firms that are owned by PE firms (PE-backed firms) and private firms that are owned by the firm's management or employees (non-PE-backed firms). PE firms, such as The Blackstone Group, The Carlyle Group, and Kohlberg Kravis & Roberts, manage investment funds that generally buy mature businesses via leveraged buyout transactions. We predict that PE-backed firms avoid more income taxes than non-PE-backed firms because our sample of private, non-PE-backed firms exhibits greater concentration of ownership and control than our sample of PE-backed firms. Our prediction is based on Fama and Jensen's (1983) theory that when residual claims are restricted to decision agents, it is rational for decision agents to invest in less risky "projects" because they are not able to fully diversify their "portfolios" (p. 306), including their investments in the firm. Since tax avoidance is a risky activity that can impose significant costs on firms and their managers (e.g. Rego and Wilson 2012), we assert that tax avoidance is one risky activity in which undiversified decision management agents will minimize their investments. Using a variety of measures of corporate income tax avoidance,[2] we find robust evidence that PE-backed private firms avoid

[2] We rely on four measures of tax avoidance because each measure reflects tax avoidance with error and none are clearly superior to the other three. To the extent we obtain results that are consistent across the four measures we can be confident that our findings are highly robust across the various tax avoidance metrics.

more income taxes than non-PE-backed private firms, consistent with firms with more concentrated ownership and control tolerating less corporate tax risk.

To triangulate our primary results and also verify they are not driven by fundamental differences between PE-backed and non-PE-backed firms, we perform a series of within-sample tests. First, we partition our sample of PE-backed firms based on three empirical proxies for the extent of diversification of the decision agents (e.g., managers), including whether the PE-backed private firm is: 1) owned by a PE firm that owns many or fewer portfolio firms, 2) owned by a large or a small PE firm, and 3) majority- or minority-owned by a PE firm. Second, we partition our sample of non-PE-backed firms into management-owned and employee-owned private firms. Each of these partitions effectively divides our samples of PE-backed and non-PE-backed private firms based on the relative diversification of the decision agents. For example, PE firms with many portfolio firms are more diversified than PE firms with fewer portfolio firms, and large PE firms are generally more diversified than small PE firms. Despite smaller sample sizes, we continue to find that private firms with less concentrated ownership and control avoid significantly more income tax than other private firms, consistent with our predictions.

We perform a variety of robustness tests to evaluate the strength of our results. First, although our main tests are based on samples of PE- and non-PE-backed private firms that are propensity score-matched on numerous firm characteristics (e.g., size, profitability and leverage), we also perform a difference-in-difference analysis that explicitly accounts for differences in private ownership structures (PE- and non-PE-backed) and also for differences in private firm size (small-sized and large-sized private firms), since Fama and Jensen (1983) acknowledge that the optimal organizational structure may vary by firm size (p. 307) and there is some evidence that tax avoidance varies with firm size (e.g., Zimmerman 1983; Rego 2003; Dyreng et al. 2008).

We continue to find that PE-backed firms avoid more income taxes than non-PE-backed firms and this tax avoidance differential is larger for small-sized firms, consistent with PE-backed firms benefiting from lower marginal costs of tax avoidance due to their PE firm owners.

Second, we compare the tax avoidance of private and public firms. Based on agency theory in Fama and Jensen (1983), we predict that our sample of private firms avoids less income tax compared to: (1) the years their equity is publicly-traded, and (2) a matched sample of public firms. The empirical results generally support our predictions and suggest that public firms avoid more income tax than private firms, consistent with private firm managers choosing to avoid less income tax due to their greater equity ownership levels and suboptimal portfolio diversifications. Lastly, we provide exploratory evidence regarding the methods that PE-backed firms utilize to avoid more income taxes than non-PE-backed firms, including the use of intangible assets, tax-exempt investments, tax credits, and the use of multi-jurisdictional tax planning, including affiliates in low-tax foreign countries.

Our study extends the finance and accounting literatures in several ways. Prior accounting research considers the impact of different organizational structures, including family ownership and dual-class stock on corporate tax practices (e.g., Klassen 1997; Mills and Newberry 2001; Chen et al. 2010; McGuire et al. 2011), but these studies provide disparate evidence on how organizational structure influences corporate tax avoidance. In contrast, we use Fama and Jensen's (1983) theory on the separation of ownership and control to build a cohesive framework for understanding how one specific feature of organizational structure – the separation of ownership and control – impacts corporate tax practices. In addition, our study provides new insights on the extent and the speed with which firms alter their tax practices in the periods surrounding going-public and going-private transactions. Finally, our results increase

our understanding of how PE firms generate value in their portfolio firms. Prior research documents that PE firms create value in their portfolio firms by implementing effective financial and operating strategies and by actively monitoring top executives at their portfolio firms (e.g., Cao and Lerner 2009; Kaplan and Stromberg 2009; Masulis and Thomas 2009). However, little is known about PE-backed firms' tax practices. Given recent criticisms of PE firm investment practices,[3] and the growing significance of PE firms for the U.S. capital markets,[4] our study provides new insights to regulators, investors, and researchers on the extent to which PE firms increase portfolio firm value by increasing their tax efficiency relative to other private firms.

2. Background

2.1 Separation of Ownership and Control and Prior Tax Research

Corporations exhibit substantial variation in the extent to which equity ownership is separated from control over corporate decision-making (i.e., "decision management" in Fama and Jensen 1983). At the extremes, small closely-held corporations have highly concentrated equity ownership and control, while large publicly-traded corporations have nearly complete separation of equity ownership and control. The separation of ownership and control creates well-known agency problems, including managerial incentives to pursue non-value-maximizing behaviors such as shirking, perquisite consumption, and rent extraction. To reduce these agency costs, firms write contracts that align managers' incentives with those of shareholders. These contracts incentivize managers to invest in projects that increase the value of the firm (e.g., Jensen and Meckling 1976; Smith and Watts 1982; Smith and Stulz 1985).

[3] The rapid growth of the PE industry has raised concerns regarding anticompetitive behavior, excessive tax benefits, and stock manipulations in this sector (see Katz 2009 and Section 2 for further discussion).

[4] The cumulative capital commitments to non-venture capital PE firms in the U.S. between 1980 and 2006 is estimated to be close to $1.4 trillion (Stromberg 2008). In addition, approximately $400 billion of PE-backed transactions were announced in both 2006 and 2007, representing over two percent of the total capitalization of the U.S. stock market in each of these years (Kaplan 2009). Despite a decline in PE transactions since 2007, experts maintain that PE firms have become a permanent component of U.S. investment activity (e.g., Kaplan 2009; Kaplan and Stromberg 2009).

Fama and Jensen (1983) describe the circumstances in which firms should separate or combine decision management and decision control with residual risk sharing (i.e., ownership and control).[5] In particular, these organizational features should be combined in the same decision agents in smaller organizations where information relevant to decision-making is concentrated in a small number of agents. In this case, the benefits of low agency costs and efficient decision-making are greater than the costs of reduced risk sharing. In contrast, decision management should be separated from residual risk sharing in larger organizations where information relevant to decision-making is diffused across agents at all levels of the organization. In this case, the benefits of diffuse residual claims and the separation of decision management from residual risk sharing are greater than the agency costs they generate. One key factor in Fama and Jensen's (1983) theory is the extent to which residual claims are concentrated in a few decision agents. When residual claims are concentrated, Fama and Jensen state that it is rational for decision agents to invest in less risky projects because their portfolios are less diversified than those of decision agents in organizations with unrestricted risk sharing.[6]

Consistent with Rego and Wilson's (2012) view of corporate tax avoidance, we argue that tax avoidance is one risky activity in which undiversified decision agents will minimize their investments. Rego and Wilson (2012) maintain that tax avoidance is a risky activity that can impose significant costs on firms and their managers, including fees paid to tax experts, time devoted to the resolution of tax audits, reputational penalties, and penalties paid to tax authorities. Thus, risk-averse managers likely prefer to undertake less risky tax planning, while

[5] While decision management refers to the initiation and implementation of decisions by "decision agents" (typically top executives), decision control refers to the ratification and monitoring of corporate decisions and decision agents (typically by the board of directors). As explained in Section 1, the residual claimants (i.e., the common equity owners) share the residual risk and cash flows of the firm.

[6] The combination of decision management and decision control *with* residual risk sharing in a small number of agents also generates "efficiency losses because decision agents must be chosen on the basis of wealth and willingness to bear risk as well as for decision skills" (Fama and Jensen 1983, p. 306).

risk-neutral shareholders prefer managers to implement all tax strategies that are expected to increase firm value, regardless of risk.

Prior accounting research has examined the impact of different organizational structures on corporate tax practices, but no single study has developed a cohesive framework for understanding how variation in one basic organizational feature – the separation of ownership and control – impacts tax avoidance across a broad set of firms. Instead, prior research has investigated tax avoidance at family owned firms (Chen, et al. 2010), at dual-class stock firms (McGuire et al. 2011), at firms with hedge fund activists (Cheng et al. 2012), and more generally at public and private firms (e.g., Beatty and Harris 1998; Mikhail 1999; Mills and Newberry 2001). Klassen (1997) documents public firms that are subject to higher capital market pressure place greater weight on the income reported to shareholders than on the income reported to tax authorities when divesting operating units.[7] That is, public firms that are subject to greater capital market pressure are willing to trade-off higher tax costs for the benefit of higher financial accounting income. In this study we endeavor to take a broader perspective. We use Fama and Jensen's (1983) theory on the separation of ownership and control to first develop empirical predictions for variation in tax avoidance among private firms with different ownership structures. We then use the same theory to develop empirical predictions for variation in tax avoidance across private and public firms. Importantly, we do not assume that firms are required to trade-off higher tax costs for the benefit of higher financial accounting income.

2.2 Private Equity Firms

[7] Klassen (1997) utilizes inside ownership concentration as his proxy for financial reporting pressure, where inside ownership concentration is measured as the percentage of common stocks owned by the five largest insiders. Klassen's empirical tests are based on a sample of 327 public firms, which have mean (median) inside ownership concentration of 15.1 (8.2) percent and a standard deviation of 18.1 percent.

Our main empirical tests are based on PE-backed and non-PE-backed private firms. PE firms manage investment funds that generally acquire majority control of mature, profitable businesses via leveraged buyout (LBO) transactions. We refer to these acquired businesses as "portfolio firms" or "PE-backed firms." Before we develop our empirical predictions, we first discuss the organizational structure of PE firms, and then describe how PE firms manage their portfolio firms (i.e., the PE-backed firms). This discussion provides the foundation for several empirical predictions, and ultimately is essential to understanding the "ownership and control" of PE-backed firms.

PE firms have received much attention in recent years due to their substantial impact on merger and acquisition activity and their generous tax treatment in the U.S. and other countries. PE firms are typically organized as limited partnerships and most PE firm executive managers are also partners in the PE firm. Thus, we also refer to PE firm managers as "PE firm partners." PE firms manage the PE investment funds that directly acquire mature, profitable businesses via LBO (see Figure 1). These transactions often involve substantial amounts of debt, resulting in highly leveraged portfolio firms. PE funds have limited life spans (approximately 10 years) and typically receive a 20 percent share (i.e., 'carried interest') of any gains generated by the sale or IPO of their portfolio firms, in addition to an annual management fee (Kaplan and Stromberg 2009). The taxation of PE firms and PE firm partners has been criticized as exceedingly unfair.[8]

The generally negative view of the tax benefits enjoyed by PE firms contrasts other characteristics associated with their management of portfolio firms. PE firms usually obtain

[8] While the management fees are generally taxed as ordinary income (i.e., 35 percent tax rate), the carried interest is taxed as long-term capital gain (i.e., 15 percent tax rate). This tax treatment of carried interest, as well as the fact that some PE firms have been able to avoid corporate taxation once they file for an initial public offering (e.g., The Blackstone Group) has provoked numerous negative press reports, proposed changes to federal income tax laws, and academic studies on the tax treatment of PE firms (e.g. Fleischer 2007, 2008; Knoll 2007; Cunningham and Engler 2008; Lawton 2008).

operational control of portfolio firms through a concentrated ownership stake and control of the board of directors, with the intent of substantially improving portfolio firm performance. PE firm partners actively control the portfolio firms, while imposing highly leveraged capital structures and performance-based compensation on portfolio firm managers (Kaplan and Stromberg 2009). PE firm partners use their control to act as advisors to portfolio firm managers, to alter company policies, and to challenge portfolio firm managers to perform better (Masulis and Thomas 2009). PE firm partners do not hesitate to replace poorly performing managers at their portfolio firms (Kaplan and Stromberg 2009; Acharya et al. 2010). Large PE firms often hire professionals with operating backgrounds and industry expertise to work with portfolio firm managers (Gadiesh and MacArthur 2008; Acharya et al. 2010).[9]

Prior research documents the extensive control that PE firms have over portfolio firm boards, and argues that these boards are more actively involved in portfolio firm governance than the boards of most public firms. Portfolio firm boards are typically comprised of the CEO, PE firm partners, and outside industry experts. These board members advise portfolio firm management on strategic considerations, and monitor and motivate the management team (Cotter and Peck 2001; Jensen 2007; Masulis and Thomas 2009). Portfolio firm boards are considered more effective than public company boards, since part-time independent directors in public firms are not as financially incentivized as full-time PE partners (Gilson and Whitehead 2008; Masulis and Thomas 2009).[10]

[9] We had detailed conversations with partners at a large public accounting firm that provides tax services to PE-backed firms. The partners indicated that PE firms frequently arrange for their portfolio companies to acquire tax services from a specific accounting firm, with the intention of reducing portfolio firm tax costs through more sophisticated tax strategies than would not otherwise be used by the portfolio firm (e.g., maximizing the utilization of net operating loss carryforwards and R&D tax credits). Some PE firms centralize other administrative services for their portfolio firms, including accounting, legal, and insurance services, although these practices vary from one PE firm to the next. Such centralization is intended to further reduce portfolio firm costs.

[10] These findings also apply to the comparison of PE-backed firms to other *private* firms: "Compared to other private companies, private-equity-backed companies are more likely to recruit professional management, replace

Prior research documents that portfolio firms' boards are smaller than comparable public firms' boards, and they meet more frequently via both formal and informal meetings (Cornelli and Karakas 2008; Kaplan and Stromberg 2009; Masulis and Thomas 2009). Due to the extensive due diligence performed by PE firm partners prior to an acquisition, the specialized internal reporting requirements imposed by PE firms, and the operational focus of portfolio firm boards, portfolio firm managers generally have superior information available for effective and timely decision-making (Jensen 2007; Masulis and Thomas 2009). In sum, prior research indicates that PE firms exercise substantial control and effective corporate governance over their portfolio firms.

While PE firms typically have operational control over portfolio firms through their control of portfolio firm boards, they usually do not assume management roles in their portfolio companies (e.g., Cao and Lerner 2009; Kaplan and Stromberg 2009; Masulis and Thomas 2009). In addition, PE firms have relatively concentrated equity ownership – or residual risk sharing – in their portfolio firms. This separation of residual risk sharing from decision management at PE-backed firms leads to an organizational structure that separates decision management from decision control. In contrast, private firms that are owned by the firm's management or employees typically combine decision management and decision control in few agents (see Section 5.2 for additional discussion and evidence), which leads to residual claims that are largely restricted to these decision agents and provides the basis for our empirical predictions.

3. Empirical Predictions

Fama and Jensen (1983) describe the circumstances in which firms should separate or combine "decision management and decision control with residual risk sharing" (i.e., ownership

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underperforming management, and introduce performance-based pay that is more strongly tied to long-term performance" (Strömberg 2009, p.8).

and control). When residual claims are concentrated in a small number of decision agents, Fama and Jensen state that decision agents are less likely to invest in risky projects because their portfolios are less diversified than those of decision agents in organizations with unrestricted risk sharing. Since tax avoidance is a risky activity that can impose significant costs on firms and their managers (e.g. Rego and Wilson 2012), we predict that income tax avoidance is one risky activity in which undiversified decision agents will minimize their investments. Utilizing a variety of settings where the separation of ownership and control exhibits substantial variation, we empirically test one specific implication of Fama and Jensen's (1983) theory. Specifically, we examine whether firms that exhibit greater separation in their ownership and control avoid more income tax than firms with more concentrated ownership and control.

