Private versus public corporate ownership: Implications for future profitability

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ABSTRACT

The advantages and disadvantages of public versus private corporate ownership have long been debated; however, little empirical research has provided insight into the issue. We investigate the consequences of public versus private ownership on future profitability by examining a large cross-section of public and private firms as well as a propensity-matched sample of public and private firms. We find robust evidence that public firms are associated with significantly lower operating profitability three and five years into the future when compared with private firms and that the differential future profitability is driven primarily by future profit margins. We also find that the association between the lower future profitability of public firms is more pronounced for firms in short-term focused and highly competitive industries. Finally, we find that public firms are associated with smoother future earnings than private firms. The results provide insight into the differential future profitability of public versus private firms and the factors that influence the differential profitability.

Keywords: private firms, profitability, future performance, short-termism, and ownership structure

JEL classification: M41, M42, M44

Data Availability: Data are available from sources identified in the paper.

I. INTRODUCTION

"As a private company, Dell now has the freedom to take a long-term view. No more pulling R&D and growth investments to make in-quarter numbers…No more trade-offs between what's best for a short-term return and what's best for the long-term success of our customers."(Michael Dell, Dell Inc. in the Wall Street Journal, Nov. 24, 2014)

The advantages and disadvantages of public corporate ownership have been debated for years (Berle and Means 1932). Public ownership generally allows for greater access to credit, enhanced stock-based management compensation packages, external monitoring of the business, and greater publicity for the firm. These advantages of public ownership have the potential to increase investment opportunities without increased indebtedness, attract the best employee talent, and lead to an enhanced reputation relative to what would be possible if the firm were private. On the other hand, there are potential disadvantages of public ownership. The diffuse ownership and separation of ownership from control potentially creates agency problems such that the actions are not in the firm's long-term best interest. Thus, compensation-based and market-based incentives that emphasize short-term rewards can lead to suboptimal decisions for the future (i.e., long-run) profitability of the firm. Additionally, public ownership requires disclosure of firm information which may be used strategically by current and potential rivals. These disclosures as well as the costs of complying with regulatory requirements may diminish the competitiveness and long-run profitability of public firms relative to private firms.

Many studies report that a propensity to go private spiked after the Sarbanes-Oxley Act (SOX) of 2003 (Engel, Hayes, and Wang 2007; Kamar, Karaca-Mandic, and Talley 2009; Leuz, Triantis, and Wang 2008). Specifically, Leuz et al. (2008) document that many firms chose to "go dark" (i.e., deregister their common stock) after SOX: 370 from 2002 through 2004 versus 114 from 1998 through 2001. With several large publicly traded firms going private recently, the

sense is that firms that go private are "in the vanguard of an accelerating trend of businesses walking away from the stock markets" (Banks 2014). As further evidence of the recent preference of firms to remain private instead of going public, private financing with at least $1 billion valuations were four times as common through the first half of 2014 as initial public offerings (IPOs) with similar market capitalizations. This reflects the widest gap on record between the number of private financings and IPOs for billion-dollar firms (Chernova 2014).

Despite the debate in both practice and academics regarding the effect of public versus private ownership on firm performance, little empirical research has examined this issue. The lack of empirical evidence is likely due to the lack of data on private firms. In this study, we provide empirical evidence on the relative future profitability of private and public firms by using data from Sageworks. We first examine whether public firms are associated with significantly lower operating profitability (return on net operating assets) when compared with private firms one, three, and five years into the future after controlling for current profitability, growth, and the components of current profitability for the entire cross-section of available firms. In order to further document that our results are due to public versus private ownership and not to other factors, we also apply a rigorous propensity score matching (PSM) procedure to identify a more refined sample of public and private firms. Our results for both the full and PSM samples suggest that public firms are associated with significantly lower return on net operating assets three and five years ahead than their private counterparts.

We then examine whether the lower future profitability of public firms is associated with lower future profit margins and/or asset turnover. The cost of regulation for public firms, especially since the implementation of SOX, and SEC disclosure requirements can diminish the competitiveness of public corporations. These effects could lead to lower future profit margins

for public firms relative to private firms. Asset turnover could also differ between public and private firms. Public firms could experience higher future asset turnover if they have greater access to capital and are better able to invest in positive net present value projects. However, public firms could experience lower asset turnover if their access to capital leads to overinvestment or if public pressure to meet short-term goals leads to over- or under-investment. Asker et al. (2014) examine differences in investment between public and private firms. They find that public firms invest substantially less and are less responsive to changes in investment opportunities. This suggests that any differences in profitability between public and private firms could be attributable to asset turnover. In contrast, our findings, which examine private and public performance over a long window horizon, indicate an association between lower future profit margins for public versus private firms but no differences in future asset turnover. These findings suggest that the lower profit margins for public versus private firms are the primary driver of the long-run profitability differences observed in the return on net operating assets analysis.

We also examine the role that industry dynamics plays on the differential profitability of public versus private firms. Thus, we examine situations in which industry characteristics might exacerbate or mitigate the differences we observe in our initial investigation on public and private firm profitability. Specifically, we examine whether the overall difference observed in the future profitability of public and private firms varies based on industry "short-termism" and competition. Many have argued that public corporations exhibit short-termism, a tendency to take actions that maximize short-term earnings and stock prices rather than the long-term value of the corporation (e.g., Levitt 2000; Donaldson 2003).[1] While there is anecdotal evidence of

[1] Other researchers (e.g., Laverty 2004; Edmans, Goodstein, and Wei 2009; and Asker, Farre-Mensa, and Ljungqvist 2014) have labeled this tendency "managerial myopia," defined as the tendency for companies to take actions that

economic short-termism by public corporations, there is little empirical evidence on whether short-termism leads to lower future profitability for public firms relative to private firms. Utilizing the classification in Brochet, Loumioti, and Serafeim (2014), in which specific industries are designated as being short-term oriented by senior level emphasis on the short-term in conference calls, we find evidence suggesting that the positive association between future profitability and private firms relative to public firms is more pronounced in industries that are classified as short-term focused. Public ownership also requires increased disclosures about firm profitability. The increased disclosures likely expose information to competitors that could negatively affect the disclosing firms' future profitability (Berman 2011; Badertscher, Shroff, and White 2013). This would be most costly in industries that are highly competitive. Consistent with this notion, we find evidence that the lower future profitability of public firms relative to private firms is more pronounced in more competitive industries.

Finally, we examine whether public firms have less variation in their reported earnings than private firms. In a survey of more than 400 executives, Graham, Harvey, and Rajgopal (2005) report, "predictability of earnings is an over-arching concern among CFOs" and "executives believe that less predictable earnings…command a risk premium in the market." We examine the variability of earnings over the three and five years after the year of the initial matching and find that public firms are associated with lower variability of earnings relative to private firms. Our finding of smoother income combined with our finding of lower future profitability for public firms relative to private firms is in line with the Graham et al. (2005)

overvalue short-term rewards and undervalue long-term consequences. Managerial myopia is usually attributed to short-sighted decision making by managers due to the pressures of the stock market. For simplicity, we refer to actions that overvalue short-term rewards and undervalue long-term consequences as short-termism throughout the paper and do not make a distinction between short-termism and managerial myopia.

survey that “an astonishing 78 percent [of executives] admit that they would sacrifice a small, moderate, or large amount of value to achieve a smoother earnings path.”

The results of our study provide empirical evidence and important insights that could aid managers, lenders, and equity providers of both private and public firms in understanding some of the costs and benefits associated with public ownership. Our results are consistent with public firms experiencing lower future profitability than private firms and with the differential future profitability being associated with industry short-termism, industry competition, and financial reporting pressures to report smooth earnings. Our findings also provide insights to aid managers of public firms in identifying factors that likely reduce their profitability relative to private firms and suggest that the greater long-run future profitability associated with private firms is driven primarily by future profit margins not by asset turnover, as earlier work might suggest (e.g., Asker et al. 2014).

This study also contributes to the literature on the effect of ownership structure on firm performance. Prior research has examined the relation between current profitability and specific ownership structures within public firms (Demsetz and Lehn 1985; Demsetz and Villalonga 2001); however, the research does not provide evidence regarding the overall effect of public versus private ownership on current or future profitability. The research that has examined the differential profitability between public and private firms provides mixed evidence (Coles, Lemmon, and Naveen 2013; Ke, Petroni, and Safieddine 1999) and is limited to the insurance industry and survey data. Other research has attempted to provide insight into the effect of private versus public ownership by examining firm performance before and after an in IPO (Pagano, Panetta, and Zingales 1998; Jain and Kini 1994; Mikkelson, Partch, and Shah 1997) or a public offering via a reverse leveraged buyout (DeGeoge and Zeckhauser 1993); however,

these actions lead to an infusion of capital into the firm. We contribute to this literature by exploiting a unique private firm financial database and by examining the future profitability of a matched sample of public and private firms outside of the specific settings.

This study also contributes to the debate on economic short-termism. Short-termism has been blamed for the economic malaise that has affected the U.S. for several decades (Laverty 1996) and for playing a significant role in the recent financial crisis (Bair 2011). While researchers have tried to document short-termism and its effect on corporations, the evidence remains limited (Stein 2003). Recent analytical research by Gigler, Kanodia, Sapra, and Venugopalan (2012) demonstrates that less frequent reporting could limit managerial short-termism because information has strategic consequences. Thus, private firms, which arguably have fewer reporting requirements than public firms, may experience less dysfunctional behavior and fewer value-destroying actions. Using a novel dataset to compare public corporations to private corporations, we provide insight into the short-termism debate by documenting that the relatively lower future profitability of public firms versus private firms is more pronounced when the firm is in a short-term oriented industry.

Finally, our paper contributes to the emerging literature on private firms. Allee and Yohn (2009) and Minnis (2011) find that private firms benefit from audited financial statements and the use of accrual-based accounting in the form of greater access to credit and a lower cost of credit. Brav (2009) finds that private firms in the U.K. rely almost exclusively on debt financing. Asker et al. (2014) compare investment decisions of public and private firms. Maksimovic, Phillips, and Yang (2013) show that public firms increase the productivity of the assets they purchase to a greater extent than private firms. Hope, Thomas, and Vyas (2013) find that private firms have lower financial reporting quality than public firms. We contribute to this body of

research by documenting differential future profitability between public and private firms. Additionally, we attempt to address econometric issues that are discussed, but not addressed, in prior studies. For example, our research design addresses the self-selection issue related to public versus private ownership by propensity score matching each private firm on known factors that differ between public and private firms as well as by implementing a Heckman (1979) model.

II. BACKGROUND AND RESEARCH QUESTIONS

Prior Literature

There is a long history of academic research that attempts to provide insight into the effect of ownership structure on firm performance. Much of the research has examined the association between specific ownership characteristics and firm performance. For example, Himmelberg, Hubbard, and Palia (1999) and Demsetz and Lehn (1985) find no relation between return on assets and managerial ownership. Demsetz and Villalong (2001) find no relation between various ownership structure characteristics and firm performance. Holderness and Sheehan (1988) and Denis and Denis (1994) find no association between firm performance and the diffusion of ownership. Other research has examined specific costs associated with ownership structure. For example, Ang, Cole, and Lin (2000) find that agency costs increase with non-managerial ownership.

Research has also examined the performance of firms after an IPO to assess the association between public ownership and firm performance. For example, Pagano et al. (1998) find a reduction in the profitability of firms after an IPO for a sample of Italian firms. Jain and Kini (1994) find a reduction in operating profitability after an IPO for a sample of U.S. firms. Mikkelson et al. (1997) find reduced profitability from prior to the IPO to the end of the first

year after the public offering for a sample of U.S. firms, but find no further decline in profitability for the ten years after the public offering. DeGeorge and Zeckhauser (1993) find a reduction in firm performance after firms go public through a reverse leveraged buyout.

While these studies provide insight into whether specific ownership characteristics are associated with firm performance or whether having an IPO is associated with a change in profitability, it is difficult to assess whether public firms are associated with differential future profitability relative to private firms. Research on specific ownership characteristics and firm performance cannot provide insight into the overall effect of public versus private ownership on firm performance. In addition, research on changes in firm performance around public offerings is unable to provide insight into whether there are differences in firm performance between public and private firms in a more stable environment when there is not a significant inflow of capital. A more direct empirical comparison of future profitability between private versus public firms would provide insight into this issue. However, difficulty in obtaining private firm data has likely led to a lack of research in this area.

Some studies have overcome the data problem by focusing on regulated industries, such as banking and insurance firms, or using data collected from surveys of private firms. For example, Ke et al. (1999) perform a univariate comparison of a sample of 45 privately-held property-liability insurers and 18 publicly-held property-liability insurers, and detect no significant difference in profitability between public and private firms. However, this analysis examines a small, unbalanced sample of firms within one industry. Using the *Forbes* survey of the 500 biggest private firms in the U.S., Coles et al. (2013) find that private firms are less profitable than similar public firms, when profitability is measured as operating margin and profit margin. However, Coles et al. (2013) use Forbes estimated data and do not employ a

matched pair research design. We contribute to this literature by presenting empirical evidence on differences in future profitability between a matched sample of private and public firms in a cross-section of industries over a multi-year period.

Research Questions

The public corporation is believed to have numerous advantages over its private counterpart (Renneboog, Simons, and Wright 2007). For example, public firms are likely to invest more due to greater access to capital. Additionally, public firms have access to greater publicity and an increased reputation. Public firms have increased ability to use stock price-based compensation packages that can attract the best employee and management talent. All of these factors could result in public firms outperforming private firms in terms of future profitability.

On the other hand, there have been arguments that public firms may be less profitable in the long-run than private firms. The agency conflicts associated with disperse ownership and the separation of ownership from control may lead to actions that are not in the long-term best interest of the firm (Berle and Means 1932). Detailed disclosure requirements for public firms may also hinder profitability (Pagano and Roell 1998). In fact, Brau and Fawcett (2006) find, in a survey of CFOs, that "disclosing information to competitors" and "SEC reporting requirements" are among the five most important reasons why U.S. private firms remain private. Thus, firms organized as private firms may have distinct long-run advantages over public firms due to the greater exposure of public firm corporate strategies and trade secrets (Badertscher et al. 2013). In addition, the cost of regulation, especially since the implementation of SOX, can hinder profitability. CFOs surveyed by Brau and Fawcett (2006) suggest that expenses associated with listing requirements imposed by securities exchanges, SEC rules and regulations, and

accounting requirements for public firms, estimated nearly a decade ago at over a million dollars annually, can affect long-run profitability (Hartman 2006).

In summary, there are valid reasons to expect public ownership to enhance a firm's performance and many credible arguments to suggest that public ownership may hinder profitability. This leads to our first research question:

> *RQ1*: Is there a difference in the future operating profitability of private firms relative to public firms?

Operating profitability, defined as return on net operating assets, is a multiplicative function of the firm's profit margin and asset turnover (Fairfield and Yohn 2001). Public ownership could affect the two components of profitability differentially. On the one hand, public ownership and greater access to capital could lead to higher profit margins as public firms are often more highly publicized and customers may view their public status as a sign of quality and, therefore, be willing to pay more for their products. Additionally, Atanassov, Nanda, Vikram, and Seru (2007) document that firms with an infusion of arm's length financing in the form of a seasoned equity offering are associated with an increase in innovative activity (i.e., as measured by the number of citations per patent) within two years after the influx of capital. This increase in innovative activity could lead to higher profit margins for these public firms. On the other hand, public firms face costly regulatory requirements that could diminish their competitiveness. Also, public ownership requires increased disclosures about the costs and profitability of individual segments. The increased disclosure requirements are likely to expose information on margins to competitors (Berman 2011; Badertscher et al. 2013). This suggests that public ownership might lead to greater competition in high margin products, which may eventually lead to lower margins for public firms relative to private firms.

Asset turnover could also differ between public and private firms. On the one hand, public firms could experience higher asset turnover if public firms have greater access to capital and invest the capital in positive net present value projects that incrementally generate more sales. On the other hand, public firms could experience lower asset turnover if they use the greater capital base to overinvest in projects such that each incremental dollar of investment in net operating assets generates fewer sales. Prior research suggests that public firms have the potential to overinvest because of the greater access to capital, to underinvest to ensure that the firm's earnings meet analyst expectations (Graham et al. 2005), or to choose less profitable investments with shorter time horizons (Poterba and Summers 1995). Asker et al. (2014) examine differences in investment between public and private firms and find that public firms invest substantially less and are less responsive to changes in investment opportunities. Suboptimal investments would lead to lower future asset turnover for public firms relative to private firms. These potential effects of private versus public ownership on the components of profitability lead to our second research question:

RQ2: Is there a difference in the future profit margin and/or asset turnover of private firms relative to public firms?

Industry dynamics may have an effect on the differential profitability of public and private firms. Many have argued that public corporations exhibit short-termism, a tendency to take actions that maximize short-term earnings and stock prices rather than the long-term value of the corporation (e.g., Dell 2014; Levitt 2000; Donaldson 2003). Short-termism is a form of managerial myopia in which a manager focuses on short-term profits and stock price instead of long-run firm value. This focus may distort decision making because the manager derives utility from the current stock value. The short-term focused manager, therefore, makes decisions to boost the current stock price potentially to the detriment of long-term profitability and value.