3.1 Predictions for PE-Backed and Non-PE-Backed Firms

We utilize a unique sample of private firms to test this hypothesis. Our sample includes firms with privately-owned equity but publicly-traded debt. This sample holds financial reporting pressure relatively constant across all firms,[11] but also exhibits substantial variation in the separation of equity ownership and decision control. Our primary tests are based on private firms that are owned by PE firms (PE-backed firms) and private firms that are owned by management or employees (non-PE-backed firms). As demonstrated in later analyses, top executives at non-PE-backed firms generally own greater proportions of company stock than top executives at PE-backed firms (e.g., management-owned firms exhibit the highest rates of inside

[11] We assert that financial reporting pressure is relatively constant across all sample firms because all sample firms are required to file financial statements with the SEC. To address concerns that some of our private firms are subject to different financial reporting pressure because they plan to go public or were just taken private, we re-run our main tests separately for the sub-groups of private firms that eventually go public (Private → Public) and that once were public but then go private (Public → Private). Specifically, we compare the tax avoidance of PE vs. non-PE-backed firms during the *first five private firm-years* (if available) after transitioning from public ownership. Similarly, we compare the tax avoidance of PE vs. non-PE-backed firms during the *last five private firm-years* (if available) prior to transitioning to public ownership. Our results (untabulated) confirm that PE-backed private firms avoid more income taxes than non-PE-backed private firms.

ownership among all sample firms). As a result, non-PE-backed firms exhibit higher concentrations of ownership and control than PE-backed firms. Building on Fama and Jensen (1983), these higher concentrations of ownership and control at non-PE-backed firms should cause non-PE-backed firm managers to invest in less risky projects (and tolerate less tax risk) than PE-backed firms. Thus, our first empirical prediction is:

P1. PE-backed private firms avoid more income tax than non-PE-backed private firms.

It is possible that PE-backed private firms are fundamentally different from non-PE-backed firms (beyond the differences in ownership and control) and these differences influence the tax practices at PE-backed and non-PE-backed private firms. Thus, we also perform within-sample tests to further investigate whether variation in separation of ownership and control is systematically related to corporate tax avoidance. Our goal is to separately partition our sub-samples of PE-backed and non-PE-backed private firms based on the diversification of the "decision agents." However, we do not have stock ownership data for all sample firms; so we instead partition our sub-samples based on other attributes that are likely correlated with the diversification of the decision agents.

Figure 2, Panel A illustrates the extent to which ownership and control are separated at firms with different organizational structures. While non-PE-backed private firms exhibit the least separation, publicly-traded firms exhibit the highest separation of ownership and control, and PE-backed private firms fall somewhere in between. Panel B demonstrates the extent to which residual risk sharing is diversified across residual claimants for these three types of firms, with non-PE-backed private firms having the lowest diversification of residual risk, public firms having the highest diversification of risk, and PE-backed private firms again falling somewhere in between. Panel B also illustrates how we partition the sub-samples of PE-backed and non-PE-

backed private firms such that the partitioned sub-samples also reflect the relative diversification of residual risk across residual claimants.

3.2 Predictions for Within-Sample Tests of Non-PE-Backed Firms

Starting with our only partition of non-PE-backed firms, employee-owned firms generally have stock ownership that is diffused across many individuals, while management-owned firms generally have stock ownership concentrated in a much smaller number of decision agents (Bova et al. 2012a; Bova et al. 2012b).[12] As a result, decision agents at management-owned firms should on average have less diversified portfolios than decision agents at employee-owned firms. Consistent with P1, the relative portfolio diversifications of managers at management- and employee-owned private firms should influence the tax practices at these firms. Thus, our next empirical prediction is:

> **P2.** Employee-owned private firms avoid more income tax than management-owned private firms.

3.3 Predictions for Within-Sample Tests of PE-Backed Firms

We now turn to the PE-backed private firms. Fama and Jensen (1983) assert that when residual claims are restricted to decision agents, it would be rational for decision agents to invest in less risky projects. Their assertion is based on the premise that these decision agents have less diversified portfolios. So we identify sub-samples of PE-backed firms whose "decision agents" are likely less diversified and thus more risk averse. There are two types of decision agents at PE-backed firms: PE firm partners and top executives at PE-backed firms. PE firm partners typically serve on – and often control – the boards of directors at PE-backed firms and thus are mainly decision control agents. In contrast, top executives at PE-backed firms were either

[12] Bova et al. (2012a) document that employee stock ownership plans (ESOPs) account for 71.4 percent of the aggregate equity in their sample of employee-owned public firms in the U.S., while non-ESOP plans account for 28.6 percent of the aggregate equity. We demonstrate that employee-owned firms generally have stock ownership that is diffused across many individuals for our sample firms in later analyses.

explicitly hired or implicitly endorsed by the PE firm partners and thus are mainly decision management agents. Hence, we view the portfolio diversification of both: 1) PE firm partners, and 2) top executives at PE-backed firms, as relevant partitioning variables.

We first focus on *PE firm partners* as the relevant decision agents and partition PE-backed firms based on the number of portfolio firms that each PE firm owns. Because *PE firm partners* are typically required to invest in portfolio firms, we expect *PE firm partners* at PE firms that own a larger number of portfolio firms to have more diversified portfolios than PE firm partners at PE firms that own a smaller number of portfolio firms. A PE firm is classified as having "many" portfolio firms if they own more than 200 portfolio firms *and* their ratio of equity invested-to-number of portfolio firms is greater than $30 million. We classify all PE firms not meeting these two requirements as having "fewer" portfolio firms. We expect PE firms with fewer portfolio firms to have PE firm partners that are less diversified and thus more risk averse, which leads to our next empirical prediction:

> **P3.** PE-backed firms that are owned by PE firms with more portfolio firms avoid more income tax than PE-backed firms that are owned by PE firms with fewer portfolio firms.

Consistent with the discussion above, we also partition PE-backed firms based on whether they are owned by large or small PE firms, where "large" PE firms include the fifteen largest PE firms, as measured by total capital under PE firm management during our sample period.[13] We classify all other PE firms as "small" PE firms. We expect large PE firms to maintain more diversified investment portfolios than small PE firms,[14] to enjoy greater

[13] The fifteen largest PE firms are Carlyle Group, Blackstone Group, Warburg Pincus, Kohlberg, Kravis, Roberts and Company, Goldman Sachs and Company, Cerberus Capital Management, Fortress Investment Group, Apollo Global Management, Bain Capital, TPG Capital, 3i Group, Apax Partners Worldwide, Thomas H. Lee Partners, Morgan Stanley Private Equity, and Welsh, Carson, Anderson, and Stowe.

[14] Untabulated results support our expectations since the number of portfolio firms is generally declining as average total assets under PE firm management declines. Specifically, the fifteen largest PE firms own 321 portfolio firms on average (with average total assets under management of $17.6 billion), while the next fifteen largest PE firms

economies of scale at both the PE firm and portfolio firm levels (since large PE firms own larger portfolio firms on average), and to have PE firm partners that are wealthier, which should also affect their risk tolerance. Thus, we expect *PE firm partners* at large PE firms to have more diversified portfolios than PE firm partners at small PE firms. The expected lower diversification of PE firm partners at small PE firms leads to our next empirical prediction:

> **P4.** PE-backed firms that are owned by large PE firms avoid more income tax than PE-backed firms that are owned by smaller PE firms.

In our last partition, we focus on the *top executives* at PE-backed firms as the relevant decision agents. Private firms can be majority- or minority-owned by PE firms, where greater than 50 percent equity ownership by a single PE firm constitutes majority-PE ownership. As demonstrated in later analyses, top executives at majority-owned, PE-backed firms generally own significantly less stock than the top executives at minority-owned, PE-backed firms.[15] Thus, *top executives* at minority-owned PE-backed firms experience less separation of ownership and control and likely have less diversified portfolios than top executives at majority-owned PE-backed firms, which leads to our final empirical prediction:

> **P5.** Majority-owned, PE-backed firms avoid more income tax than minority-owned, PE-backed firms.

In addition to our arguments above regarding the impact of separation of ownership and control on corporate tax avoidance at PE-backed firms, there is at least one other reason that PE-backed firms could avoid more income taxes than non-PE-backed firms: lower marginal costs of

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own 150 portfolio firms on average (with average total assets under management of $7.6 billion). For PE firms ranked 16 – 100 based on assets under management, the average number of portfolio firms owned is 108, while PE firms ranked lower than 100 (out of 4,858 total PE firms) own just 9 portfolio firms on average. Nonetheless, we note that the Pearson correlation between the PE-backed firms that we classify as owned by "large PE firms" and "PE firms with many portfolio firms" is just 34 percent, and so these two classifications of PE-backed firms capture different but somewhat overlapping underlying constructs.

[15] The Pearson correlation between the PE-backed firms that we classify as "majority-owned PE-backed firms" and firms that are owned by "large PE firms" ("PE firms with many portfolio firms") is just 19 (8.8) percent, and so these classifications of PE-backed firms capture different but somewhat overlapping underlying constructs.

tax avoidance. Conversations with tax partners at a large public accounting firm reveal that to reduce costs for their portfolio firms some PE firms centralize certain administrative services for their portfolio firms, including accounting services. For example, some PE firms will require their portfolio firms to purchase legal services from Law Firm X and insurance services from Insurance Company Y. Thus, it is possible that the centralization of accounting services could reduce the marginal costs of tax planning for PE-backed firms.[16] To the extent that PE firms reduce the marginal costs of tax planning by centralizing tax services for their portfolio firms (small and large alike), we expect to find larger differences between small-sized PE-backed and non-PE-Backed firms than between large-sized PE-backed and non-PE-backed firms, given that larger firms likely enjoy economies of scale to tax planning (e.g., Rego 2003; Dyreng et al. 2008).

4. Research Design

4.1 Measures of Corporate Tax Avoidance

We rely on several measures of tax avoidance because different measures capture different aspects of corporate tax planning and all reflect tax avoidance with error. Our first two measures are based on effective tax rates and include *GAAP_ETR* and *CASH_ETR*, where *GAAP_ETR* (*CASH_ETR*) is total tax expense (cash taxes paid) summed over three years, scaled by adjusted pretax income summed over three years.[17] Both measures convey a firm's average tax cost per dollar of pretax income and capture a broad range of tax planning activities that can have both certain and uncertain outcomes with tax authorities. Recent research presents

[16] However, tax services must be tailored to fit the particular needs of each portfolio company and so it is not clear that PE-backed firms truly enjoy lower marginal costs of tax planning.

[17] Whenever possible we use three years of data to calculate *GAAP_ETR* and *CASH_ETR*. However, if data limitations (such as transition years or missing values) prohibit us from using three years of data, we next use two years, followed by one year of data. Results are qualitatively similar if we base our calculations on one year of data.

evidence that both effective tax rate measures reflect variation in tax avoidance across firms (Dyreng et al. 2008; Robinson et al. 2010; Armstrong et al. 2012).

We complement these effective tax rate measures with two additional measures that were designed to capture more risky tax avoidance: Frank et al.'s (2009) discretionary permanent book-tax difference measure (*DTAX*) and Wilson's (2009) measure of tax sheltering (*SHELTER*). While *DTAX* is the residual from a regression of permanent book-tax differences on non-discretionary sources of those differences,[18] *SHELTER* is the predicted value from a tax shelter prediction model. Frank et al. (2009) demonstrate that *DTAX* is significantly associated with actual cases of tax sheltering and Wilson (2009) demonstrates that *SHELTER* is able to predict tax shelter activity out-of-sample. See the Appendix for details on how we calculate each of these measures.

We acknowledge that all four measures reflect income tax avoidance with error. While the effective tax rate measures are commonly used in accounting research and understood by a broad set of financial statement users, they capture all types of tax avoidance (i.e., risky and non-risky strategies alike). Moreover, *GAAP_ETR* is confounded by changes in tax reserves and the valuation allowance, while *CASH_ETR* is confounded by the timing of tax payments, settlements with tax authorities, and some types of earnings management. In contrast, *DTAX* and *SHELTER* were designed to capture more risky tax avoidance, and in fact both measures are associated with tax shelter transactions (Frank et al. 2009; Wilson 2009). But *DTAX* only captures "permanent"

[18] *GAAP_ETR* also reflects variation in permanent book-tax differences, where permanent book-tax differences are differences between financial and taxable income that do not reverse through time (e.g., interest income from municipal bonds is exempt from federal income taxation but included in pre-tax financial income). *DTAX* is distinct from *GAAP_ETR* because Frank et al.'s (2009) model is designed to remove non-discretionary sources of permanent book-tax differences from *DTAX* to isolate intentional, more aggressive tax avoidance.

tax strategies,[19] and both *DTAX* and *SHELTER* are based on cross-sectional empirical models that are subject to criticisms similar to those directed at discretionary accrual models (i.e., the models estimate tax avoidance with error). None of the four measures is clearly superior (or inferior) to the other three. Consequently, we rely on all four measures in our empirical tests to evaluate the robustness of our results.

4.2 Modeling the Impact of Separation of Ownership and Control on Corporate Tax Avoidance

To investigate whether the separation of ownership and control impacts corporate tax avoidance, we estimate equation (1) below. Our main analyses are based on a sample of PE-backed and non-PE-backed private firms. Thus, the variable of interest in equation (1) is *PE_BACKED*:

$$TAX_i = \alpha_0 + \alpha_1 PE\_BACKED_i + \alpha_2 RNOA_i + \alpha_3 LOSS_i + \alpha_4 NOL_i + \alpha_5 LEV_i + \alpha_6 INTANG_i + \alpha_7 MNC_i + \alpha_8 AB\_ACCR_i + \alpha_9 EQ\_EARN_i + \alpha_{10} SALES\_GR_i + \alpha_{11} ASSETS_i + \alpha_{12} SOX_i + \alpha_{13} INV\_MILLS_i + \alpha_j \Sigma_i YEAR_i + \alpha_k \Sigma_l INDUS_i + \varepsilon_i, \quad (1)$$

The dependent variable, *TAX*, represents the four proxies for corporate tax avoidance: *GAAP_ETR*, *CASH_ETR*, *DTAX*, and *SHELTER*. The indicator variable, *PE_BACKED*, equals one if a PE firm has a majority or minority ownership stake in a private firm, and zero otherwise. If PE-backed firms engage in more tax avoidance than non-PE-backed firms, then the coefficient on *PE_BACKED* should be significant and negative (positive) in regressions where *GAAP_ETR* and *CASH_ETR* (*DTAX*, *SHELTER*) are the dependent variables. See the Appendix for a detailed definition of each variable included in equation (1).

Equation (1) also includes controls for factors that influence a firm's tax avoidance activity, as documented by prior research (e.g., Manzon and Plesko 2002; Rego 2003; Dyreng et al. 2008; Frank et al. 2009; Wilson 2009; Chen et al. 2010). The first set of control variables,

[19] "Temporary" tax strategies reverse through time because they *temporarily* accelerate expense recognition or defer revenue recognition, while "permanent" tax strategies affect book and taxable income differently, and in a manner that is not expected to reverse (e.g., shifting income from a high-tax to a low-tax location).

which includes *RNOA*, *LOSS*, *NOL*, and *LEV*, controls for a firm's need to tax plan. We include an indicator variable, *LOSS*, and the return on net operating assets (*RNOA)* as proxies for current profitability, since profitable firms have greater incentive to tax plan. We include an indicator variable for the presence of net operating loss carryforwards (*NOL*) at the beginning of the year, since firms with loss carryforwards have less incentive to engage in current year tax planning. We include a firm's leverage ratio (*LEV*) because firms with greater leverage have less need to tax plan due to the tax benefits of debt financing.

We include an indicator variable for foreign operations (*MNC*) in equation (1), since firms with foreign operations have greater opportunities for tax avoidance by shifting income between high and low tax rate locations (e.g., Rego 2003). *MNC* equals one if a firm reports non-zero foreign income or foreign tax expense, and zero otherwise. We control for intangible assets (*INTANG)* and equity in earnings of unconsolidated affiliates *(EQ_EARN)* because these items often generate differences between book and taxable income and can thus affect our tax avoidance measures.[20] We include sales growth (*SALES_GR*) in equation (1) because growing firms likely make larger investments in depreciable assets, which generate larger temporary book-tax differences and can thus affect our tax avoidance measures. We control for firm size (*ASSETS*) because large firms enjoy economies of scale in tax planning. We include an indicator variable for years following the Sarbanes-Oxley Act of 2002 (*SOX*), since prior research demonstrates that the regulatory environment surrounding corporate financial and tax reporting changed substantially in the post-SOX time period (e.g. Cohen et al. 2008). We further include

[20] We note that intangible assets represent at least two different constructs. First, intangible assets are subject to different amortization rules for financial and tax reporting purposes; thus, to some extent, intangible assets generate nondiscretionary book-tax differences that are unrelated to intentional tax avoidance. Second, intangible assets are also frequently used to avoid income taxes; e.g., the placement of intangible assets in a low-tax jurisdiction allows firms to shift profits from high-tax jurisdictions to low-tax jurisdictions. Thus, intangible assets also capture a firm's ability to engage in multijurisdictional tax avoidance. By including *INTANG* in our regressions, we are biasing against finding significant results for our variables of interest (e.g., *PE_BACKED*).

year (*YEAR*) and industry (*INDUS*) fixed-effects to control for fundamental differences in tax planning that may exist across years and industries.

Frank et al. (2009) find a strong positive relation between financial and tax reporting aggressiveness. Katz (2009) documents that PE-backed firms report more conservatively and engage in less earnings management compared to non-PE-backed firms. To the extent our test and control firms exhibit different financial reporting quality, we need to control for financial reporting quality in equation (1). Thus, we control for both timely loss recognition and earnings management by including *AB_ACCR* in equation (1). *AB_ACCR* is the amount of abnormal accruals after controlling for conservatism in our abnormal accruals calculation (see Ball and Shivakumar 2006).

Our last control variable is the inverse Mills ratio (*INV_MILLS*) from the first stage of the Heckman (1979) sample selection correction procedure. This two-stage estimation procedure corrects for any endogeneity associated with PE firm investment decisions (e.g., if the same characteristics that influence PE firm ownership are also correlated with portfolio firm tax avoidance). In the first stage, we estimate the following probit regression, which predicts whether a private company is owned by a PE firm (*PE_BACKED*):

$$\begin{aligned} PE\_BACKED = {} & \beta_0 + \beta_1 BVE + \beta_2 RNOA + \beta_3 Q\_RATIO + \beta_4 OPER\_CYCLE + \\ & \beta_5 FIRM\_AGE + \beta_6 CASH + \beta_7 CAP\_EXP + \beta_8 BIG\_AUDIT + \beta_9 LOSS + \\ & \beta_{10} NOL + \beta_{11} LEV + \beta_{12} MNC + \beta_{13} INTANG + \beta_{14} EQ\_EARN + \\ & \beta_{15} SALES\_GR + \beta_{16} AB\_ACCR + \beta_{17} SOX + \beta_{18} ASSETS + \varepsilon \end{aligned} \quad (2)$$

See the Appendix for complete definitions of the variables included in equation (2), which is based on existing models of private investor financing and PE ownership (e.g. Chou et al. 2006, Morsfield and Tan 2006, Katz 2009, Beuselinck et al. 2009).[21] We compute the inverse Mills' ratio for each firm-year observation based on the estimated coefficients for equation (2),

[21] See also Ball and Shivakumar (2005) and Givoly et al. (2010) for a similar methodological approach in the comparison of private and public firms.

and then include that variable in equation (1), the second stage of the Heckman estimation procedure.[22]

5. Sample Selection and Empirical Results

5.1 Sample Selection

Our initial sample consists of private firms that have publicly-traded debt. Because their debt is public, these firms must file financial statements with the SEC, even though their equity is privately-held. We follow Katz (2009) and select all firm-year observations on Compustat in any of the 33 years from 1978 through 2010 that satisfy the following criteria: (1) the firm's stock price at fiscal year-end is unavailable, (2) the firm has total debt as well as total annual revenues exceeding $1 million, (3) the firm is a domestic company, (4) the firm is not a subsidiary of another public firm, and (5) the firm is not a financial institution or in a regulated industry (SIC codes 6000-6999 and 4800-4900). To ensure that the sample includes only private firms with public debt, we examine each firm and remove public firm observations (details provided in Table 1, Panel A). We further categorize each firm as being in one of the following categories: (1) PE majority-owned, defined as firms whose equity is majority-owned (i.e., more than 50 percent) by PE firms, according to Thomson Financials VentureXpert, (2) PE minority-owned, defined as firms whose equity is minority-owned (i.e., less than or equal to 50 percent) by PE firms, and (3) non-PE-backed, defined as firms that do not have a PE sponsor and are at least 50 percent owned by founders, executives, directors, family members, or employees. The resulting sample consists of 2,970 private firm-year observations and 568 private firms.

[PLACE TABLE 1 HERE]

[22] We estimate the Heckman (1979) two-stage procedure using Lee's (1979) switching simultaneous equation (see Maddala, 1983, Chapter 9). In the first-stage probit regressions, we obtain MacKelvey-Zavonia pseudo-R-squares that range between 68 percent and 74 percent, which validates the relevance of our chosen explanatory variables.

Table 1, Panel B presents the industry composition of our sample of private firms with public debt (the 2,970 observations in Panel A). Our sample of private firms with public debt is generally consistent with the broader Compustat population over the same time period. Only the proportions of private firms in the services (23.7 vs. 13.6 percent) and retail (16.3 vs. 9.4 percent) industries are significantly different from the Compustat population.

To examine how tax avoidance changes around changes in equity ownership, we limit our sample to firms that have *both* private and public ownership phases.[23] This limitation generates a sample of 260 firms with 3,764 firm-year observations, of which 2,467 are public and 1,297 are private. The final sample consists of 87 firms that are first publicly-traded and then taken private (i.e., public-to-private transactions); 120 firms that are first privately-held and then taken public (i.e., private-to-public transactions); and 53 firms that experience public-to-private-to-public transactions (Table 1, Panels C and D). Panel E presents the distribution of Panel D observations through time. The results indicate that the number of public firm-years in our sample peaks during the mid-1990s, while the number of private firm-years peaks during the late 1980s and early 1990s.

To examine whether the characteristics of PE- and non-PE-backed firms identified in prior research also apply to our sample of PE- and non-PE-backed firms, we hand-collect information on ownership, board composition, and CEO characteristics from SEC filings and the BoardEx database. To minimize the hand-collection process, we randomly select three minority PE-backed firms[24] for each year in our sample and match them with both majority PE-backed

[23] We made this research design choice because we wanted to test Fama and Jensen's (1983) theory on the separation of ownership control across a broad set of organizational structures, including those explained in Section 2 but also across the private and public ownership phases of the same firm (see Section 5.6).

[24] SFAS No. 109 significantly modified the accounting for income taxes and the related tax footnote disclosures. Thus, we hand-collect tax footnote data only for years since SFAS No. 109 went into effect (i.e., since 1994). To include *all* minority-PE-backed firms in our sample, we include four observations of minority PE-backed firms for fiscal years 1994 and 1995, instead of the three observations included for fiscal years 1996 – 2005.

and non-PE-backed private firms in the same year and the same four-digit SIC code. If a match is not available in the same four-digit SIC code, we then find a match in the same three- (or two-) digit SIC code. Thus, our sample of hand-collected data includes 38 firms that are majority PE-backed, 38 firms that are minority PE-backed, and 38 firms that are non-PE backed. We also hand-collect tax footnote information from SEC financial filings for these same three sets of firms, to gain a better understanding of the types of tax strategies adopted by our sample of private firms (see Section 5.7).

5.2 Descriptive Statistics on Ownership, Board Composition, and CEO Characteristics

As shown in Table 2, PE firms have on average 83 (31) percent ownership in their majority-owned (minority-owned) portfolio firms. Importantly, non-PE-backed firms are on average 69 percent owned by management and 51 percent owned by CEOs. In contrast, majority-owned (minority-owned) PE-backed firms are just 15 (33) percent owned by management and 7 (22) owned by CEOs. In addition, while 59 percent of the board members at non-PE-backed firms are insiders, 45 (30) percent of board members at minority-owned (majority-owned) PE-backed firms are insiders. Taken together, these findings confirm the discussion in Section 3 that non-PE-backed firms have more highly concentrated ownership and control than PE-backed firms (P1), and minority-owned PE-backed firms have more highly concentrated ownership and control than majority-owned PE-backed firms (P5).[25]

[PLACE TABLE 2 HERE]

The results in Table 2 also indicate that PE firms have 62 (39) percent representation on their majority-owned (minority-owned) portfolio firms' boards. The chairman of the board is a

[25] In untabulated analyses based on non-PE-backed firms only, we find that among 30 management-owned firms, management holds a 78 percent ownership stake on average. In contrast, among 8 employee-owned firms, the employees hold a 71 percent ownership stake on average (mainly through ESOP plans), while management has a 15 percent ownership stake on average. These results demonstrate the greater separation of ownership and control at employee-owned firms relative to management-owned firms.

representative of the PE firm owner 29 (48) percent of the time and the CEO is either nominated by or is affiliated with the PE firm owner 58 (44) percent of the time. All of these statistics clearly demonstrate PE firms' abilities to monitor and control portfolio firms' management and boards of directors, consistent with the discussion in Section 2.2.[26]

Lastly, the results in Table 2 indicate that majority-owned, PE-backed firms have larger boards of directors than both minority-owned, PE-backed firms and non-PE-backed firms, and their CEOs are less likely to serve as the chairman of the board. Consistent with PE firms tying management's compensation to portfolio firm performance, the CEOs of both majority- and minority-owned, PE-backed firms are more likely to receive stock option compensation than the CEOs of non-PE-backed firms. Overall, we conclude that our sample of PE-backed firms is similar to those examined in prior research, which finds that PE-backed firms are generally subject to higher-quality corporate governance practices (see Section 2.2).

5.3 Results for Tests that Compare PE-Backed and Non-PE-Backed Private Firms

The evidence in Table 2 indicates that PE-backed private firms differ from other private firms with respect to management ownership concentration and control of the boards of directors. According to Fama and Jensen's (1983) agency theory, variation in residual risk sharing (i.e., management ownership concentration) should influence management's willingness to invest in risky projects, which we argue includes income tax avoidance. To examine the impact (if any) of ownership structure on corporate tax avoidance, we perform a propensity score matching procedure to mitigate concerns that our results are driven by fundamental differences

[26] The Pearson correlation between PE firm ownership and PE representation on the board of directors is 61.4 percent (p-value <0.001). We find no instances where PE firms have minority ownership but majority representation on the board of directors. We find only four instances (out of 38) where PE firms has majority ownership but minority representation on the board of director; however, in all four instances the chairman of the board represents the PE firm (two firms) and/or the CEO was nominated by the PE firm (three firms).

between PE-backed and non-PE-backed firms.[27] We first calculate propensity scores derived from a probit model, where the dependent variable is a PE ownership indicator variable, and the model includes variables that are significantly different between PE-backed and non-PE-backed firms, including *RNOA*, *LOSS*, *NOL*, *LEV*, *MNC*, *INTANG*, *AB_ACCR*, *SALES*, and *ASSETS*. We then match each non-PE-backed firm-year, one-to-one, to the PE-backed firm-year with the closest propensity score, without replacement.[28] To ensure that each non-PE-backed firm-year and its match are similar to each other, we restrict the two firms to have propensity scores within 0.10 of each other.

Descriptive statistics in Table 3, Panel A for the propensity score-matched PE-backed and non-PE-backed private firms indicate that the matched samples do not differ with respect to the control variables. However, in Panel B we observe significant differences for all four measures of tax avoidance. These results uniformly suggest that PE-backed firms engage in more tax avoidance than non-PE-backed private firms. In particular, mean and median amounts of *GAAP_ETR* and *CASH_ETR* are statistically lower, while mean and median amounts of *DTAX* and *SHELTER* are significantly higher for PE-backed firm-years. These results are consistent with P1, which predicts that PE-backed firms avoid more income taxes than non-PE-backed private firms.

Panel C presents Pearson and Spearman correlations between the *PE_BACKED* indicator variable and each measure of tax avoidance. Consistent with Panel B, the correlations in Panel C indicate that PE-backed private firm-years engage in more tax avoidance than non-PE-backed

[27] Indeed, comparison of PE-backed firms and non-PE-backed firms reveals significant differences in many firm's characteristics. In particular, PE-backed private firms are significantly less profitable (e.g., *RNOA*, *LOSS*, and *NOL*), have significantly higher leverage ratios, are more likely to have foreign operations (*MNC*), report more total and intangible assets (*ASSETS* and *INTANG*), but smaller abnormal accruals than non-PE-backed firms. We also conduct our analysis without propensity score matching and our conclusions are the same as those presented in this paper.

[28] For additional insight into the propensity score matching procedure, see Marosi and Massoud (2008), Angrist and Pischke (2009), or Armstrong et al. (2010).

private firm-years. In addition, most of the correlations between the measures of tax avoidance are as expected. In particular, the *ETR* measures are positively correlated with each other, while *DTAX* and *SHELTER* are positively correlated with each other. However, the *ETR* measures are not highly correlated with *DTAX* and *SHELTER*, perhaps due to the fact that the latter two measures are designed to capture more risky tax avoidance, but also likely due in part to the fact that all four measures reflect tax avoidance with error.

[PLACE TABLE 3 HERE]

Table 4 contains regression results for tests of P1, which predicts PE-backed firms avoid more income taxes than non-PE-backed private firms.[29] The coefficients on all four measures of tax avoidance are in the predicted directions and are statistically significant based on two-tailed p-values, consistent with P1.[30,31] The coefficient on *PE_BACKED* in the *CASH_ETR* regression indicates that PE-backed firms pay 9.3 percent less income tax per dollar of adjusted pre-tax income than non-PE-backed private firms. These results hold after controlling for firm size, profitability, leverage, and foreign operations. The coefficient on *CASH_ETR* suggests a surprisingly large economic difference in tax avoidance between PE-backed and non-PE-backed firms.[32] This economic difference is somewhat aligned with findings in Kaplan (1989) and Kaplan and Stromberg (2009) regarding the impact of PE firm owners on net income margins (e.g., 10 percent increase) and on the ratio of cash flow to sales (e.g., 40 percent increase) when

[29] The number of observations differs across most regressions due to different data requirements. The *GAAP_ETR* and *CASH_ETR* regressions are based on fewer observations (585 and 486, respectively) because these measures require firms to have positive pretax income over a three-year time period.

[30] Regressions where *DTAX* (*SHELTER*) is the dependent variable do not include *INTANG* and *EQ_EARN* (*RNOA*, *LEV*, *MNC*, *AB_ACCR*, and *ASSETS*) because those variables are included in the estimation of *DTAX (SHELTER)*, and thus are orthogonal to *DTAX (SHELTER)*, by design.

[31] We include *LOSS* in the *GAAP_ETR* and *CASH_ETR* regressions because *GAAP_ETR* and *CASH_ETR* are scaled by the sum of pretax net income over years *t*, *t-1*, and *t-2* while *LOSS* captures whether year *t*'s net income is less than zero.

[32] However, these cash tax savings are not received in perpetuity, since PE-backed firms are generally sold or taken public through an initial public offering within 10 years of the private equity acquisition.

public firms are taken private. However, Guo et al. (2011) document more modest increases in operating and cash flow margins for PE-backed firms. Thus, the economic significance of the *PE_BACKED* coefficients should be interpreted with caution. Finally, the coefficient on *INV_MILLS* is positive but not significant, consistent with sample selection bias having little impact on our estimates.[33] Overall, our results are consistent with the separation of ownership and control having a significant impact on the tax avoidance practices of private firms.