Some have argued that organizing as a private firm avoids some of the pressures of myopic investment decisions due to demands from short-term oriented investors (Stein 1988).[2] Empirical evidence is consistent with this argument. For example, Beatty, Ke, and Petroni (2002) compare samples of publicly and privately held banks. They hypothesize that public banks' diffuse shareholders are more likely than private banks' more concentrated shareholders to rely on simple earnings-based heuristics in evaluating firm performance. Based on this, the authors predict that public bank managers face more pressure than private bank managers to report earnings in line with expectations, and find evidence consistent with their predictions.

There is also anecdotal evidence of concerns about economic short-termism by public corporations. For example, Warren Buffett has demonstrated a preference for investments in private firms because of the short-termism associated with public ownership. In a discussion of Warren Buffett's letter to Berkshire Hathaway shareholders, Hough (2011) states that "Wall Street's short-sighted focus on stock earnings hinders firm performance, whereas private companies are free to prosper." Google (2004) highlights a similar notion prior to its IPO that "outside pressures too often tempt [public] companies to sacrifice long-term opportunities to meet quarterly market expectations." While anecdotal evidence abounds, there is little direct empirical evidence on whether short-termism actually leads to lower future profitability for public firms relative to private firms. Research by Brochet et al. (2014) designates industries as having a short-term or long-term orientation. We argue that if managers of public firms are more susceptible to short-termism than managers of private firms, then we would expect short-termism

[2] Charles Koch, chief executive of Koch Industries Inc., the United States' second-largest private firm, claims that executives that obsess about delivering those "ever-increasing and predictable quarterly earnings" are "going to sacrifice long-term value" in the end (Shlaes 2007).

faced by an industry to affect the differential future profitability of public firms versus private firms in that industry.

We also examine the effect of industry competition on the differential future profitability of public and private firms. Competition should drive rates of return to converge within an industry over time and the rate of convergence should be faster in more competitive industries (Mueller 1977). However, the degree to which industry competitiveness drives convergence in profitability depends on the information environment within that industry (Wagenhofer 1990; Botoson and Stanford 2005). Information about the market for a firm's products and the inherent profitability of selling those products is highly relevant to the firm's competitors. Publicly traded firms are required to disclose information about their products and profitability that could aid their competitors. Given that such disclosures to public market participants can be observed by a firm's current and potential rivals, these disclosures can aid rivals in competing with the disclosing firm (Ellis, Fee, and Thomas 2012). Thus, we conjecture that the competitiveness of the industry should affect the differential future profitability of public firms relative to private firms. This leads to our third research question:

RQ3: Is the differential future profitability of public versus private ownership associated with the short-termism and competitiveness faced by the industry?

We also examine whether there is a tendency for managers of public firms to report a smooth earnings stream over time. Graham et al. (2005) report, "predictability of earnings is an over-arching concern among CFOs" and the "executives believe that less predictable earnings…command a risk premium in the market." Additionally, when executives were asked directly about how much they would sacrifice to avoid volatile earnings "an astonishing 78 percent admit that they would sacrifice a small, moderate, or large amount of value to achieve a smoother earnings path." This behavior raises concerns that public firms have incentives to

report smooth earnings and sacrifice long-term value in an attempt to report smooth earnings. There is a long stream of literature in accounting and finance suggesting that public firms' attempt to smooth earnings has a detrimental impact on long-run profitability. This increasingly large literature on the pressures of managers of public corporations to report smooth and predictable earnings (Bartov 1993; DeAngelo, DeAngelo, and Skinner 1996; Barth, Elliott, and Finn 1999; Beatty et al. 2002; Graham et al. 2005; and Petrovits 2006) suggests that earnings smoothing in public firms is commonplace. However, prior research has not examined whether public firms report smoother earnings relative to private firms. This leads to our final research question:

RQ4: Do public firms have lower future variability of earnings relative to private firms?

III. RESEARCH DESIGN

To examine our first three research questions regarding profitability differences between public and private firms, we estimate the regression model shown in equation (1).[3]

$$DV_{t+i} = a_0 + a_1 PRIVATE + a_2 RNOA_t + a_3 NOA_t + a_4 SALES\_GR_t + a_5 LOSS_t + a_6 ATO_t + a_7 PM_t + \varepsilon_t \quad (1)$$

The dependent variable (*DV*) is the future profitability metric of interest. We evaluate the following future profitability metrics: (1) future return on net operating assets, measured as $RNOA_{t+1}$, $RNOA_{t+3}$, and $RNOA_{t+5}$; (2) future profit margin, measured as PM_{t+1}, PM_{t+3}, and PM_{t+5}; and (3) future asset turnover, measured as ATO_{t+1}, ATO_{t+3}, and ATO_{t+5}. *RNOA* is calculated as net operating income (before any financing costs or investment income) divided by

[3] We examine all of our hypotheses using the entire cross-section of data available to us for analysis and a propensity score matched design which is described later in this section.

average net operating assets (operating assets net of operating liabilities).[4] This is consistent with prior research (e.g., Fairfield, Ramnath, and Yohn 2009). *PM* is the firm profit margin and equals operating income divided by sales. *ATO* is asset turnover, defined as sales divided by net operating assets. The variable *PRIVATE* is an indicator variable which is equal to one when the firm is a private firm, and zero otherwise. The coefficient of interest is a_1.

We control for current profitability, size (net operating assets), sales growth, and components of profitability. We control for current profitability (*RNOA*) to purge the effects of profitability in year t on future profitability. We control for firm size (*NOA*) because we expect larger firms to be more profitable due to their access to capital and the benefits associated with economies of scale (Silberston 1972). Conversely, Monsen and Downs (1965) suggest that the bureaucratic structure of large firms results in suboptimal performance. If so, size will have a negative effect on profitability. We control for growth (*SALES_GR*) and whether the firm is currently experiencing a profit or loss (*LOSS*) so as to remove profitability differences due to differences in firm lifecycle stages. Finally, we control for the components of current profitability because prior research (e.g., Fairfield, Ramnath, and Yohn 2009) document that PM and ATO measure different constructs about a firm's operations and that PM is often more transitory.

To provide insight into our third research question regarding the effect of industry dynamics on profitability, we include an indicator variable to capture firms in industries of interest. We examine the regression model shown in equation (2) below.

$$RNOA_{t+i} = b_0 + b_1 PRIVATE + b_2 X_t + b_3 PRIVATE * X_t + b_4 RNOA_t + b_5 NOA_t + b_6 SALES\_GR_t + b_7 LOSS_t + b_8 ATO_t + b_9 PM_t + \varepsilon_t \quad (2)$$

[4] Operating income equals sales minus costs of goods sold, overhead costs, and depreciation and amortization. Net operating assets equals stockholders' equity minus cash and short term investments plus interest plus debt in current liabilities plus long-term debt.

X is an indicator variable that captures firms in short-term oriented industries (*STF*) or firms in highly competitive industries (*HERF).* The *STF* classification is based on the designation of an industry being short-term focused by Brochet et al. (2014) and captures public firms in the electronic equipment, computer, business services, supplies, banking, energy, trading, insurance, and wholesale industries. *HERF* captures firms in relatively competitive industries. We measure industry competition using the Herfindahl index, measured as the square of public firm sales scaled by aggregate industry sales summed over all public firms in the industry for the year. Lower values of the Herfindahl index indicate more competitive industries. Therefore, *HERF* is defined as one when a firm's industry Herfindahl index is less than the median Herfindahl index across all industries for the year, and zero otherwise. We also include an interaction term between *X* and *PRIVATE* (i.e., *PRIVATE*X*). This interaction term captures private firms in industries that are classified as short-term focused or highly competitive. The coefficients of interest are b_2 and b_3.

To provide insight into our final research question, we estimate the regression model shown in equation (3).

$$CV\_NI_{t+i} = d_0 + d_1 PRIVATE + d_2 RNOA_t + d_3 ASSETS_t + d_4 LOSS_t + \varepsilon_t \quad (3)$$

The dependent variable (*CV_NI*) is the coefficient of variation for net income. The coefficient of variation is the standard deviation of net income divided by the mean absolute value of net income over three and five year periods ahead. The coefficient of variation is useful because it allows the standard deviation of the data to be considered in the context of the mean of the data.[5] The use of the coefficient of variation as a measure of earnings smoothing is also

[5] The advantage of using the coefficient of variation is that it is unitless, which allows it to be compared across samples whereas the standard deviations cannot easily be compared across different samples. However, the

consistent with prior research (e.g., Michelson, Jordan-Wagner, and Wootton 1995). Again, the coefficient of interest is d_1. All variables are defined in Appendix A.