[PLACE TABLE 4 HERE]

5.4 Results for Within-Sample Tests of PE-Backed and Non-PE-Backed Private Firms

In order to more specifically examine how the separation of ownership and control impacts corporate tax practices we partition our sample of private firms based on the extent of diversification of the decision agents, where decision agents include both *top executives* at PE-backed and non-PE-backed firms and *PE firm partners*, which typically control the boards of directors at PE-backed firms. Recall that our four empirical proxies for decision agent diversification include whether the private firm is: 1) owned by a PE firm that owns many or fewer portfolio firms, 2) owned by a large versus small PE firm, 3) majority- or minority-owned by a PE firm, and 4) owned by management or employees. As discussed in section 2, *PE firm partners* at large PE firms and at PE firms with many portfolio firms are generally *more diversified* than PE firm partners at small PE firms and at PE firms with fewer portfolio firms. In addition, *top executives* at majority-owned, PE-backed firms and at employee-owned firms typically have *smaller ownership stakes* than the top executives at minority-owned PE-backed firms and at management-owned firms. Based on P2 – P5, we generally predict that firms with more diversified decision agents should avoid more income taxes.

[33] Stolzenberg and Relles (1997) argue that if selection bias is moderate then the two-step estimation approach can generate estimates that are inferior to those from ordinary least squares estimation. In untabulated results we re-estimate equation (1) after excluding *INV_MILLS* and our primary inferences are unchanged.

Table 5 provides evidence that supports all four empirical predictions (P2 – P5). Specifically, we find robust evidence that majority-owned-PE-backed firms avoid more income taxes than minority-owned-PE-backed firms, and PE-backed firms that are owned by large PE firms avoid more income taxes than those that are owned by smaller PE firms. These results are statistically and economically significant across all four tax avoidance metrics. Three of the four tax avoidance measures also indicate that PE-backed firms owned by PE firms with many portfolio companies avoid more income taxes than those owned by PE firms with fewer portfolio companies. Lastly, the results for *CASH_ETR* and *SHELTER* suggest that employee-owned firms avoid more income taxes than management-owned firms, and the results for *GAAP_ETR* and *DTAX* are in the predicted direction but only marginally significant (two-sided p-values between 10 and 15 percent). In summary, despite smaller sample sizes, we continue to find that private firms with less concentrated ownership and control avoid more income tax. These results are consistent with Fama and Jensen's (1983) theory that when residual claims are restricted to decision agents it is rational for decision agents to invest in less risky projects, which we argue includes corporate tax avoidance.

[PLACE TABLE 5 HERE]

5.5 Results for Difference-in-Difference Analyses

We next perform difference-in-difference analyses that explicitly account for differences in private ownership structures (PE- and non-PE-backed) and also differences in private firm size, since Fama and Jensen (1983) acknowledge that the optimal organizational structure may vary by firm size. To the extent that PE firms reduce the marginal costs of tax planning by centralizing tax services for their portfolio firms (small and large alike), we expect to find larger differences between small-sized PE-backed and non-PE-backed firms than between large-sized

PE-backed and non-PE-backed firms, given that larger firms may enjoy economies of scale to tax planning (e.g., Rego 2003; Dyreng et al. 2008). We define small-sized (large-sized) firms as those in the lowest (highest) quartile of net sales for all private firms.

Table 6 Panel A provides univariate evidence that PE-backed firms avoid more income taxes than non-PE-backed firms, and the differences in mean and median *CASH_ETR* and *SHELTER* are statistically larger for small-sized firms than for large-sized firms. For example, the average *CASH_ETR* is 33.6 percent for small-sized, non-PE-backed firms but 24.2 percent for small-sized, PE-backed firms (difference = -0.094; t-statistic = -3.05). In contrast, the average *CASH_ETR* is 31.5 percent for large-sized, non-PE-backed firms and 28.4 percent for large-sized, PE-backed firms (difference = -0.031; t-statistic = -1.68). This "difference-in-difference" of -0.063 is consistent with small-sized PE-backed firms enjoying lower marginal costs of tax planning (due to their PE firm owners).

[PLACE TABLE 6 HERE]

Panel B presents a summary of results for regressions that include *PE_BACKED* and *NON_PE_BACKED* indicator variables that are interacted with *SMALL_SIZE* and *LARGE_SIZE* indicator variables. Each coefficient on the four interaction terms captures the average value for each tax avoidance measure, after controlling for numerous firm characteristics included in equation (1). The results are generally consistent with those in Panel A and suggest that PE-backed firms avoid more income taxes than non-PE-backed firms of the same size (except the *SHELTER* results for large-sized firms), and the differences in tax avoidance are significantly larger between small private firms than between large private firms (except *DTAX* difference is not significant). In sum, Table 6 provides evidence that small-sized, PE-backed firms enjoy lower marginal costs of tax planning due to their PE firm owners.

5.6 Results for Tax Avoidance in Private and Public Firms

Our main analyses focus on tax avoidance at private firms that exhibit variation in the separation of ownership and control. One advantage of our focus on private firms is that it holds financial reporting pressure relatively constant across our sample. However, Fama and Jensen's (1983) agency theory should also explain – at least in part – variation in tax avoidance at public and private firms. Public firms generally exhibit greater separation of ownership and control than private firms, and hence we expect decision agents at public firms to be willing to avoid more income taxes than decision agents at private firms, given likely differences in the portfolio diversifications of managers at public and private firms. We first examine changes in tax avoidance in the periods surrounding going-private and going-public transactions. We then compare tax avoidance at private and propensity score-matched public firms. Thus, both analyses hold certain firm characteristics constant (either through time or in the cross-section).

However, beyond our discretionary accrual measure we are not able to fully control for differences in financial reporting pressure at public and private firms, which prior research predicts should influence the tradeoffs between financial and tax reporting decisions. Public firms are generally subject to greater financial reporting pressure than private firms, since public firms are subject to scrutiny from numerous investors, financial analysts, and regulators such as the SEC, while most private firms are not. Consequently, public firms are less willing than private firms to engage in transactions that *reduce both financial and taxable income*, which provides the basis for predictions that public firms are less sensitive to tax consequences than private firms (e.g., Penno and Simon 1986; Cloyd, Pratt, and Stock 1996; Beatty and Harris 1998; Chen et al. 2010). In contrast, Mills and Newberry (2001) find that public firms report larger book-tax differences than private firms, consistent with public firms avoiding more

income taxes through transactions that *reduce tax but not financial income*. Thus, our tests of tax avoidance at public and private firms not only apply Fama and Jensen's (1983) agency theory to tax avoidance at public and private firms, but also reexamine findings in prior accounting research based on a broad set of tax avoidance measures.

Figure 3 presents the mean values for our tax avoidance measures in the five years preceding and the five years after going-private (Panel A) and going-public (Panel B) transactions. In Panel A the plots of mean *DTAX* and *SHELTER* indicate substantial decreases in tax avoidance in the year before and the year of the going-private transaction. In addition, mean *DTAX* and *SHELTER* remain low through year *t+5*. The mean *GAAP_ETR* (*CASH_ETR*) plot increases from 35 (26) percent in year *t-1* to 38 (33) percent in year *t+1*, and both measures are significantly higher in year *t+5* than in year *t-5*, also consistent with private firm-years avoiding *less* income tax than public firm-years.

[PLACE FIGURE 3 HERE]

Figure 3, Panel B presents similar graphs for the 10 years surrounding going-public transactions. The plots for mean *DTAX* and *SHELTER* are roughly inverse to those for going-private transactions. In particular, mean *DTAX* and *SHELTER* increase substantially around the year the firm goes public (i.e., year $t = 0$). These results suggest that newly public firms, which experience a sudden increase in the separation of ownership and control, increase their tax avoidance activities around the change in ownership. The mean *GAAP_ETR* and *CASH_ETR* plots also reveal an obvious decline in average tax rates in the transition year. Taken together, the patterns of tax avoidance exhibited in Figure 3 are consistent with the separation of ownership and control influencing the tax practices of public and private firms.[34]

[34] Untabulated analyses reveal that these results remain qualitatively similar once we partition the sample of firms into those that are majority PE-backed, minority PE-backed, and non-PE-backed.

We next compare the tax avoidance of public and private firms in cross-sectional tests. Rather than compare all private firms to similar public firms, we separately compare PE-backed and non-PE-backed private firms to propensity score matched public firms. The results, which are summarized in Table 7 (control variables not tabulated), indicate that non-PE-backed private firms avoid significantly less income tax than similar public firms (i.e., 3 of 4 coefficients on *NON_PE_BACKED* are significant). In contrast, the tax avoidance of PE-backed firms is generally not statistically different from that of similar public firms (i.e., only 1 of 4 coefficients on *PE_BACKED* is significant). Because top executives at majority-owned PE-backed firms have greater separation of ownership and control than minority-owned PE-backed firms, we partition our PE-backed firms into those that are majority- and minority-owned, and then separately compare their tax avoidance to that of similar public firms.[35] These results at the bottom of Table 7 reveal that minority-owned-PE-backed firms avoid significantly less income tax than similar public firms (i.e., all four coefficients on *MINORITY_PE_BACKED* are significant), but we find no significant differences between majority-owned PE-backed firms and similar public firms (despite the larger sample sizes). Taken together, these findings are consistent with Fama and Jensen's (1983) theory that when residual claims are restricted to decision agents (i.e., at non-PE-backed and minority-owned PE-backed private firms) it is rational for decision agents to invest in less risky projects, including less income tax avoidance. In contrast, majority-owned PE-backed firms, whose decision agents have more diversified portfolios, avoid income taxes at the same rate as propensity score-matched public firms.

[PLACE TABLE 7 HERE]

[35] In untabulated analyses, we also compare the tax avoidance of PE-backed firms that are owned by large PE firms (PE firms with many portfolio firms) to that of similar public firms. Those results generally indicate PE-backed firms that are owned by large PE firms (PE firms with many portfolio firms) avoid similar amounts of income tax as a propensity-score matched sample of public firms. Specifically, none of (one of four of) the coefficients on *LARGE_PE_FIRM* (*MANY_PORTFOLIO_FIRMS*) are significant in the four tax avoidance regressions.

5.7 Tax Avoidance Strategies and the Utilization of Foreign Subsidiaries

To gain a better understanding of the tax strategies used by our sample of private firms, we hand-collected detailed income tax data from SEC filings for 144 private firms (see discussion of sample selection in Section 5.1). Specifically, we collected data from statutory reconciliation schedules, which reveal the sources of differences between effective and statutory tax rates, and thus sources of variation in our tax avoidance measures. The results in Table 8 indicate that compared to non-PE-backed firms, PE-backed firms report more negative statutory reconciliation items related to foreign taxes, intangible assets, tax-exempt income (e.g. corporate-owned life insurance policies), and tax credits, consistent with PE-backed firms relying on a variety of tax reduction strategies.

[PLACE TABLE 8 HERE]

We further investigated the use of tax avoidance strategies that involve foreign subsidiaries. Multinational corporations commonly reduce their worldwide tax burdens by strategically locating operations in low tax countries, including "tax havens."[36] Following the methodology in Dyreng et al. (2011), we calculate the number of countries in which firms operate and the number of subsidiaries located in tax havens for several subsets of sample firms.[37] The results in Table 9 indicate that PE-backed private firms have significantly more subsidiaries – and more subsidiaries in tax havens – than non-PE-backed firms. Moreover, our evidence also suggests that majority-owned, PE-backed firms have more subsidiaries in tax haven countries than minority-owned, PE-backed firms. The comparison of PE-backed firms owned by large vs. small PE firms provides the strongest results. Specifically, PE-backed firms

[36] In this paper, the term "tax haven" refers to a country that has been designated a "tax haven" by the Organization for Economic Cooperation and Development (OECD), due to its exceptionally low income tax rates and other favorable tax attributes relative to other countries.

[37] We thank Scott Dyreng for allowing us to use his database.

owned by large PE firms have over twice as many subsidiaries in tax haven countries relative to PE-backed firms owned by small PE firms. Taken together, these results are consistent with our regression analyses and suggest that tax avoidance through foreign operations is an important tax planning tool for PE-backed firms.[38]

[PLACE TABLE 9 HERE]

5.8 Supplemental Analyses

5.8.1 Deletion of Firms with Negative Pre-Tax Income

Although our calculation of *GAAP_ETR* and *CASH_ETR* require the deletion of firm-years if the sum of pre-tax income over years *t-2* to year *t* is negative, we do not impose a similar data requirement on the other measures of tax avoidance (i.e., *DTAX* and *SHELTER*). To further evaluate whether our results are sensitive to the exclusion of firms with negative pre-tax income, we impose a 3-year, positive pre-tax income data requirement on regressions where *DTAX* and *SHELTER* are the dependent variables. Our results (untabulated) are qualitatively similar for this smaller, more profitable sample of firms relative to those shown in all tabulated analyses. We also note that the correlations between our four tax avoidance measures strengthen when we require all sample observations to have positive, cumulative pre-tax income over a three year time period. Specifically, the correlation between *GAAP_ETR* and *DTAX* (*GAAP_ETR* and *SHELTER*) is -0.161 (-0.114) and significant at the one percent level (two-tailed test). Such results highlight the impact of negative pre-tax income firms on our tax avoidance measures.

5.8.2 Tax Benefits from Employee Stock Options

[38] We also hand-collected data regarding fees paid to auditors from SEC filings to determine whether PE-backed firms paid more or less tax fees to their auditors compared to non-PE-backed firms. Tax fees typically include fees for tax compliance, tax planning, and tax advice, which includes assistance with tax audits and appeals, tax advice related to mergers and acquisitions, employee benefit plans, and requests for rulings or technical advice from tax authorities. The untabulated results indicate that PE-backed firms have a significantly higher mean value for tax fees paid to auditors (0.00187, scaled by lagged total assets) than non-PE-backed firms (0.00069), consistent with PE-backed firms investing more resources in tax planning.

Graham et al. (2004) find that employee stock options (ESOs) generate significant tax savings and reduce marginal tax rates for large firms, and thus are important non-debt tax shields. While tax deductions related to ESOs reduce cash effective tax rates, they are not directly reflected in *GAAP_ETR*, *DTAX*, or *SHELTER*. Consistent with PE firms tying portfolio firm management compensation to performance, the CEOs of PE-backed portfolio firms more frequently receive stock options than the CEOs of non-PE-backed firms (e.g. Table 2 and Katz 2009). However, as pointed out by Kaplan and Stromberg (2009), the equity stake of a portfolio firm manager is illiquid because the manager cannot sell portfolio firm equity or exercise stock options until the firm is publicly-traded. Therefore, we do not expect stock options to generate tax benefits for PE-backed firms.

Compustat data regarding ESO tax benefits, which is available for fiscal years 2005 and thereafter (*TXBCO* and *TXBCOF*), indicates that less than 11 percent of our observations report ESO tax benefits, and the differences between PE-backed and non-PE-backed firms remain insignificant. Moreover, we do not find significant differences between the private and public firm samples. We conclude that ESO tax benefits do not significantly affect our results.

5.8.3 Organizational Changes and "Step-Up" in Adjusted Tax Basis of Acquired Assets

As documented in Figure 3, corporate tax burdens and tax avoidance shift dramatically in the periods surrounding going-private and going-public transactions. Following Katz (2009), we expect that other organizational changes such as mergers and acquisitions and bankruptcy can also affect firms' tax avoidance activities. Hence, to verify that major organizational changes do not substantially influence our results, we remove observations during the five years surrounding each of these transactions. All results remain qualitatively similar.