IV. DATA SOURCES, SAMPLE SELECTION, AND DESCRIPTIVE STATISTICS

Data Sources and Sample Selection

Our data set combines data on private firms obtained from Sageworks Inc., a firm that collects private firm data and develops financial analysis tools, with public firms obtained from Compustat. The Sageworks database was designed to assist accounting firms and banks performing analytical procedures and ratio analyses on private clients with benchmarking. In order to conduct such analyses, Sageworks users input their clients' financial statement information into the Sageworks system which then becomes part of the collective database used in our study. As a result, Sageworks obtains financial statement information directly from the private firms' auditors or banks and not from the private firms themselves.

Sageworks is similar to Compustat in that it contains accounting data from the income statement and balance sheet. In addition to financial information, the private firm's four digit NAICS industry code, legal form (e.g., S-Corp, C-Corp, partnership, or limited liability), fiscal year end, state, and type of audit report (e.g., compilation, review, tax return, or audit) are also available. The auditors that utilize the Sageworks software include most national mid-market accounting firms as well as hundreds of regional audit firms. Unlike Compustat, Sageworks exclusively covers private firms and all data are held anonymously so that no individual firm can be identified. Firms leave the Sageworks database due to mortality or switching to an auditing

disadvantage of the coefficient of variation is that it can be difficult to interpret if the denominator of the variable contains both positive and negative values and the mean is close to zero. As a robustness test, we restrict the coefficient of variation analysis to only companies for which the denominator (annual net income) is positive throughout the entire measurement period. The untabulated results are consistent with those presented in the paper.

firm that does not utilize the Sageworks software. Sageworks has a dedicated staff of accounting and programming specialists who review, examine, and monitor the data on a continuous basis.

To construct our initial sample of private firms, we follow a similar process as Minnis (2011) and exclude all non-U.S. based firms as well as observations with data quality issues. Specifically, we delete all firm-years that fail to satisfy basic accounting identities as well as firm-years for which net income (*NI*), cash flow from operations (*CFO*), accruals (*ACC*), or property, plant and equipment (*PPE*) are greater than total assets at yearend. We also require firms to have assets and sales greater than $100,000 and to be of legal C-Corp form to ensure comparability to public firms.

To be included in the sample of public firms, a firm must have non-missing amounts of assets, sales, and net income, be incorporated in the U.S., and have equity that is publicly traded. Finally, to be consistent with prior literature, we also exclude from both the public and private samples financial firms (NAICS 52) and regulated utilities (NAICS 22). Both the public-firm and private-firm samples cover the period from 2001 (the beginning of the Sageworks database) through 2010, yielding a ten-year panel of data. The combination of these two datasets as described constitutes our initial sample using the entire cross-section of data available to us for analysis.

Our research questions involve comparing the performance of public and private firms over a variety of time horizons, with the majority of the emphasis placed on year t+3 and year t+5. Since our main analyses focus on return on net operating assets, which requires data in year t-1 to calculate, we first require all firms to have at least five years of consecutive data (year t-1, year t, and three years of consecutive data starting after year t) to allow us to examine year t+3 results. As a result of this restriction, along with the data restrictions mentioned above, our full

sample (see Table 1 Panel A) contains 7,927 private firm-years (4,366 firms) and 26,900 public firm-years (5,048 firms) with at least five consecutive years of available data.[6]

[Please Insert Table 1 Here]

Table 1, Panel B, lists the number of firms in each of 48 Fama-French industries for our full sample of public and private firms, as well as the percentage of the sample in each industry. The largest percentage of private firms are in the "Construction" industry followed by "Wholesale" industry. The only three industries with a significant difference in the percentage of private and public firms in the industry, are "Construction", "Electronic Equipment", and "Wholesale". Overall, relative to a sample of public firms, the distribution of public and private firms across industries is quite similar. For example, 1.5% of private firms are in the "Recreation" industry, while 1.2% of public firms are in the "Recreation" industry. The difference in percentage of 0.3% is statistically insignificant.

Matching Procedure

Some characteristics that affect a firm's private versus public ownership choice also affect future performance, so we attempt to mitigate selection bias due to observables by developing a propensity score to obtain a matched sample. We attempt to mitigate endogeneity from self- selection bias due to observables, such as return on net operating assets, sales growth, profit margin, asset turnover, whether the firm reported a loss, and the size of the firm, through propensity score matching. Specifically, we estimate the following logistic propensity score model using observed characteristics from our full sample of observations from 2001-2010:

[6] The requirement of five years of private firm data restricts the Sageworks sample relative to other papers using this data (e.g., Hope et al. 2013 and Asker et al. 2014). However, this is by design because the presence of this time-series data is essential to examine our research questions. Additionally, since our main analyses require at least five years of consecutive data to examine our research questions we define "firm-year" as one observation at time t with lagged and future data available for analysis. Thus, because of the unique design employed in this study, the number of firm-year observations reported throughout the paper differs from traditional definition of firm-year observations in other contexts.

$$PRIVATE_{it} = \delta_0 + \delta_1 RNOA_{it} + \delta 2SALES\_GR_{it} + \delta_3 PM_{it} + \delta_4 ATO_{it} + \delta_5 LOSS_{it} + \delta_6 LOGAT_{it} + \Sigma_t \beta_t YEAR_t + \Sigma_k \gamma_k INDUS_i + \varepsilon_{i,t} \quad (4)$$

Equation (4) is based on models of public and private ownership choice as in Ball and Shivakumar (2005), Givoly et al. (2010), Badertscher et al. (2014), and Opler and Titman (1993). *PRIVATE* equals one if the firm is a private firm, and zero otherwise. Return on net operating assets (*RNOA*), sales growth (*SALES_GR*), profit market (*PM*), and asset turnover (*ATO*) are proxies for performance and growth. Controlling for growth at this stage is particularly important because we may observe profitability differences that are due to differences in firm lifecycle stages as opposed to underlying differences in private and public firm profitability.

The indicator variable for loss firms (*LOSS*) is a measure of profitability. Natural logarithm of total assets (*LOGAT*) is used as a proxy for firm size. In order to rule out industry and fiscal year as a driver of our results, after estimating equation (4), we perform within-fiscal year and industry (four-digit NAICS code) match-control group by matching the "nearest neighbor" private firm to a public firm and we apply a caliper restriction of 3% (see Angrist and Pischke 2009). As a result of this matching process, both samples include 603 firm-year observations. [7,8]

Results from the propensity score model are presented in Appendix B. We obtain a 72 percent McKelvey-Zavonia pseudo-R-squared in the first-stage logistic regression, which validates the relevance of our chosen control variables, and the propensity score model appears effective in forming a more balanced sample of public firms and private firms for most variables in equation (1).

[7] Our results are quantitatively similar if we allow a one-to-many match between private and public firms.
[8] The 603 firm-years consist of 475 (325) unique private (public) firms. For instance, a firm that has seven years of consecutive data starting in 2002 would appear in our sample as having $RNOA_{t+3}$ for years 2003, 2004, and 2005 while having $RNOA_{t+5}$ for year 2003.

V. EMPIRICAL RESULTS

Descriptive Statistics

The descriptive statistics are reported in Table 2. Panel A presents descriptive statistics on our entire sample and Panel B on the propensity score matched sample. Statistics reported in Panel B of Table 2 suggest that our matching procedure is effective in identifying similar public and private firms. Specifically, we observe no statistical differences in the mean and median *RNOA, PM, ATO, LTDEBT,* or *LOSS* between public and private firms for our PSM sample. We also observe a significant decrease in the difference between the full sample (Panel A) and the matched sample for *SALES, ASSETS*, and *NOA*. For the PSM sample, we continue to observe that the private firms report lower sales and sales growth than public firms.

[Please Insert Table 2 Here]

In Table 2, Panel B we also observe that future profitability, measured as $RNOA_{t+1}$, $RNOA_{t+3}$, and $RNOA_{t+5}$ are all significantly greater for private firms than for the propensity score matched public firms in our sample. This leads to preliminary univariate support for our first research question. Additionally, it appears that the magnitude of the difference between samples is monotonically increasing in both means and medians as time passes from the current year to five years out. While the levels of profitability shown in Table 2 appear relatively high we emphasize that we are examining RNOA, not ROA (i.e., return on assets). The reported levels in Table 2 are consistent with the levels of RNOA documented in prior studies. For example, Fairfield et al. (2009) document an average RNOA of nearly 15 percent for publicly traded firms in their sample, nearly double the observed ROE for the same sample.