Prior to the 1986 Tax Reform Act, taxable acquisitions of a target company's assets were common and caused "step-up" in the adjusted tax basis of the target company's total assets. The depreciation expense generated by the "step-up" in asset basis created larger book-tax differences, since tax depreciation deductions were larger than book depreciation expense in the years immediately following acquisition. These larger book-tax differences would have been reflected in lower *CASH_ETR* and higher *SHELTER*, but not reflected in *GAAP_ETR* or *DTAX*. To ensure that "step-up" in asset basis does not drive our results, in untabulated sensitivity analyses we alternately: 1) cluster standard errors based on firm and year, and 2) run tests excluding firms that engaged in public-to-private transactions between 1980 and 1986. All results are substantially similar to those tabulated in this study. We conclude that our main results are not driven by "step-up" in asset basis in the years prior to the 1986 Tax Reform Act

6. Conclusions

In this study we investigate the impact of organizational structure on corporate tax avoidance. Our empirical predictions are based on agency theory in Fama and Jensen (1983) regarding the separation of decision management, decision control, and residual risk sharing (i.e., ownership and control). Fama and Jensen (1983) state that when ownership and control are concentrated in a small number of decision agents, it is rational for those agents to invest in less risky projects, since these agents have forgone optimal risk reduction through portfolio diversification. Building on Fama and Jensen (1983), we predict that firms with less concentrated ownership and control avoid more income tax than firms with more concentrated ownership and control. We base our tests on a unique sample of firms with privately-owned equity but publicly-traded debt, where some firms are owned by PE firms, while others are owned by the firm's management or employees. This particular sample of private firms exhibits

substantial variation in the separation of ownership and control, but holds financial reporting requirements relatively constant across all firms, making it ideal for examining the influence of organizational structure on corporate tax avoidance. Our results consistently indicate that corporate tax avoidance is increasing in the separation of ownership and control.

Our findings are subject to several limitations. First, corporate tax avoidance is difficult to measure and like those used in prior research, each of our four tax avoidance measures have their own strengths and weaknesses and none are superior (or inferior) to the other three. The fact that our results are consistent across all four measures implies that our findings are highly robust. Second, although our multivariate regression models control for numerous firm characteristics that account for variation in tax avoidance across firms, it is not possible to control for all sources of variation. Thus, our results should be interpreted with caution in the event we have inadequately controlled for any variable that is correlated with ownership structure (e.g., financial reporting pressure in our public vs. private tests).

Despite these limitations, our study should be of interest to researchers, regulators, and investors that seek to understand the fundamental firm characteristics that influence corporate tax practices. Our study relies on principle-agent theory to build a cohesive framework for understanding how one specific feature of organizational structure – the separation of ownership and control – impacts corporate tax practices. In addition, we provide new insights into the extent and speed with which firms alter their tax practices following an organization change. Overall, our paper contributes toward a better understanding of the impact of insider control and organizational structure on corporate tax avoidance (e.g., Shackelford and Shevlin 2001).

References

Acharya, V., M. Hahn, and C. Kehoe. 2010. Corporate governance and value creation evidence from private equity. Working paper, London Business School.

Angrist, J., and J. Pischke. 2009. Mostly harmless econometrics. Princeton, NJ: Princeton University Press.

Armstrong, C., A. Jagolinzer, and D. Larker. 2010. Chief executive officer equity incentives and accounting irregularities. *Journal of Accounting Research* 48 (2): 225-271.

Armstrong, C., J. Blouin, and D. Larker. 2012. The incentives for tax planning. *Journal of Accounting & Economics* 53 (1-2): 391-411.

Ball, R., and L. Shivakumar. 2005. Earnings quality in UK private firms: Comparative loss recognition timeliness. *Journal of Accounting and Economics* 39 (1): 83–128.

Ball, R. and L. Shivakumar. 2006. The role of accruals in asymmetrically timely gain and loss recognition. *Journal of Accounting Research* 44 (2): 207–242.

Beatty, A. and D. Harris. 1998. The effects of taxes, agency costs and information asymmetry on earnings management: A comparison of public and private firms. *Review of Accounting Studies* 4 (3/4): 299-326.

Beuselinck, C., M. Deloof, and S. Manigart. 2009. Private equity involvement and earnings quality. *Journal of Business Finance and Accounting* 36 (5/6): 587-615.

Bharath, S. T., J. Sunder, and S. V. Sunder. 2008. Accounting quality and debt contracting. *The Accounting Review* 83 (1): 1–28.

Bova, F., Y. Dou, and O.-K. Hope. 2012a. Employee ownership and firm disclosure. Working paper, University of Toronto.

Bova, F., K. Kolev, J. Thomas, and F. Zhang. 2012b. Non-executive employee ownership and corporate risk-taking. Working paper, University of Toronto.

Cao, J. and J. Lerner. 2009. The performance of reverse leveraged buyouts. *Journal of Financial Economics* 91 (2): 139-157.

Chen, S., X. Chen, Q. Cheng, and T. Shevlin. 2010. Are family firms more tax aggressive than non-family firms? *Journal of Financial Economics* 95 (1): 41-61.

Cheng, A., H. Huang, Y. Li, and J. Stanfield. 2012. The effect of hedge fund activism on corporate tax avoidance. Forthcoming in *The Accounting Review*.

Chou, D. W., M. Gombola, and F. Y. Liu. 2006. Earnings management and stock performance of reverse leveraged buyouts. *Journal of Financial and Quantitative Analysis* 41 (2): 407-437.

Cloyd, B., J. Pratt, and T. Stock. 1996. The use of financial accounting choice to support aggressive tax positions: Public and private firms. *Journal of Accounting Research* 34 (1): 23- 43.

Cohen, D., A. Dey, and T. Lys. 2008. Real and accrual-based earnings management in the pre- and post-Sarbanes Oxley periods. *The Accounting Review* 83(3): 757-787.

Cornelli, F., and O. Karakas, 2008. Private equity and corporate governance: Do LBOs have more effective boards? Working paper, London Business School.

Cotter, J. and S. Peck. 2001. The structure of debt and active equity investors: The case of the buyout specialist. *Journal of Financial Economics* 59 (1): 101–147.

Cunningham, N. and M. Engler. 2008. The carried interest controversy: Let's not get carried away. *Tax Law Review,* Cardozo Legal Studies Research Paper No. 211.

Denis, D., and V. Mihov. 2003. The choice among bank debt, non-bank private debt and public debt: Evidence from new corporate borrowings. *Journal of Financial Economics* 70 (1): 3–28.

Dyreng, S., M. Hanlon, and E. Maydew. 2008. Long-Run Corporate Tax Avoidance. *The Accounting Review* 83 (1): 61-82

Dyreng S., B. Lindsey, and J. Thornock. 2011. Exploring the role Delaware plays as a domestic tax haven. Working Paper, Duke University.

Fama, E., and M. Jensen. 1983. Separation of Ownership and Control. *Journal of Law and Economics* 26 (2, Corporations and Private Property: A Conference Sponsored by the Hoover Institution): 301-325.

Fleischer, V. 2007. Taxing Blackstone. University of Illinois Law & Economics Research Paper No. 07-036.

Fleischer, V. 2008. Two and twenty: Taxing partnership profits in private equity funds. *New York University Law Review* 83 (1): 1-59.

Frank, M., L. Lynch, and S. Rego. 2009. Tax reporting aggressiveness and its relation to aggressive financial reporting. *The Accounting Review* 84 (2): 467-496.

Gadiesh, O., and H. MacArthur. 2008. Lessons from private equity any company can use. Bain & Company Inc, Boston MA, Harvard Business Press.

Gilson, R., and C. Whitehead. 2008. Deconstructing equity: public ownership, agency costs, and complete capital markets. *Columbia Law Review* 108(1): 231-264.

Givoly, D., C. Hayn, and S. Katz. 2010. Does public ownership of equity improve earnings quality? *The Accounting Review* 85 (1): 195-225.

Graham, J., M. Lang, and D. Shackelford. 2004. Employee stock options, corporate taxes, and debt policy. *Journal of Finance* 59 (4): 1585-1618.

Guo, S., E. Hotchkiss, and W. Song 2011. Do buyouts (still) create value? *Journal of Finance* 66: 479-517.

Heckman, J. 1979. Sample selection bias as a specification error. *Econometrica* 47 (1): 153–162.

Hribar, P., and D. Collins. 2002. Errors in estimating accruals: Implications for empirical research. *Journal of Accounting Research* 40 (1): 105–134.

Jensen, M. 2007. The economic case for private equity (and some concerns). Keynote Slides, Harvard University.

Jensen, M., W. Meckling. 1976. Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics* 3 (4): 305-360.

Jones, J. 1991. Earnings management during import relief investigations. *Journal of Accounting Research* 29 (2): 192–228.

Kaplan, S. 1989. Management buyouts: Evidence on taxes as a source of value. *Journal of Financial Economics* 24 (2): 217-254.

Kaplan, S. 2009. The future of private equity. *Journal of Applied Corporate Finance* 21(3): 8-20.

Kaplan, S., and P. Stromberg. 2009. Leveraged buyouts and private equity. *Journal of Economic Perspectives* 23 (1): 121-146.

Katz, S. 2009. Earnings quality and ownership structure: The role of private equity sponsors. *The Accounting Review* 84 (3): 623-658.

Klassen, K., 1997. The impact of inside ownership concentration on the tradeoff between financial and tax reporting. *The Accounting Review* 72 (3): 455–474.

Knoll, M. 2007. The taxation of private equity carried interests: estimating the revenue effects of taxing profit interests as ordinary income. Working Paper, University of Pennsylvania Law School.

Lawton, A. 2008. Taxing private equity carried interest using an incentive stock option analogy. *Harvard Law Review* 121 (3): 846.

Lee, L. 1979. Identification and estimation in binary choice models with limited (censored) dependent variables. *Econometrica* 47 (4), 977-996.

Maddala, G. 1983. Limited-dependent and Qualitative Variables in Econometrics. Cambridge University Press, Cambridge, UK.

Marosi, A. and N. Massoud. 2008. "You can enter but you cannot leave…": U.S. securities markets and foreign firms. Journal of Finance 63 (5): 2477-2506.

Manzon, G. and G. Plesko. 2002. The relation between financial and tax reporting measures of income." *Tax Law Review* 55 (2): 175 - 214.

Masulis, R., and R. Thomas. 2009. Does private equity create wealth? The effects of private equity and derivatives on corporate governance. *University of Chicago Law Review* 76 (1): 219-259.

McGuire, S., D. Wang, and R. Wilson. 2011. Dual class ownership and tax a avoidance. Working paper, Texas A&M University.

Mikhail, M. 1999. Coordination of earnings, regulatory capital and taxes in private and public companies. Working Paper, Massachusetts Institute of Technology

Mills, L. and K. Newberry. 2001. The influence of tax and nontax costs on book-tax reporting differences: public and private firms. *Journal of the American Taxation Association* 23 (1): 1-19.

Morsfield, S. and C. Tan. 2006. Do venture capitalists influence the decision to manage earnings in initial public offering? *The Accounting Review* 81 (5): 1119-1150.

Nissim, D. and S. Penman. 2003. Financial statement analysis of leverage and how it informs about profitability and price-to-book ratios. *Review of Accounting Studies* 8 (4): 531–559.

Penno, M. and D. Simon. 1986. Accounting choices: Public versus private firms. *Journal of Business Finance & Accounting* 13 (4): 561-569.

Rego, S. 2003. Tax-avoidance activities of U.S. multinational corporations. *Contemporary Accounting Research* 20 (4): 805-833.

Rego, S., and R. Wilson. 2012. Executive compensation, equity risk incentives, and corporate tax aggressiveness, *Journal of Accounting Research*, 50 (3): 775-809.

Robinson, J., S. Sikes, C. Weaver. 2010. Performance measurement of corporate tax departments. *The Accounting Review* 85(3): 1035-1064.

Shackelford, D. and T. Shevlin. 2001. Empirical tax research in accounting. *Journal of Accounting and Economics* 31 (1-3): 321-387.

Smith, C. and R. Stulz. 1985. The determinants of firms' hedging policies. *Journal of Financial and Quantitative Analysis*. 20: 391-405.

Smith, C. and R. Watts. 1982. Incentive and tax effects of executive compensation plans. *Australian Journal of Management* 7 (2): 139-157.

Stolzenberg, R. and D. Relles. 1997. Tools for intuition about sample selection bias and its correction. *American Sociological Review* 62 (June): 494-507.

Stromberg, P. 2008. The new demography of private equity. Working paper, Swedish Institute for Financial Research.

Stromberg, P. 2009. The economic and social impact of private equity in Europe: Summary of research findings. Working paper, Stockholm School of Economics.

Wilson, R. 2009. An examination of corporate tax shelter participants. *The Accounting Review* 84 (3): 969-999.

Zimmerman, J. 1983. Taxes and firm size. *Journal of Accounting and Economics* 5: 119-149.

Appendix: Variable Measurement

Measures of Tax Avoidance:

GAAP_ETR = Firm *i*'s GAAP effective tax rate, which equals total income tax expense (Compustat TXT), over years *t-2* to *t*, divided by the sum of pre-tax income (PI) minus special items (SPI) in year *t-2* to *t*. If data limitations prohibit us from using years *t-2* to *t*, we next use years *t-1* to *t*, followed by year *t*. *GAAP_ETR* is set to missing when the denominator is zero or negative and we winsorize *GAAP_ETR* to the range [0,1].

CASH_ETR = Firm i's cash effective tax rate, which equals cash taxes paid (TXPD), over years *t-2* to *t*, divided by the sum of pretax net income (PI) minus special items (SPI) in years *t-2* to *t*. If data limitations prohibit us from using years t-2 to t, we next use years *t-1* to *t*, followed by year *t*. *CASH_ETR* is set to missing when the denominator is zero or negative and we winsorize *CASH_ETR* to the range [0,1].

DTAX = Firm *i*'s residual from the following regression, estimated by industry and year: $PERMDIFF_{it} = \beta_0 + \beta_1 INTANG_{it} + \beta_2 UNCON_{it} + \beta_3 MI_{it} + \beta_4 CSTE_{it} + \beta_5 \Delta NOL_{it} + \beta_6 LAGPERM_{it} + e_{it}$; where *PERMDIFF* = Total book-tax differences – temporary book-tax differences = *[{BI – [(CFTE +CFOR) / STR]} – (DTE / STR)]*, scaled by beginning of year assets (AT); *BI* = pretax book income (PI); *CFTE* = current federal tax expense (TXFED); *CFOR* = current foreign tax expense (TXFO); *STR* = statutory tax rate; *DTE* = deferred tax expense (TXDI); *INTANG* = goodwill and other intangible assets (INTAN), scaled by beginning of year assets (AT); *UNCON* = income (loss) reported under the equity method (ESUB), scaled by beginning of year assets (AT); *MI* = income (loss) attributable to minority interest (MII), scaled by beginning of year assets (AT); *CSTE* = current state tax expense (TXS), scaled by beginning of year assets; ΔNOL= change in net operating loss carryforwards (TLCF), scaled by beginning of year assets (AT); *LAGPERM* = *PERMDIFF* in year *t-1*. From 1980 to 1986 the *STR* is 46%, for 1987 the *STR* is 40%, from 1988 to 1992 the *STR* is 34%, from 1993 to 2005 the *STR* is 35%.We winsorize *DTAX* to the range [-1,1].

SHELTER = Probability that firm *i* engages in a tax shelter as defined by Wilson (2009), where Compustat Tax Shelter = -4.86 + 5.20* Book Tax Differences + 4.08*Discretionary Accruals – 1.41*Leverage + 0.76*Size + 3.51*ROA + 1.72*Foreign Income + 2.42*R&D.

Private Firm Indicator Variables:

PE_BACKED = 1 if a PE firm has a majority or minority ownership stake in a private company, and 0 otherwise.

NON_PE_BACKED = 1 if a private firm does not have any PE owners, and 0 otherwise.

MAJORITY_PE_BACKED = 1 if 50 percent or more of the firm is backed by PE firms, and 0 otherwise.

MINORITY_PE_BACKED = 1 if less than 50 percent of the firm is backed by PE firms, and 0 otherwise.

LARGE_PE_FIRMS = 1 if the private equity firm that owns the portfolio firm is one of the following: Carlyle Group, Blackstone, Warburg Pincus, KKR, Goldman Sachs Private Equity, Cerberus Capital, Fortress Investment, Apollo Global, Bain Capital, TPG Capital, 3i Group, Apax Partners, Thomas H. Lee, Morgan Stanley Private Equity, and Welsh Carson Anderson & Stone and 0 for all other PE firms. PE firms are ranked according to total U.S. dollar investment during the years 1980-2009. (Source: Thomson Financials, VentureXpert.)

MANY_PORTFOLIO_FIRMS =1 if the number of firms owned by the PE firm is greater than 200 and the ratio of equity invested divided by number of firms owned is greater than $30 million and 0 otherwise.

EMPLOYEE_OWNED = 1 if more than 50 percent of the firm is owned by its employees and 0 otherwise.

MANAGEMENT_OWNED = 1 if more than 50 percent of the firm is owned by management and 0 otherwise.

LARGE-SIZE =1 if the firm's sales are in the top quartile of net sales (SALE) for all private firms and zero otherwise.

SMALL-SIZE =1 if the firm's sales are in the bottom quartile of net sales (SALE) for all private firms and zero otherwise.

Control Variables and Other Variables of Interest:

AB_ACCR = Firm *i*'s abnormal total accruals in year *t* computed derived from the modified cross-sectional Jones (1991) model. To estimate the model yearly by two-digit SIC code, we require that at least 10 observations be available. The regression is: $TACC_{j,t} / TAj, _{t-1} = a_1*[1 / TA_{j, t-1}] + a_2*[(\Delta REV_{j, t} - \Delta TR_{j, t})/TAj, _{t-1}] + a_3*[PPE_{j, t} / TAj, _{t-1}]$ where: *TACC* is total accruals for firm *j* in year *t*, which is defined as income before extraordinary items (IBC) minus net cash flow from operating activities, adjusted to extraordinary items and discontinued operations OANCF – XIDOC). For the years prior to 1988, *TACC* is defined as Δ(current assets ACT) – Δ(current liabilities LCT) – Δ(cash CHE) + Δ(short-term debt DLC) – (depreciation and amortization DPC). To correct for measurement errors in the balance-sheet approach, we eliminate firm-year observations with "non-articulating" events (Hribar and Collins 2002). *TA* is the beginning-of-the-year total assets (lagged AT). *ΔREV* is the change in sales in year t (SALE), *PPE* is gross property, plant, and equipment in year t (PPEGT), and *ΔTR* is the change in trade receivables in year *t* (RECTR). To control for the asymmetric recognition of gains and losses, the modified Jones model is augmented with the following independent variables: cash flow from operations in year *t* (CF_t), a dummy variable set to 1 if CF_t <1 and 0 otherwise (DCF_t), and an interactive variable, $CF_t \times DCF_t$ (as

suggested by Ball and Shivakumar 2006). CF_t is defined, for years after 1988, as cash from operations in year t adjusted for extraordinary items and discontinued operations (OANCF – XIDOC), and prior to 1988 as funds from operations (FOPT) – Δ(current assets ACT) + Δ(cash and cash equivalent CHE) + Δ(current liabilities LCT) – Δ(short-term debt DLC). All variables are standardized by total assets at year-end *t-1*.

ASSETS = Natural logarithm of the total assets (AT) for firm i, at the end of year *t*.

EQ_EARN = Firm i's equity income in earnings (ESUB) in year *t*, scaled by lagged total assets.

INTANG = Firm i's intangible assets (INTAN) in year *t*, scaled by lagged total assets.

INV_MILLS = The inverse mills ratio from Heckman (1979) two-stage sample selection correction procedure. In the first stage, we estimate the following probit model (results not tabulated):

$$PE\_BACKED = \beta_0 + \beta_1 BVE + \beta_2 RNOA + \beta_3 Q\_RATIO + \beta_4 OPER\_CYCLE + \beta_5 FIRM\_AGE + \beta_6 CASH + \beta_7 CAP\_EXP + \beta_8 BIG\_AUDIT + \beta_9 LOSS + \beta_{10} NOL + \beta_{11} LEV + \beta_{12} MNC + \beta_{13} INTANG + \beta_{14} EQ\_EARN + \beta_{15} SALES\_GR + \beta_{16} AB\_ACCR + \beta_{17} SGA + \beta_{18} ASSETS + \varepsilon$$

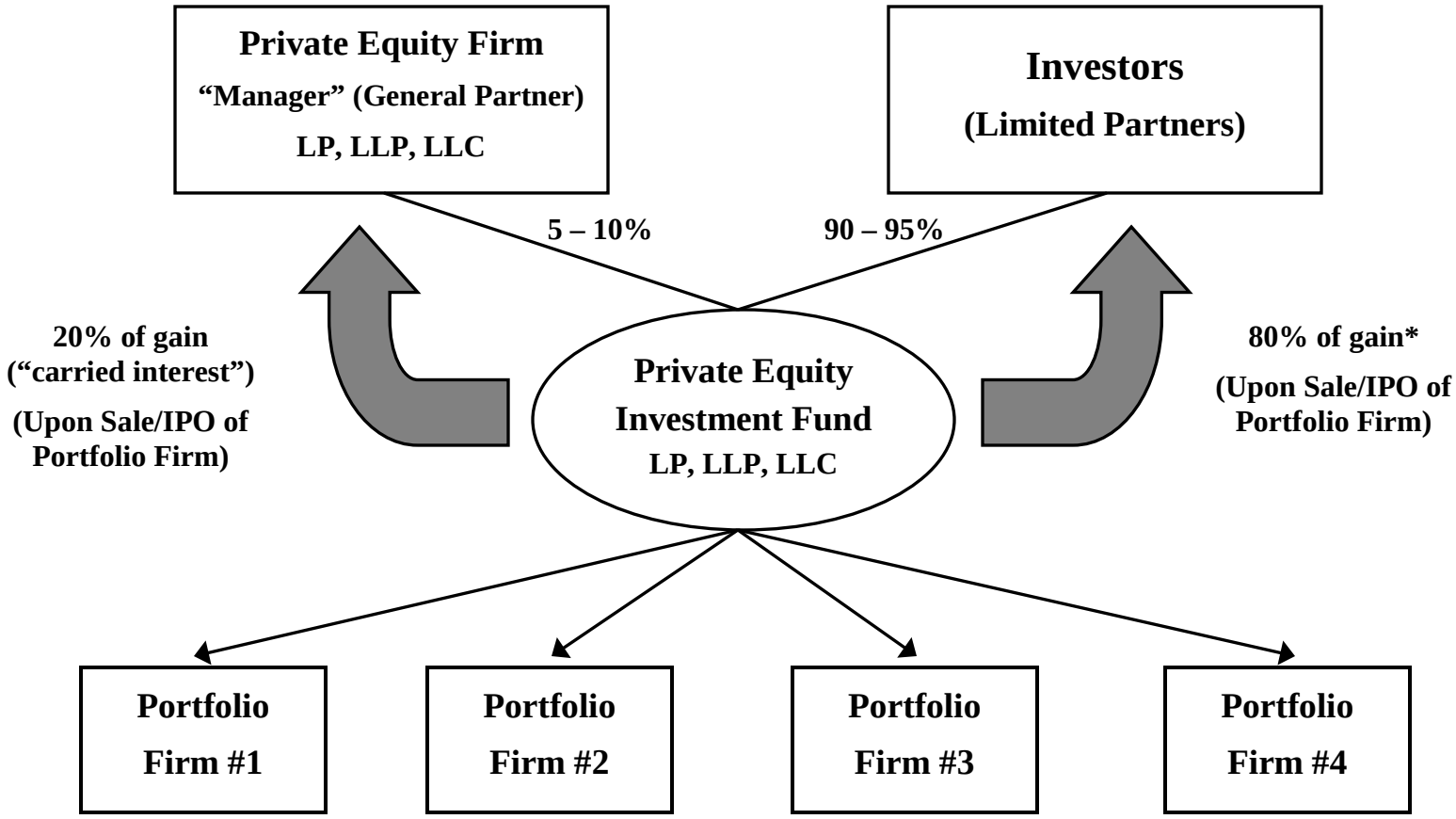
BVE = book value of equity (*Compustat* $CEQ_t + PSTK_t + TXDITC_t$, scaled by AT_{t-1}); *RNOA* = profitability (defined as operating income divided by net operating assets, see above), *Q_RATIO* = quick ratio [cash and short-term investments ($\#CHE_t$) + total receivables ($RECT_t$), scaled by current liabilities (LCT_t)], *OPER_CYCLE* = length of operating cycle [calculated as (yearly average accounts receivable ($RECT_t$)) / (total revenues ($SALE_t$)/360) + (yearly average inventory ($INVT_t$)) / (cost of goods sold($COGS_t$)/360)], *FIRM_AGE* = firm age (years since first appearance on *Compustat*), *CASH* = cash holdings (CHE_t scaled by AT_{t-1}), *CAP_EXP* = capital expenditures ($CAPX_t$) scaled by AT_{t-1}, *LOSS* = 1 if net income (NI) less than zero, and 0 otherwise; and *BIG_AUDIT* = an indicator variable for large accounting firms (AU_t). All other variables as defined above. We use the estimates from the first-stage probit model to compute the inverse Mills' ratio for each sample firm-year. The inverse Mills' ratio serves as a control variable in equation (1), which is the second step of the Heckman estimation procedure.[39]

LEV = Firm i's leverage in year *t*, measured as total long-term debt (DLTT) divided by total assets;

[39] Inverse Mills ratio is defined as: $\lambda(Z) = \varphi(Z)/\Phi(Z)$ if private or PE-backed = 1, and $\lambda(Z) = -\varphi(Z)/(1 - \Phi(Z))$ if private or PE-backed = 0, where: $\varphi(Z)$ is the standard normal pdf, $\Phi(Z)$ is the standard normal cdf, and *Z* are the estimates of the first stage probit model.

LOSS	= 1 if firm i reports a loss, where loss is net income before extraordinary items (IBC) and 0 otherwise.
MNC	= 1 if firm's foreign pre-tax income (PIFO) or foreign income taxes (TXFO) is positive or negative and 0 otherwise.
NOL	= 1 if firm *i* has net operating loss carryforwards (TLCF) available at the beginning of year *t*, and 0 otherwise.
RNOA	= Firm i's operating income divided by net operating assets, where operating income is net income (NI) + Δ(cumulative translation adjustment RECTA) + after-tax interest expense (XINT) – after-tax interest income (IDIT) + minority interest in income (MII). Net operating assets (NOA) are common equity (CEQ) + debt in current liabilities (DLC) + total long-term debt (DLTT) + preferred stock (PSTK) – cash and short-term investments (CHE) – investments and advances (IVAO) + minority interest (MIB); (see Nissim and Penman 2003).
SALES_GR	= Firm *i*'s sales growth, where sales growth is sales (SALE) at the end of year *t* less sales at the beginning of year *t* divided by sales at the beginning of year *t*.
SOX	= 1 if the fiscal year is 2004 and thereafter.
Σ_j *INDUS*	= 1 (0) if firm *i* is (is not) in industry *j* in year *t*, based on three-digit SIC codes.
Σ_j *YEAR*	= 1 (0) if firm *i* is (is not) in year *j*.

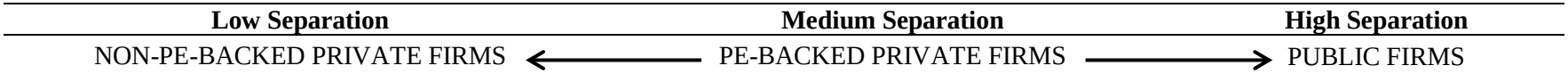
FIGURE 1
Diagram of Typical Organizational Structure for a Private Equity Firm with One PE Fund and Four PE Portfolio Firms



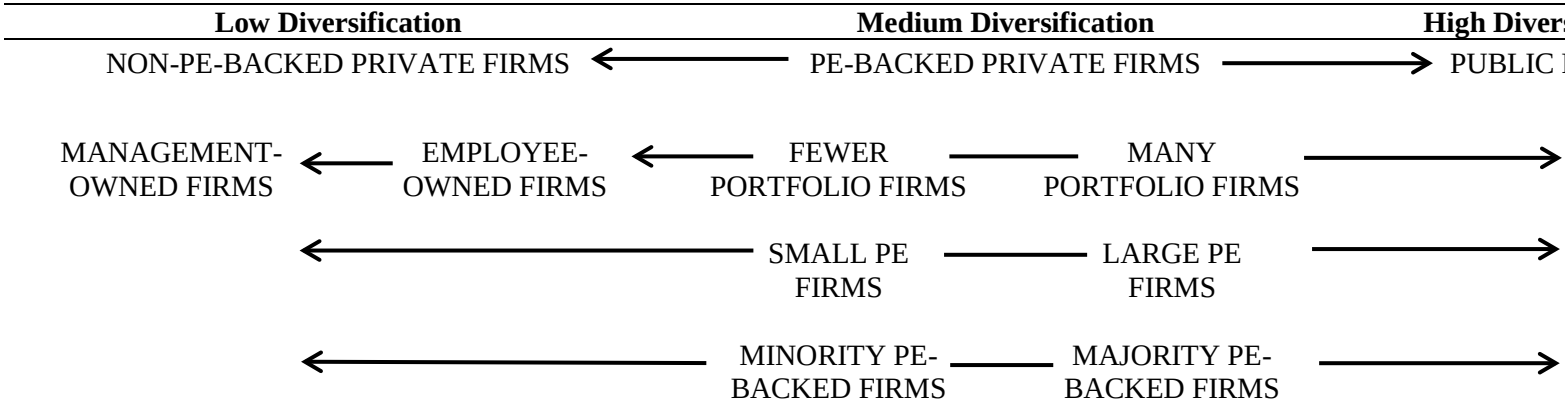
* Approximately ten percent of the total gain is usually distributed to the management team as part of performance based compensation, reducing the investors' share to approximately seventy percent (Fruhan 2009)

FIGURE 2
Separation of Decision Management, Decision Control, and Residual Risk Sharing in Different Organizational Structures

Panel A: Separation of Decision Management, Decision Control, and Residual Risk Sharing:



Panel B: Diversification of Residual Risk Sharing across Residual Claimants:



Panel C: Implications for Tax Avoidance (Based on Diversification of Residual Risk Sharing across Residual Claimants):