Figure 1 plots the median levels of *RNOA*, *PM* and *ATO* in panel A, B, and C, respectively, over time for our matched companies. The figure shows that while both sets of companies begin with the same profitability in year t, they exhibit significant differences in

terms of levels of *RNOA* and *PM* in the following five years. The figure also suggests that private companies exhibit steady *RNOA* and *PM* in the next five years while the matched public companies exhibit decreasing profitability. The results reported in panel C for *ATO* over time demonstrates that the difference in profitability observed in panel A for *RNOA* appears to be primarily driven by *PM* and not *ATO*. That is, while private companies experience declining profit margins over the five year period relative to public companies, both public and private companies experience stable asset turnover over the five year period.

[Please Insert Figure 1 Here]

Regression Analyses

Tables 2 and 3 report the main results regarding the differences in future profitability between our samples of public and private firms. Panel A reports the results of equation (1) to examine our first research question. The first three columns present the results for the entire cross-sectional sample of public and private firms while the last three columns present the results for the PSM sample. The results suggest that private firms experience greater future profitability than public firms in terms of future *RNOA*. Specifically, we find that the coefficient on *PRIVATE* is positive and statistically significant for explaining *RNOA* three and five years ahead for both samples.[9] Note that *PRIVATE* remains significant in year t+5 for the PSM sample, even though the sample size decreases across the horizons from 1,206 firm-years for $RNOA_{t+3}$ to only 555 firm-years for $RNOA_{t+5}$.

In Panel B of Table 3, we run equation (1) on our sample of firms, but we limit the analysis to only private firms with audited financial statements in accordance with generally

[9] We test for statistical significance of the parameter estimates by using heteroskedasticity robust standard errors in our regressions with errors clustered by private firm and year. Since public firms can also be used multiple times in the PSM analysis, we also ran the regressions clustering by public firm and year and observe statistically similar results.

accepted accounting principles (GAAP) and public firms who naturally have audited financial statements in accordance with GAAP due to regulatory requirements.[10] We find similar results to those reported in Panel A, but notice a difference in the significance and magnitude of the positive and significant coefficients on *PRIVATE*. Therefore, the results suggest that public firms have significantly lower future profitability three and five years ahead than private firms that also incur the cost of an audit. This suggests that observed differences in future profitability between public and private firms are not solely due to the costs associated with having financial statements audited.

[Please Insert Table 3 Here]

Given the finding above that private firms tend to be more profitable on average than matched public firms, we expect to observe differences in future profit margins or future asset turnover since operating profitability is a multiplicative function of these components (Fairfield and Yohn 2001). In Table 4, we examine whether the lower future profitability experienced by public firms is manifested through lower asset turnover, profit margins, or both.

Panel A and panel B in Table 4 present the results of an examination of future profit margin (*PM*) and asset turnover (*ATO*), respectively. The results for profit margin mirror the earlier results for *RNOA*. Specifically, public firms have lower profit margins three and five years in the future relative to private firms when matched in the current year on industry, size, and profitability. This is consistent with increased disclosure requirements for public firms exposing information to competitors and leading to lower margins relative to private firms. It is also consistent with regulatory requirements leading to lower future profit margins for public firms relative to private firms.

[10] Based on our conversations with Sageworks our sample firms are audited according to U.S. GAAP; however, this is not a specific data field that is available to us.

Panel B reports the results of the regression on equation (1) with future asset turnover as the profitability metric of interest. The first three columns present the results for the entire cross-sectional sample while the second set of columns presents the results for the matched sample of public and private firms. The results suggest that private firms do not have significantly higher asset turnover relative to public firms when we examine the both the full and the PSM sample.

[Please Insert Table 4 Here]

We next examine the role of industry dynamics on the differential future profitability of public versus private firms. Table 5 reports the results of equation (2) with the industry dynamic indicator variables included in the regression. Thus, we include *STF or HERF* and the interaction between these variables and *PRIVATE* in the regressions. The coefficient on *PRIVATE* captures the differential future profitability of private firms versus public firms. *X* captures the industry characteristic *STF and HERF*, respectively. The coefficient on *PRIVATE*X* captures the effect of the industry characteristic on the differential future profitability of private firms relative to public firms.

The first column in each set of analyses of Table 5 Panel A report the results for industry short-termism on the unmatched sample of firms. The coefficient on *PRIVATE* is positive and significant in each of the future periods, consistent with the findings in Table 3. The coefficient on *PRIVATE*STF* is significantly positive in year t+3 and year t+5, suggesting that private firms experience significantly greater incremental future profitability when they are in short-term oriented industries. Panel B of Table 5 reports the same results, except the coefficient on *PRIVATE*STF* is only marginally statistically significant in year t+5. The combined results suggest that short-termism associated with an industry has a greater negative effect on the future profitability of public firms than private firms.

The second column in each set of analyses in Panel A of Table 5 reports the results for industry competition. The coefficient on *PRIVATE* is positive and significant in each of the future periods for Panel A and in year t+3 and t+5 in panel B, consistent with the findings in Table 3. In addition, the coefficient on *PRIVATE*HERF* is positive and significant in year t+3 and year t+5 in both Panel A and B. This suggests that private firms are incrementally more profitable in the future than public firms when they are from highly competitive industries.

Overall, these findings are consistent with private firms experiencing higher future profitability than public firms and with the differential profitability being more pronounced for firms in industries characterized as short-term focused or competitive.

[Please Insert Table 5 Here]

We next examine whether public firms report less variable earnings three and five years ahead relative to private firms. To perform this analysis we estimate the regression model shown in equation (3) where the dependent variable is the coefficient of variation for net income, *CV_NI*. The results are reported in Table 6. The first two columns present the results for the entire cross-sectional sample of public and private firms for CV_NI_{t+3} and CV_NI_{t+5} while the second two columns present the results for the PSM sample. The coefficient on *PRIVATE* is positive and significant for year t+3 and t+5, though the coefficient on *PRIVATE* is only marginally statistically significant in both year t+3 and t+5 for the PSM sample results. This suggests that private firms are associated with marginally larger variation in net income than public firms and is consistent with public firms reporting smoother income than private firms.

[Please Insert Table 6 Here]

Heckman Two-Stage Model

In our main analyses, we match the private firms to public firms based on a propensity matched sample of public firms using covariates with observable differences. However, we note that there is a potential self-selection bias in terms of firms' decisions to remain a private firm or to become public. Failing to take into account relevant factors in the choice to become a public firm or to stay private may lead to inappropriate inferences about differences in future profitability, especially if unobserved variables that affect the choice are also related to firms' future profitability. To address this concern, we apply the Heckman (1979) two-stage approach for a potential self- selection bias. The first stage is to estimate the decision model for the decision to remain a private firm. We use the model presented in equation (4) but we also include two exclusion restriction variables used in prior research (see Badertscher et al. 2014), the quick ratio (*Q_RATIO*) and the operating cycle (*OPER_CYCLE*). *Q_RATIO* is defined as the sum of cash, short-term investments, and total receivables scaled by current liabilities. *OPER_CYCLE* is defined as in Dechow (1994), or average accounts receivable divided by (sales/360), plus average inventory divided by (cost of goods sold/360).

The untabulated results of the first stage regression indicated that *Q_RATIO* and *OPER_CYCLE* are significantly negatively associated with *PRIVATE*. This suggests that more liquid firms and firms with longer operating cycles are less likely to remain private. The first stage regression model explains 73.3 (64.1) percent of the variation in the decision to remain private using the MacKelvey Zavonia (McFadden) pseudo R-squared.

The second stage adds a bias correction variable in the form of the Inverse Mills ratio to the main regression. Overall, the untabulated results indicated that the signs, magnitudes, and significance levels of our variables of interest (b_1, b_2 and b_3) are consistent with those reported in

Table 3. The Inverse Mills ratio is not significant in any of the models. The coefficient on *PRIVATE* is positive and significant for year t+3 and t+5, suggesting that private firms experience greater future profitability than public firms.[11]

Additional Robustness Tests

In our matching procedure, we allow a public firm to repeatedly serve as a match for a private firm. That is, we perform the match with replacement. We do this in order to find the best public firm match for each of our private firms. As an untabulated robustness test, we also performed the matching procedure without replacement. While this reduces our sample size to 914 firm-year observations (457 private and 457 public firm-years), our results are qualitatively similar. Specifically, in our analysis of *RNOA*, we find a significant positive coefficient on *PRIVATE* of 0.101 (t-stat: 3.03) for year t+3 and 0.182 (t-stat: 3.47) for year t+5.