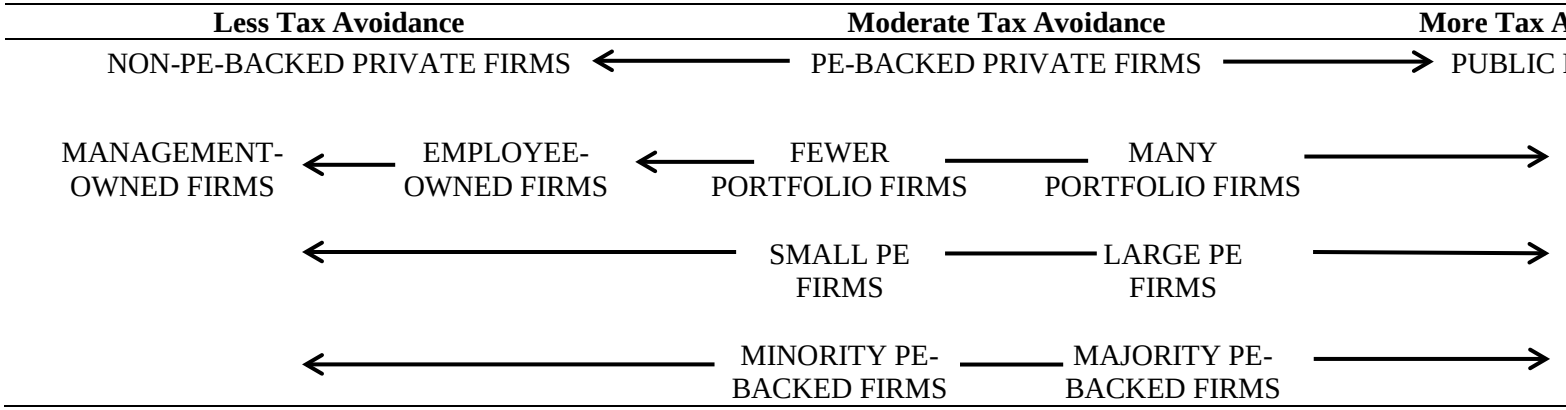
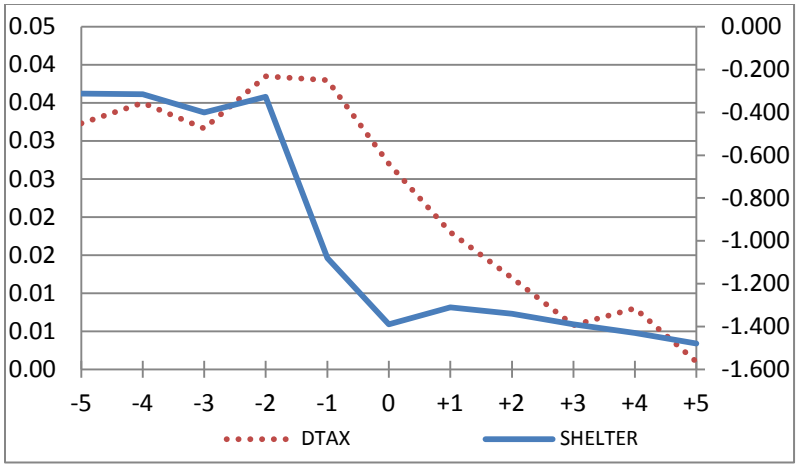
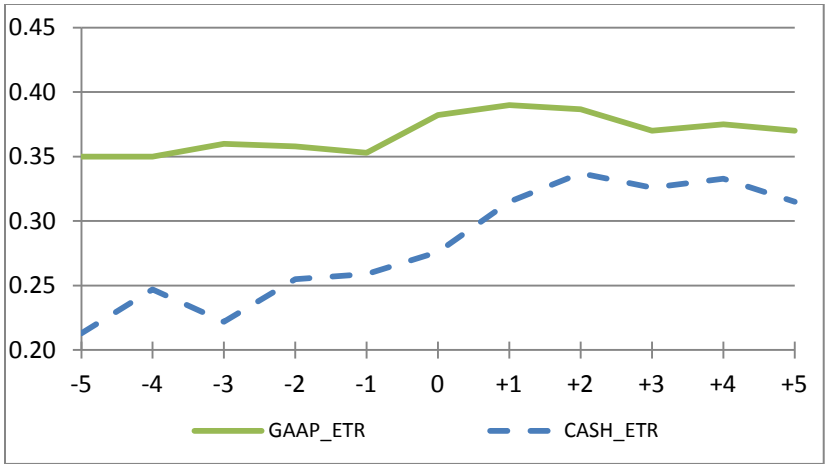


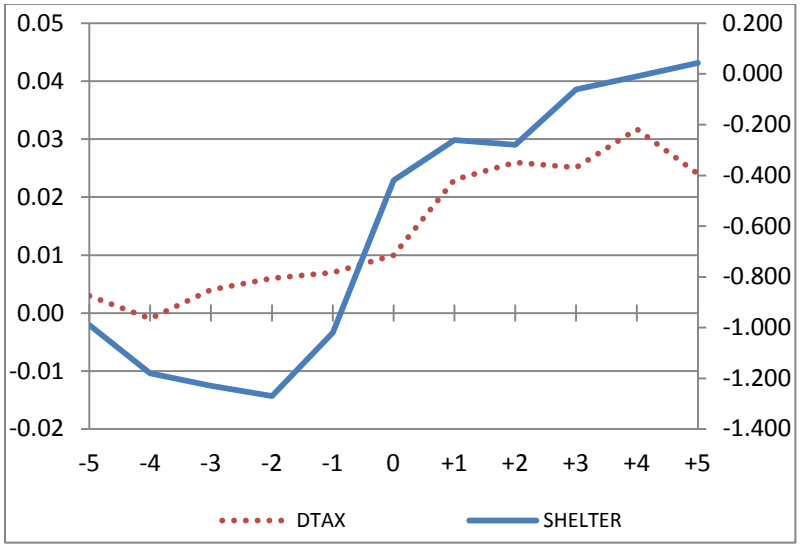
FIGURE 3
Graphs of Mean *TAX* Measures in the Years Surrounding Going-Private and Going-Public Transactions

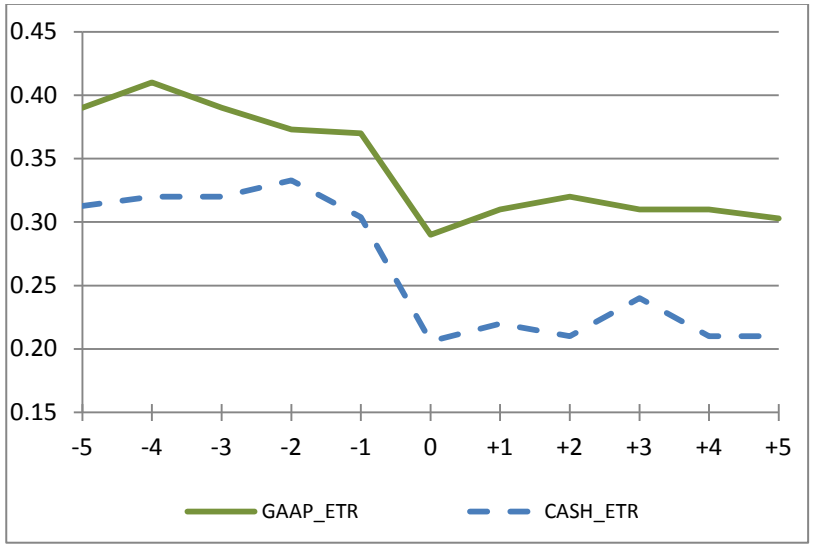
Panel A: Tax Avoidance Measures around Going-Private Transactions





Panel B: Tax Avoidance Measures around Going-Public Transactions





Year zero is the transition year. Where applicable the left axis applies to the *DTAX* plot while the right axis applies to the *SHELTER* plot. All variables are as defined in the Appendix.

TABLE 1
Sample Selection Procedures for Private Firms with Public Debt (1980 – 2010)

Panel A: Private Firms with Public Debt

	No. of Firm-Years	No. of Firms
"Potential" private firms with public debt (Compustat)[a]	14,190	3,699
Eliminate firms that:		
Do not have historical (non-prospectus) data[b]	(3,634)	(1,475)
Are public firms	(2,357)	(380)
Are subsidiaries of public firms	(585)	(108)
Are public spin-offs	(111)	(34)
Are involved in bankruptcy proceedings	(306)	(104)
Have insufficient information	(1,683)	(344)
Are foreign firms	(848)	(226)
Other[c]	(957)	(400)
Subtotal of private firms with public debt	3,709	628
Eliminate firms that:		
Are cooperatives, LPs, government-owned, and firms for which ownership structure cannot be ascertained	(739)	(60)
Private firms with public debt	**2,970**	**568**
Private firms that are majority-owned by PE firms	1,646	350
Private firms that are minority-owned by PE firms	327	71
Private firms without PE ownership	997	147
Final sample of private firms with public debt that have both private firm-years *and* public firm-years[d]	**3,764**	**260**

Panel B: Industry Classification for Private Firms with Public Debt

Industry Classification	Firm-Years	Sample %	Compustat %
Agriculture	36	1.2%	0.4%
Mining & construction	37	1.2%	3.6%
Food	89	3.0%	4.2%
Textiles & Printing/Publishing	370	12.5%	10.1%
Chemicals	142	4.8%	4.9%
Pharmaceuticals	28	0.9%	3.3%
Extractive	61	2.1%	5.7%
Durable Manufacturers	801	27.0%	32.3%
Computers	92	3.1%	8.3%
Transportation	127	4.3%	4.1%
Utilities	0	0.0%	0.1%
Services	703	23.7%	13.6%
Retail	484	16.3%	9.4%
Total Observations	**2,970**		

Industry classification is determined by primary SIC code as follows: Agriculture (0100-0999), Mining & Construction (1000-1999, excluding 1300-1399), Food (2000-2111), Textiles & Printing/Publishing (2200-2780), Chemicals (2800-2824, 2840-2899), Pharmaceuticals (2830-2836), Extractive (2900-2999), 1300-1399), Durable Manufactures (3000-3999, excluding 3570-3579 and 3670-3679), Computers (7370-7379, 3570-3579, 3670-3679), Transportation (4000-4899), Utilities (4900-4999), Retail (5000-5999), and Services (7000-8999), excluding 7370-7379).

Panel C: Frequencies and Sequences of Firms with Private and Public Ownership Phases

	# of Firms with Public and Private	Majority PE-Backed Firms	Minority PE-Backed Firms	Mgmt-Owned Firms	# of Total Firm-Years
Public → Private	87	54	14	19	1,282
Private → Public	120	74	20	26	1,371
Public → Private → Public	53	38	11	4	1,111
Total firms with public debt	260	166	45	49	3,764

Panel D: Frequencies and Sequences of Public and Private Firm-Years

	# of Public Firm-Years	Majority PE-Backed Firms	Minority PE-Backed Firms	Mgmt-Owned Firms	# of Private Firm-Years
Public → Private	789	307	60	126	493
Private → Public	830	311	72	158	541
Public → Private → Public	848	170	56	37	263
Total firms with public debt	2,467	788	188	321	1,297

[a] The sample of "potential" private firms with public debt consists of all firm-year observations on Compustat in any year from 1978 to 2010 that satisfy the following criteria: (1) the firm's stock price at fiscal year-end is unavailable, (2) the firm has total debt as well as total revenues exceeding $1 million, (3) the firm is a domestic company, (4) the firm is not a subsidiary of another public firm, and (5) the firm is not a financial institution or in a regulated industry (SIC codes 6000-6999 and 4800-4900).

[b] Compustat reports three years of historical information for public firms that file for initial public offering. This financial information is taken from the prospectus.

[c] "Other" includes observations of the same firm with different names, firms that do not have information for consecutive years, firms that have joint ventures and partnerships with public firms, holding companies of public firms, and observations with information available only for the years 1978-1979.

[d] Firms that that move from public to private equity ownership (or vice versa) and hence, have both public and private firm-years.

Panel E: Distribution of Firm-Year Observations for Firms with Public Debt and Public Equity

Year	# of Private Firm-Years	# of Public Firm-Years	Year	# of Private Firm-Years	# of Public Firm-Years
1980	4	76	1996	33	113
1981	5	77	1997	32	108
1982	6	81	1998	42	105
1983	7	86	1999	48	98
1984	11	85	2000	58	93
1985	16	86	2001	62	82
1986	32	82	2002	54	84
1987	49	77	2003	56	82
1988	71	66	2004	50	80
1989	104	46	2005	39	85
1990	107	34	2006	23	84
1991	93	48	2007	21	78
1992	76	68	2008	22	70
1993	59	90	2009	18	66
1994	53	96	2010	2	40
1995	44	101	**Total**	**1,297**	**2,467**

TABLE 2
Descriptive Statistics on Ownership, Board Composition, and CEO Characteristics

		PE Majority (1)	PE Minority (2)	Non-PE Backed (3)	Diff (1) – (2)	Diff (1) – (3)	Diff (2) – (3)
No. of Firms		38	38	38			
Ownership							
Owned by PE Firms	Mean	82.7%	31.1%		51.6%***		
	Median	86.1%	32.1%		54.0%***		
Owned by Management	Mean	15.1%	32.6%	69.1%	-17.5%**	-54.0%***	-36.5%***
	Median	6.1%	29.0%	92.0%	-22.9%***	-85.9%***	-63.0%***
Owned by CEO	Mean	7.1%	22.4%	51.0%	-15.3%***	-44.0%***	-28.7%***
	Median	4.0%	14.7%	58.0%	-10.6%***	-54.0%***	-43.4%**
Board							
Insiders	Mean	29.7%	44.7%	59.1%	-15.0%***	-29.4%***	-14.3%**
	Median	28.6%	42.9%	50.0%	-14.3%***	-21.4%***	-7.1%*
PE Firm Representatives on Board	Mean	62.4%	39.2%		23.2%***		
	Median	63.6%	42.9%		20.8%***		
Chair is PE	Mean	28.9%	47.8%		-18.9%		
CEO is Chair	Mean	48.9%	69.6%	65.7%	-20.7%*	-16.8%	3.9%
CEO is Director	Mean	91.1%	95.7%	94.3%	-4.6%	-3.2%	1.4%
Board Size	Mean	7.1	5.9	5.9	1.2**	1.2*	-0.1
	Median	7.0	6.0	5.0	1.0**	2.0**	1.0
CEO							
CEO Has an MBA	Mean	62.5%	55.6%	66.7%	6.9%	-4.2%	-11.1%
CEO Has Finance Background	Mean	17.8%	26.1%	5.7%	-8.3%	12.1%*	20.4%**
CEO Years with the Firm	Mean	8.2	11.2	18.7	-3.0	-10.5***	-7.5***
	Median	6.0	10.0	15.0	-4.0*	-9.0***	-5.0**
CEO Has Stock Options	Mean	71.1%	60.9%	31.4%	10.2%	39.7%***	29.4%**
CEO Nominated by PE	Mean	57.8%	43.5%		14.3%		

*,**,*** indicates significance at the 10%, 5%, and 1% level, respectively. Differences in means are tested for significance using a two-tailed t-test; differences in medians are tested for significance using a two-tailed Wilcoxon signed rank test. Insiders equals the number of directors who serve as executives in the firm divided by total board size; PE Firms' Rep. equals the number of directors who represent PE firms divided by total board size; Chair is PE is the percentage of firms for which the chairman is also a general partner of the PE firm; CEO is Chair is the percentage of firms for which the CEO is the chairman of the board of directors; CEO is Director is the percentage of firms for which the CEO is a director (including chair) of the board of directors; Board Size is the total number of directors on the board; CEO has an MBA is the percentage of firms for which the CEO hold an MBA degree; CEO has Finance Background is the percentage of firms for which the CEO has past experience as investment banker, CFO, have a CPA or is a partners in a PE firm; CEO has Stock Options is the percentage of firms for which the CEO received stock options as part of her/his compensation package; CEO Nominated by PE is the percentage of firms for which the CEO is was either nominated or is affiliated with the PE firm owner.