Second, we re-estimated the main regression model after including the change in *RNOA* and the change in *NOA* in the regressions. We excluded these variables from the initial analysis because they require one more year of data which limits the sample size substantially. However, when we include these variables in the regression we find that the coefficients on these two variables are not significant and the adjusted R^2 decreases with their inclusion. We also find, however, that the results regarding the differential future profitability of public versus private firms are unchanged when these variables are included in the regressions.

Third, we examine the relation between private ownership and future *RNOA* (*PM*) after including contemporaneous sales growth in the regression to examine whether perhaps the negative relation between future profitability and public ownership is driven by differences in

[11] In untabulated analyses using the Heckman two-stage model for audited private companies, we find a significant positive coefficient on *PRIVATE* for year t+3 and year t+5.

future sales growth. We find (untabulated) a positive, and even more significant coefficient, on *PRIVATE* when future sales growth is included in the model.

Finally, we examine the main regression model with return on equity (*ROE*) as the dependent variable. All else equal, a more levered firm will have a higher *ROE* than a less levered firm and that will result in a larger gap between *RNOA* and *ROE*, but that difference also depends on the ability of the firm to earn a *RNOA* that is greater than the cost of the debt incurred. Public firms likely have greater access to and lower costs of debt due to the disclosure, audit, and regulatory requirements of the SEC. Consistent with this notion, untabulated univariate results confirm that the public firms in our sample have a lower cost of debt relative to the private firms. However, since public firms have access to public equity, they are unlikely to finance their operations through significant increases in debt. We find that private firms have higher future ROE relative to public firms. These results suggest that the less costly access to financing does not offset the lower operating profitability for public versus private firms.

VI. CONCLUSION

In this study, we exploit a large cross sectional sample of public and private firms as well as propensity score matched sample of public and private firms based on industry, size, and current profitability to examine whether public and private firms experience differential future profitability. We find robust evidence that private firms are more profitable in the future than public firms. We also examine the underlying drivers of the lower future profitability of public versus private firms. Specifically, we examine whether the lower future profitability of public firms is associated with lower future profit margins and/or asset turnover relative to private firms. We find that the relatively lower profitability for private versus public firms is driven by

lower profit margins in the long run. We find evidence consistent with the lower future profitability of public firms relative to private firms being more pronounced in industries that are characterized as short-term focused and highly competitive. Finally, we find that public firms report lower future variability of earnings relative to private firms.

There are several limitations to our study. First, due to sample size and time-series data limitations, our ability to test future profitability is potentially limited. However, existing studies (e.g., Sloan 1996; Fairfield, Whisenant, and Yohn 2003) use windows as short as one year ahead when examining future profitability and therefore our horizon is not inconsistent with, and some cases longer than, that used in prior research. Additionally, our results are generalizable only to the extent that the private firms in our sample and their corresponding public matches are representative of private and public firms in general. The Sageworks database is populated by firms that are in contact with auditors and bankers that take the extra time to benchmark their clients' ratios and financial data against what they must believe to be a useful and archetypical sample of firms. Therefore, this process potentially leads to particular types of firms being included in the Sageworks sample. Finally, the variables available to us to examine ownership structure, instead of public versus private ownership in general, are restricted and limit our ability to identify the specific mechanisms and corporate governance characteristics that result in the observed differences. Despite these limitations, our results provide important insights for academics, managers, lenders, and equity providers (both public and private) on the overall effect of public versus private ownership on future profitability.

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APPENDIX A

Variables of Interest

RNOA	Return on net operating income equals operating income divided by average net operating assets. Operating income equals sales (Compustat SALE, Sageworks SALES) minus cost of goods sold (COGS plus XSGA, COSTOFSALES plus OVERHEAD) minus depreciation and amortization (DP, DEPRECIATION plus AMORTIZATION). Net operating assets equals stockholders' equity (SEQ, TOTALEQUITY) minus cash and short term investments (CHE, CASH) plus interest (XINT, INTEREST) plus debt in current liabilities (DLC, SHORTTERMDEBT plus CURRENTLONGTERMDEBT) plus long-term debt (DLTT, SENIORDEBT plus SUBORDINATEDDEBT).
PM	Profit margin equals operating income divided by sales.
ATO	Asset turnover equals sales divided by average net operating assets.
CV_NI	The coefficient of variation for net income is the standard deviation of net income divided by the mean absolute value of net income over three and five year periods ahead.
PRIVATE	An indicator variable which is equal to one when the firm is a private firm, and zero otherwise.
STF	An indicator variable that captures firms in short-term oriented industries. STF classification is based on the designation of an industry being short-term focused by Brochet et al. (2014) and captures public firms in the electronic equipment, computer, business services, supplies, banking, energy, trading, insurance, and wholesale industries.
HERF	An indicator variable based on the Herfindahl index, measured as the square of public firm sales scaled by aggregate industry sales summed over all public firms in the industry for the year. Lower values of the Herfindahl index indicate more competitive industries. Therefore, HERF is defined as one when a firm's industry Herfindahl index is less than the median Herfindahl index across all industries for the year, and zero otherwise.
SALES	Equals total sales (SALE, SALES).
SALES_GR	Equals sales in the year t + x less sales in t + x -1 divided by sales in t + x -1.
ASSETS	Equals total assets (AT, TOTALASSETS).
LOGAT	Natural logarithm of *ASSETS*.
NI	NI equals net income (NI, NETINCOME).
LTDEBT	Total long-term debt (DLTT, SENIORDEBT plus SUBORDINATEDDEBT) divided by average total assets.
LOSS	Equal to one if net income is less than zero and zero otherwise.

APPENDIX B

Propensity Score Matching Logistic Regression

$$PRIVATE_{it} = \delta_0 + \delta_1 RNOA_{it} + \delta_2 SALES\_GR_{it} + \delta_3 PM_{it} + \delta_4 ATO_{it} + \delta_5 LOSS_{it} + \delta_6 LOGAT_{it} + \Sigma_t \beta_t YEAR_t + \Sigma_k \gamma_k INDUS_i + \varepsilon_{i,t}$$

	Intercept	RNOA	SALES_GR	PM	ATO	LOSS	LOGAT
Coefficient	-31.69	1.28	-0.85	1.06	0.00	-0.61	-1.67
Odds Ratio	na	0.28	2.33	0.35	1.00	1.84	5.35
z-statistic	-0.02	10.50	-6.35	4.24	-0.95	-6.93	-58.19

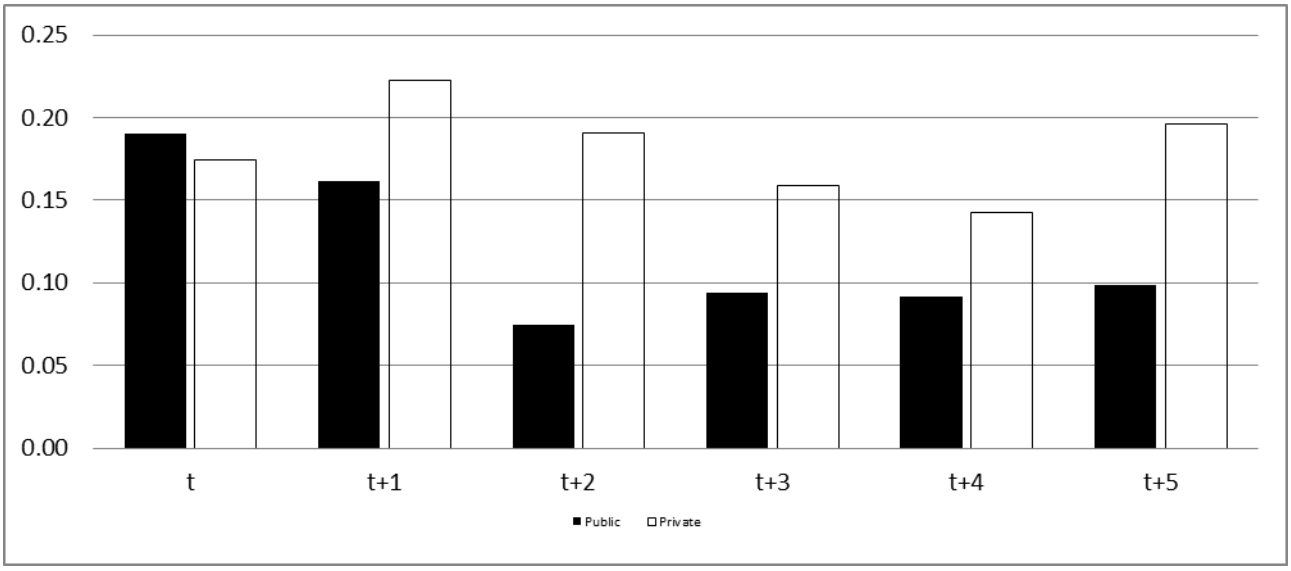
Year Fixed Effects	Yes
Industry Fixed Effects	Yes
McKelvey-Zavonia R^2	72.1%
McFadden R^2	62.3%
n	34,827

All variables are as defined in Appendix A.