TABLE 3
Descriptive Statistics that Compare PE-Backed Private Firms (Upper Rows, in Bold) to Non-PE-Backed, Propensity Score Matched Private Firms (Lower Rows, No Bold)

Panel A: Descriptive Statistics for Regression Variables

	# Obs	25th Percentile	Mean	Median	75th Percentile	Standard Deviation	Difference between: Mean	Difference between: Median
RNOA	**448**	**0.072**	**0.130**	**0.114**	**0.186**	**0.121**	0.009	0.002
	448	0.065	0.122	0.111	0.165	0.114		
LOSS	**448**	**0.000**	**0.371**	**0.000**	**1.000**	**0.483**	-0.013	0.000
	448	0.000	0.384	0.000	1.000	0.496		
NOL	**448**	**0.000**	**0.291**	**0.000**	**1.000**	**0.455**	0.018	0.000
	448	0.000	0.273	0.000	1.000	0.446		
LEV	**448**	**0.457**	**0.624**	**0.611**	**0.763**	**0.306**	-0.001	-0.005
	448	0.447	0.625	0.616	0.779	0.319		
INTANG	**448**	**0.000**	**0.188**	**0.090**	**0.356**	**0.248**	0.009	0.013
	448	0.000	0.179	0.077	0.253	0.253		
MNC	**448**	**0.000**	**0.426**	**0.000**	**1.000**	**0.495**	0.025	0.000
	448	0.000	0.400	0.000	1.000	0.490		
AB_ACCR	**448**	**-0.042**	**-0.010**	**-0.006**	**0.021**	**0.075**	0.001	-0.001
	448	-0.042	-0.011	-0.005	0.020	0.064		
EQ_EARN	**448**	**0.000**	**0.000**	**0.000**	**0.000**	**0.004**	-0.001	0.000
	448	0.000	0.001	0.000	0.000	0.015		
SALES_GR	**448**	**-0.032**	**0.215**	**0.032**	**0.137**	**0.780**	-0.051	0.001
	448	-0.012	0.266	0.031	0.124	0.873		
ASSETS	**448**	**5.263**	**5.870**	**5.829**	**6.354**	**1.312**	-0.055	-0.011
	448	5.212	5.925	5.840	6.597	1.150		
SOX	**448**	**0.000**	**0.249**	**0.000**	**0.000**	**0.433**	-0.005	0.000
	448	0.000	0.254	0.000	1.000	0.436		

Panel B: Descriptive Statistics for Measures of Tax Avoidance

	# Obs	25th Percentile	Mean	Median	75th Percentile	Standard Deviation	Difference between: Mean	Difference between: Median
GAAP_ETR	**305**	**0.220**	**0.303**	**0.322**	**0.481**	**0.172**	-0.030**	-0.031**
	280	0.121	0.333	0.353	0.442	0.260		
CASH_ETR	**265**	**0.088**	**0.267**	**0.269**	**0.498**	**0.184**	-0.097***	-0.051***
	221	0.108	0.364	0.320	0.543	0.306		
DTAX	**448**	**-0.015**	**0.078**	**0.009**	**0.062**	**0.271**	0.054***	0.009**
	448	-0.034	0.023	0.000	0.037	0.232		
SHELTER	**448**	**-1.832**	**-0.986**	**-1.205**	**-0.536**	**0.961**	0.229***	0.069***
	448	-2.038	-1.216	-1.273	-0.349	1.466		

*,**,*** indicates significance at the 10%, 5%, and 1% level, respectively. Differences between means are tested for significance using a two-tailed t-test; differences in medians are tested for significance using a two-tailed Wilcoxon signed rank test. All variables are as defined in the Appendix. All continuous variables are winsorized at the 1st and 99th percentile.

Panel C: Pearson (Spearman) Correlation Coefficients for *PE_BACKED* and Measures of Tax Avoidance

	PE_BACKED	*GAAP_ETR*	*CASH_ETR*	*DTAX*	*SHELTER*
PE_BACKED	---	-0.086**	-0.101**	0.107***	0.092***
GAAP_ETR	-0.062**	---	0.415***	-0.020*	-0.052*
CASH_ETR	-0.131***	0.440***	---	0.014	-0.073*
DTAX	0.126***	-0.033*	0.019	---	0.038
SHELTER	0.072***	-0.051*	-0.039	0.084***	---

*,**,*** indicates significance at the 10%, 5%, and 1% level using a two-tailed test, respectively. All variables are as defined in the Appendix.

TABLE 4
Results for Tax Avoidance Regressions Based on Samples of PE-Backed and Non-PE-Backed, Propensity Score Matched Private Firms

	GAAP_ETR		*CASH_ETR*		*DTAX*		*SHELTER*	
	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat
Intercept	0.418	9.007	0.365	5.665	0.018	0.494	-0.833	-12.283
PE_BACKED	**-0.018***	**-1.815**	**-0.093*****	**-4.418**	**0.059*****	**3.635**	**0.173****	**2.512**
RNOA	-0.066	-0.785	0.016	0.153	-0.005	-0.266		
LOSS	0.043	1.701	0.060	1.857	0.060	3.032	-1.140	-16.059
NOL	-0.023	-1.176	0.015	0.672	0.047	1.805	0.016	0.213
LEV	-0.041	-1.403	-0.020	-0.489	0.078	3.357		
INTANG	-0.009	-0.235	0.042	0.997			-0.114	-0.679
MNC	0.076	4.637	0.092	4.614	0.107	1.164		
AB_ACCR	-0.004	-0.027	-0.020	-0.111	0.011	0.619		
EQ_EARN	-0.707	-1.209	-0.013	-0.011			5.118	1.399
SALES_GR	-0.006	-0.729	-0.028	-2.329	0.002	0.233	0.130	1.874
ASSETS	-0.012	-1.649	-0.008	-0.910	0.313	2.096		
SOX	-0.051	-2.381	-0.027	-1.141	-0.012	-2.085	0.349	4.190
INV_MILLS	0.019	1.073	0.011	0.795	0.032	0.928	0.013	0.774
Adjusted R^2	0.0735		0.1031		0.0718		0.2538	
N	585		486		896		896	

*,**,*** indicates significance at the 10%, 5%, and 1% level using a two-tailed t-test , respectively. Regressions include industry and year indicator variables, which have not been tabulated. The t-stats have been adjusted to control for the clustering by multiple firm observations. All variables are as defined in the Appendix.

TABLE 5
Summary of Results for Tax Avoidance Regressions Based on Sub-Samples of PE-Backed and Non-PE-Backed Private Firms

	GAAP_ETR		*CASH_ETR*		*DTAX*		*SHELTER*	
	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat
Owned by PE Firm with Many vs. Few Portfolio Firms:								
MANY_PORTFOLIO_FIRMS	**-0.037****	**-2.743**	**-0.028***	**-1.954**	**0.034**	**1.639**	**0.211*****	**3.926**
Adjusted R^2	0.0764		0.0573		0.0479		0.2160	
N	1,174		1,058		1,911		1,911	
Owned by Large vs. Small PE Firms:								
LARGE_PE_FIRMS	**-0.044*****	**-3.372**	**-0.050*****	**-3.700**	**0.023***	**1.823**	**0.372*****	**7.550**
Adjusted R^2	0.0804		0.0662		0.0489		0.2386	
N	1,174		1,058		1,911		1,911	
Majority-Owned PE-Backed Private Firms vs. Minority-Owned PE-Backed Private Firms:								
MAJORITY_PE_BACKED	**-0.027***	**-1.980**	**-0.040****	**-2.391**	**0.055*****	**4.106**	**0.088***	**1.850**
Adjusted R^2	0.0733		0.0595		0.0527		0.2114	
N	1,174		1,058		1,911		1,911	
Management-Owned vs. Employee-Owned Private Firms:								
EMPLOYEE_OWNED	**-0.015**	**-1.628**	**-0.041***	**-1.743**	**0.035**	**1.482**	**0.580*****	**5.557**
Adjusted R^2	0.1285		0.1040		0.0387		0.2800	
N	768		559		997		997	

*,**,*** indicates significance at the 10%, 5%, and 1% level using a two-tailed t-test , respectively. Regressions include the following control variables: *RNOA, LOSS, NOL. LEV, INTANG, MNC, AB_ACCR, EQ_EARN, SALES_GR, ASSETS, SOX, INV_MILLS, INDUS*, and *YEAR* variables, which have not been tabulated. The t-stats have been adjusted to control for the clustering by multiple firm observations. All variables are as defined in the Appendix.

TABLE 6
Difference-in-Difference Analysis of PE-Backed and Non-PE-Backed, Small- and Large-Sized Private Firms, where Small- (Large-) Sized Private Firms are in the Bottom (Top) Quartile of Net Sales for All Private Firms

Panel A: Univariate Analysis

	Small-Sized PE-Backed				Small-Sized Non-PE-Backed				Difference	
	Obs	Mean	Median	St. Dev.	Obs	Mean	Median	St. Dev.	Mean	Median
GAAP_ETR	233	0.302	0.330	0.171	197	0.347	0.367	0.226	-0.045***	-0.037***
CASH_ETR	191	0.242	0.219	0.195	114	0.336	0.331	0.292	-0.094***	-0.112***
DTAX	446	0.080	0.010	0.304	280	0.032	0.000	0.201	0.048**	0.010
SHELTER	446	-1.605	-1.833	0.619	280	-2.067	-2.068	1.110	0.462***	0.235***
	Large-Sized PE-Backed				Large-Sized Non-PE-Backed				Difference	
	Obs	Mean	Median	St. Dev.	Obs	Mean	Median	St. Dev.	Mean	Median
GAAP_ETR	287	0.300	0.342	0.176	252	0.328	0.371	0.173	-0.028*	-0.029*
CASH_ETR	260	0.284	0.287	0.184	206	0.315	0.317	0.208	-0.031*	-0.030*
DTAX	442	0.032	0.003	0.272	284	-0.003	0.000	0.174	0.035**	0.003
SHELTER	442	-0.275	-0.349	1.060	284	0.724	0.741	1.329	-0.999***	-1.090***

	Difference-in-Difference	
	Mean	Median
GAAP_ETR	-0.017	-0.008
CASH_ETR	-0.063***	-0.082***
DTAX	0.013	0.007
SHELTER	1.461***	1.325***

*,**,*** indicates significance at the 10%, 5%, and 1% level. Differences between means are tested for significance using a two-tailed t-test; differences in medians are tested for significance using a two-tailed Wilcoxon signed rank test. All variables are as defined in the Appendix.

TABLE 6 – CONTINUED

Panel B: Summary of Regression Results for Difference-in-Difference Analysis

	GAAP_ETR		*CASH_ETR*		*DTAX*		*SHELTER*	
	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat
PE_BACKED×SMALL-SIZE	0.320***	8.443	0.164***	3.155	0.064*	1.892	-1.120***	-18.188
NON_PE_BACKED×SMALL-SIZE	0.364***	11.105	0.267***	5.815	-0.016	-0.493	-1.822***	-30.351
PE_BACKED×LARGE-SIZE	0.309***	5.911	0.172**	2.643	0.030	1.566	0.108	1.626
NON_PE_BACKED×LARGE-SIZE	0.336***	6.033	0.203***	2.920	-0.006	-1.239	0.779***	10.275
Adjusted R^2	0.7750		0.6723		0.0750		0.6837	
N	969		771		1,452		1,452	

Tests for Differences:

PE_BACKED×SMALL-SIZE − *NON_PE_BACKED×SMALL-SIZE*	-0.044	-0.102	0.080	0.701
PE_BACKED×LARGE- SIZE − *NON_PE_BACKED×LARGE-SIZE*	-0.027	-0.031	0.036	-0.670
Difference	-0.018	-0.071	0.044	1.371
F-test (p-value)	0.078†	0.033††	0.205	0.001†††

*,**,*** indicates significance at the 10%, 5%, and 1% level using a two-tailed t-test , respectively. †,††,††† indicates significant at the 10%, 5%, and 1% level based on an F-test. Regressions include the following control variables: *RNOA, LOSS, NOL. LEV, INTANG, MNC, AB_ACCR, EQ_EARN, SALES_GR, ASSETS, SOX, INV_MILLS, INDUS*, and *YEAR* variables, which have not been tabulated. The t-stats have been adjusted to control for the clustering by multiple firm observations. All variables are as defined in the Appendix.

TABLE 7
Summary of Results for Tax Avoidance Regressions Based on Sub-Samples of Private and Propensity Score Matched Public Firms

	GAAP_ETR		*CASH_ETR*		*DTAX*		*SHELTER*	
	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat
Non-PE-Backed Private Firms vs. Propensity Score Matched Public Firms:								
NON_PE_BACKED	**0.012**	**1.663**	**0.042****	**2.072**	**-0.043****	**-2.161**	**-0.217****	**-2.303**
Adjusted R^2	0.0729		0.0753		0.0447		0.3227	
N	1,079		939		1,362		1,362	
PE-Backed Private Firms vs. Propensity Score Matched Public Firms:								
PE_BACKED	**0.015**	**1.562**	**0.020**	**1.654**	**-0.022**	**-1.580**	**-0.089***	**-1.933**
Adjusted R^2	0.0433		0.0673		0.0329		0.2790	
N	1,599		1,480		2,378		2,378	
Majority-Owned PE-Backed Private Firms vs. Propensity Score Matched Public Firms:								
MAJORITY_PE_BACKED	**0.009**	**1.073**	**0.014**	**1.218**	**-0.016**	**-1.322**	**-0.071**	**-1.301**
Adjusted R^2	0.0507		0.0781		0.0370		0.2910	
N	1,296		1,203		1,880		1,880	
Minority-Owned PE-Backed Private Firms vs. Propensity Score Matched Public Firms:								
MINORITY_PE_BACKED	**0.031****	**2.310**	**0.030***	**1.976**	**-0.033***	**-1.727**	**-0.159****	**-2.083**
Adjusted R^2	0.0832		0.1147		0.0356		0.0878	
N	303		277		498		498	

*,**,*** indicates significance at the 10%, 5%, and 1% level using a two-tailed t-test , respectively. Regressions include the following control variables: *RNOA, LOSS, NOL. LEV, INTANG, MNC, AB_ACCR, EQ_EARN, SALES_GR, ASSETS, SOX, INV_MILLS, INDUS*, and *YEAR* variables, which have not been tabulated. The t-stats have been adjusted to control for the clustering by multiple firm observations. All variables are as defined in the Appendix.

TABLE 8
Analysis of Items that Cause *GAAP_ETR* to Differ from the Statutory Tax Rate for PE-Backed and Non-PE-Backed Private Firms

Statutory Reconciliation Items:	PE-Backed Firms (N = 73)	Non-PE-Backed Firms (N = 36)	T-Statistic for Difference
Foreign Tax Rate Differential			
Mean	-0.042	-0.002	-1.17
Median	0.000	0.000	-0.49
State Tax Rate Differential			
Mean	0.012	0.016	-0.14
Median	0.008	0.011	0.47
Intangible Assets			
Mean	-0.020	0.038	-2.15**
Median	-0.000	0.000	-2.41**
Tax-Exempt Income Items			
Mean	-0.013	0.012	-2.17**
Median	0.000	0.000	-1.72*
Nondeductible Expenses			
Mean	0.013	0.001	1.74*
Median	0.000	0.000	0.06
Change in Tax Reserve			
Mean	0.010	0.003	0.72
Median	0.000	0.000	1.08
Tax Credits			
Mean	-0.021	-0.001	-2.52**
Median	0.000	0.000	-0.03
Other Items			
Mean	0.014	0.001	0.34
Median	0.000	0.003	0.47

*,**,*** indicates significance at the 10%, 5%, and 1% level. Differences between means are tested for significance using a two-tailed t-test; differences in medians are tested for significance using a two-tailed Wilcoxon signed rank test.

TABLE 9
Subsidiary and Tax Haven Analyses Based on PE-Backed and Non-PE-Backed Firms

	Number of Observations	Number of Subsidiaries		Number of Subsidiaries in Tax Havens		Number of Countries	
		Mean	Median	Mean	Median	Mean	Median
PE_BACKED	465	19.87	7	3.01	1	6.83	4
NON_PE_BACKED	221	14.04	5	2.38	1	7.68	3
Difference		**5.83****	**2***	**0.63***	**0**	**-0.85**	**1**
MANY_PORTFOLIO_FIRMS	76	28.23	6	3.57	0	7.22	3
FEW_PORTFOLIO_FIRMS	389	17.55	8	2.79	1	7.55	4
Difference		**10.68*****	**-2**	**0.78**	**-1**	**-0.33**	**-1**
LARGE_PE_FIRM	194	25.23	9	3.97	1	8.14	4.5
SMALL_PE_FIRM	271	13.19	6	1.83	0	5.89	3
Difference		**12.04****	**3*****	**2.14*****	**1*****	**2.25*****	**1.5*****
MAJORITY_PE_BACKED	433	19.54	7	3.02	1	7.46	4
MINORITY_PE_BACKED	32	16.64	11	1.53	1	8	7
Difference		**2.9**	**-4**	**1.49****	**0**	**-0.54**	**-3**
MANAGEMENT_OWNED	93	11.56	6	1.97	0	6.01	4
EMPLOYEE_OWNED	128	11.86	6	1.86	0	6.89	3
Difference		**-0.3**	**0**	**0.107**	**0**	**-0.88**	**1**

*,**,*** indicates significance at the 10%, 5%, and 1% level. Differences between means are tested for significance using a two-tailed t-test; differences in medians are tested for significance using a two-tailed Wilcoxon signed rank test. All variables are as defined in the Appendix.