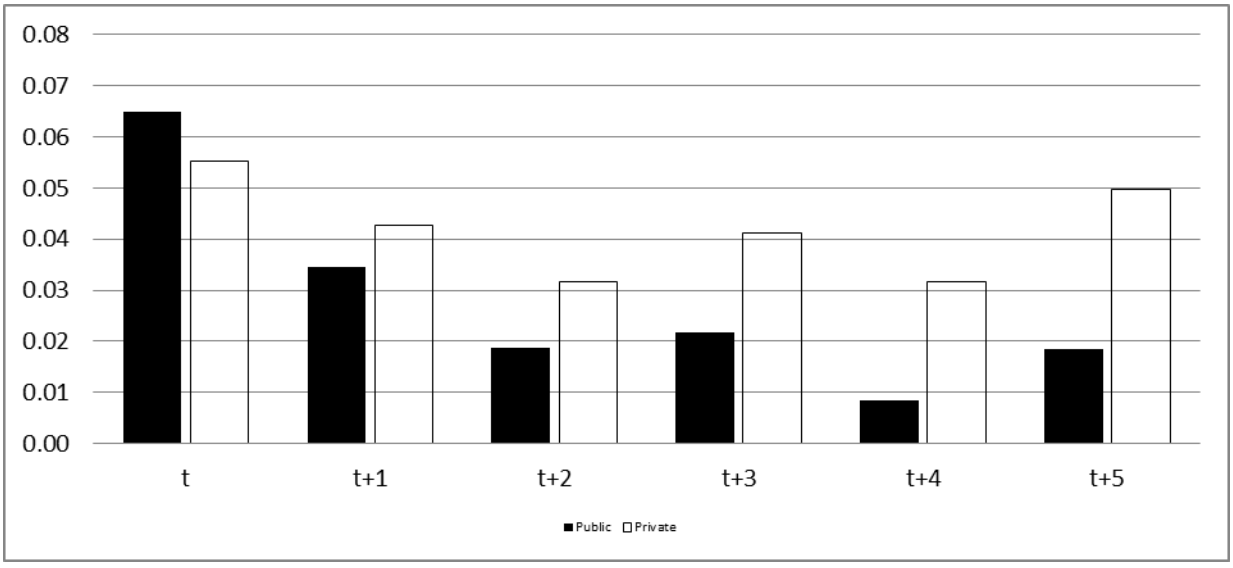
FIGURE 1

Median Return on Net Operating Assets, Profit Margin and Asset Turnover for Public and Private Firms based on Propensity Score Matching

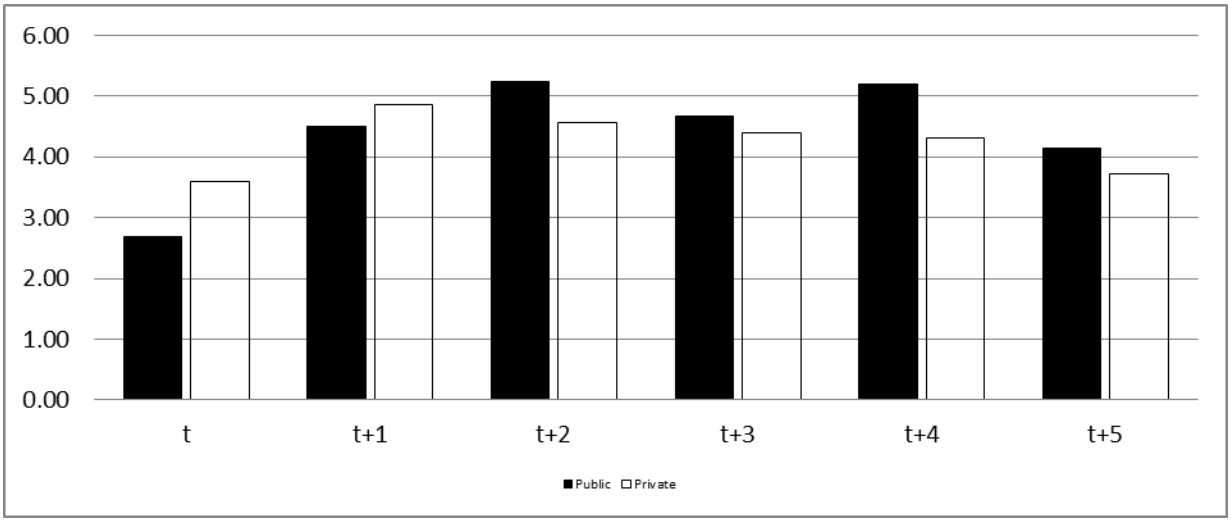
Panel A: Return on Net Operating Assets (*RNOA*)



Panel B: Profit Margin (*PM*)



Panel C: Asset Turnover (*ATO*)



Public and private firms are matched based on Propensity Score Matching. See Appendix B for Propensity Score Matching model. All variables are as defined in Appendix A.

Table 1
Sample Selection and Distribution

Panel A: Private firm sample selection process

Sample Selection (2001 - 2010)	Private	Public
Initial Sample of U.S. Firms	439,517	110,710
Eliminate observations that fail to satisfy basic accounting identities	(6,513)	0
Eliminate firms in Utilities, Finance, and Insurance industries	(8,283)	(3,528)
Eliminate firms with missing financial data to compute necessary variables	(323,236)	(80,282)
Eliminate observations that are not based on Audited, Compiled, or Reviewed financial statements	(64,071)	0
Eliminate observations with annual sales and assets less than $100,000	(29,487)	0
Firm-year observations	7,927	26,900
Firms	4,366	5,048

Panel B: Sample distribution by Fama-French industry of private and public firms

Fama French Industry Code	Fama French Industry Name	Private		Public		Difference in %
1	Agriculture	82	1.0%	174	0.6%	0.4%
2	Food Products	112	1.4%	551	2.0%	-0.6%
3	Candy & Soda	9	0.1%	235	0.9%	-0.8%
4	Beer & Liquor	0	0.0%	0	0.0%	0.0%
5	Tobacco Products	0	0.0%	43	0.2%	-0.2%
6	Recreation	121	1.5%	333	1.2%	0.3%
7	Entertainment	75	0.9%	510	1.9%	-0.9%
8	Printing and Publishing	117	1.5%	620	2.3%	-0.8%
9	Consumer Goods	106	1.3%	1,198	4.5%	-3.1%
10	Apparel	14	0.2%	452	1.7%	-1.5%
11	Healthcare	45	0.6%	561	2.1%	-1.5%
12	Medical Equipment	25	0.3%	1,226	4.6%	-4.2%
13	Pharmaceutical Products	5	0.1%	1,007	3.7%	-3.7%
14	Chemicals	75	0.9%	655	2.4%	-1.5%
15	Rubber and Plastic Products	0	0.0%	0	0.0%	0.0%
16	Textiles	23	0.3%	105	0.4%	-0.1%
17	Construction Materials	498	6.3%	801	3.0%	3.3%
18	Construction	2,369	29.9%	1,354	5.0%	**24.9%**
19	Steel Works Etc	205	2.6%	674	2.5%	0.1%
20	Fabricated Products	73	0.9%	291	1.1%	-0.2%
21	Machinery	211	2.7%	978	3.6%	-1.0%
22	Electrical Equipment	28	0.4%	272	1.0%	-0.7%
23	Automobiles and Trucks	53	0.7%	228	0.8%	-0.2%
24	Aircraft	9	0.1%	212	0.8%	-0.7%
25	Shipbuilding, Railroad Equipment	21	0.3%	55	0.2%	0.1%
26	Defense	0	0.0%	0	0.0%	0.0%
27	Precious Metals	4	0.1%	333	1.2%	-1.2%
28	Non-Metallic and Industrial Metal Mining	44	0.6%	307	1.1%	-0.6%
29	Coal	19	0.2%	231	0.9%	-0.6%
30	Petroleum and Natural Gas	9	0.1%	712	2.6%	-2.5%
31	Utilities	0	0.0%	0	0.0%	0.0%
32	Communication	45	0.6%	1,337	5.0%	-4.4%
33	Personal Services	185	2.3%	278	1.0%	1.3%
34	Business Services	459	5.8%	1,170	4.3%	1.4%
35	Computers	9	0.1%	582	2.2%	-2.1%
36	Electronic Equipment	40	0.5%	2,124	7.9%	**-7.4%**
37	Measuring and Control Equipment	0	0.0%	0	0.0%	0.0%
38	Business Supplies	154	1.9%	355	1.3%	0.6%
39	Shipping Containers	39	0.5%	71	0.3%	0.2%
40	Transportation	136	1.7%	857	3.2%	-1.5%
41	Wholesale	1,261	15.9%	1,123	4.2%	**11.7%**
42	Retail	1,091	13.8%	2,759	10.3%	3.5%
43	Restaraunts, Hotels, Motels	67	0.8%	459	1.7%	-0.9%
44	Banking	0	0.0%	0	0.0%	0.0%
45	Insurance	0	0.0%	0	0.0%	0.0%
46	Real Estate	32	0.4%	1,171	4.4%	-3.9%
47	Trading	0	0.0%	238	0.9%	-0.9%
48	Almost Nothing	57	0.7%	258	1.0%	-0.2%
		7,927	100%	26,900	100%	

Bold indicates significantly different at the 10% level.

TABLE 2

Descriptive Statistics for Public and Private Firms

Panel A: Descriptive Statistics for Public and Private Firms for the Full Sample

	Private						Public						Difference			
Variable	**mean**	**std**	**q1**	**med**	**q3**	**n**	**mean**	**std**	**q1**	**med**	**q3**	**n**	**Mean**		**Median**	
RNOA	0.293	0.401	0.052	0.196	0.529	7,927	0.119	0.306	0.034	0.117	0.232	26,900	0.174	***	0.079	***
RNOAt+1	0.297	0.405	0.053	0.206	0.544	7,927	0.121	0.297	0.033	0.116	0.231	26,900	0.176	***	0.090	***
RNOAt+3	0.236	0.424	0.006	0.149	0.466	7,927	0.123	0.302	0.035	0.121	0.236	26,900	0.113	***	0.028	***
RNOAt+5	0.216	0.441	-0.021	0.144	0.441	2,567	0.126	0.291	0.037	0.122	0.235	17,433	0.196	***	0.022	**
ATO	8.876	10.522	3.265	5.601	9.819	7,927	2.416	2.624	0.938	1.672	2.863	26,900	6.460	***	3.929	***
PM	0.058	0.094	0.009	0.033	0.086	7,927	0.073	0.211	0.018	0.075	0.154	26,900	-0.015	***	-0.042	***
SALES	13.3	22.4	2.8	6.2	13.3	7,927	3,145.2	8,991.4	75.5	360.6	1,611.9	26,900	-3,131.8	***	-354.4	***
SALES_GR	0.106	0.242	-0.023	0.071	0.196	7,927	0.127	0.265	-0.014	0.087	0.220	26,900	-0.021	***	-0.016	***
ASSETS	12.7	285.0	1.2	2.6	6.0	7,927	4,056.2	12,124.9	90.4	448.5	2,073.3	26,900	-4,043.5	***	-445.8	***
NOA	2.9	5.7	0.4	1.0	2.7	7,927	2,282.9	6,616.4	44.2	244.0	1,241.2	26,900	-2,280.0	***	-243.0	***
LTDEBT	0.091	0.181	0.000	0.000	0.090	7,927	0.188	0.201	0.004	0.137	0.297	26,900	-0.097	***	-0.137	***
LOSS	0.212	0.409	0.000	0.000	0.000	7,927	0.279	0.448	0.000	0.000	1.000	26,900	-0.067	***	0.000	
STF	0.245	0.430	0.000	0.000	0.000	7,927	0.242	0.428	0.000	0.000	0.000	26,900	0.003		0.000	
HERF	0.295	0.456	0.000	0.000	1.000	7,927	0.682	0.466	0.000	1.000	1.000	26,900	-0.386	***	-1.000	***
CV_NIt+3	1.636	2.267	0.438	0.804	1.590	7,927	0.969	1.836	0.180	0.362	0.819	26,900	0.668	***	0.442	***
CV_NIt+5	1.964	2.460	0.567	0.996	2.093	2,567	1.461	2.221	0.341	0.626	1.336	17,433	0.503	***	0.369	***

Panel B: Descriptive Statistics for Public and Private Firms for the Propensity Matched Sample

	Private						Public						Difference			
Variable	**mean**	**std**	**q1**	**med**	**q3**	**n**	**mean**	**std**	**q1**	**med**	**q3**	**n**	**Mean**		**Median**	
RNOA	0.244	0.423	0.033	0.174	0.456	603	0.217	0.326	0.090	0.190	0.358	603	0.027		-0.016	
RNOAt+1	0.236	0.404	0.053	0.223	0.536	603	0.160	0.306	-0.032	0.162	0.311	603	0.076	**	0.061	**
RNOAt+3	0.226	0.417	0.036	0.159	0.446	603	0.106	0.378	-0.081	0.094	0.242	603	0.120	***	0.065	**
RNOAt+5	0.257	0.435	0.043	0.196	0.477	232	0.104	0.265	-0.010	0.099	0.271	323	0.153	**	0.097	*
ATO	6.997	12.877	2.413	3.597	9.152	603	6.277	4.747	1.730	2.684	4.632	603	0.720		0.913	
PM	0.057	0.122	0.006	0.055	0.091	603	0.045	0.177	0.031	0.065	0.097	603	0.012		-0.009	
SALES	57.1	199.4	5.7	12.0	27.6	603	282.3	1,406.7	8.0	14.9	29.5	603	-225.2	***	-2.9	
SALES_GR	0.138	0.269	-0.009	0.093	0.240	603	0.178	0.329	-0.013	0.134	0.366	603	-0.040	***	-0.042	***
ASSETS	102.6	1,029.3	2.9	6.2	15.4	603	418.1	2,272.5	5.2	8.8	17.5	603	-315.5	***	-2.6	**
NOA	19.7	75.5	0.9	2.4	7.0	603	270.1	1,450.4	2.1	5.2	9.9	603	-250.4	***	-2.8	**
LTDEBT	0.113	0.173	0.000	0.040	0.107	603	0.119	0.167	0.000	0.081	0.184	603	-0.006		-0.041	
LOSS	0.252	0.435	0.000	0.000	1.000	603	0.171	0.377	0.000	0.000	0.000	603	0.081	***	0.000	
CV_NIt+3	1.447	2.215	0.360	0.701	1.270	603	0.822	1.128	0.265	0.493	0.971	603	0.625	***	0.208	***
CV_NIt+5	1.704	2.334	0.515	0.826	1.709	232	1.361	2.471	0.404	0.637	1.651	323	0.343	*	0.189	*

All variables are as defined in Appendix A. $RNOA_{t+x}$ equals return on net operating assets for year t+x. All continuous variables are winsorized at 1st and 99th percentile. In Panel A, ***, **,* denote that the value in the private partition significantly differs from the corresponding value in the public partition at the 1, 5, and 10 percent levels, respectively (two-tailed). T-tests (Wilcoxon signed-rank tests) are used for assessing means (medians).

TABLE 3

Regressions of Future Return on Net Operating Assets on an Indicator Variable for Private Firms and Financial Performance Variables

Panel A: Private Firm Indicator Variable and Financial Performance Variables

	Full Sample						**Propensity Matched Sample**					
	RNOAt+1		***RNOAt+3***		***RNOAt+5***		***RNOAt+1***		***RNOAt+3***		***RNOAt+5***	
	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat
Intercept	-0.016	-3.830	0.068	13.355	0.198	6.504	-0.012	-0.438	-0.068	-1.620	0.098	2.029
PRIVATE	**0.158**	**6.552**	**0.220**	**8.162**	**0.252**	**2.836**	**0.076**	**1.203**	**0.163**	**3.647**	**0.330**	**7.343**
RNOA	0.643	68.069	0.430	42.113	0.346	23.312	0.624	12.537	0.297	4.831	0.153	1.471
NOA	0.000	2.506	0.000	7.494	0.000	8.248	0.000	0.759	0.000	1.867	0.000	1.260
SALES_GR	-0.026	-4.351	-0.077	-10.706	-0.088	-9.160	-0.065	-1.895	-0.225	-5.263	-0.088	-1.525
LOSS	0.027	8.055	0.025	5.639	0.008	1.236	0.083	3.263	0.055	1.487	-0.084	-1.729
ATO	0.005	8.561	0.003	6.018	0.002	2.083	0.005	2.804	0.004	2.811	0.003	1.107
PM	0.179	16.182	0.185	14.286	0.124	7.662	0.071	0.594	0.391	3.231	-0.067	-0.526
Adjusted R2	53.13%		25.53%		16.88%		48.03%		22.66%		21.35%	
Year Fixed Effects	Yes		Yes		Yes		Yes		Yes		Yes	
Industry Fixed Effects	Yes		Yes		Yes		Yes		Yes		Yes	
Standard Errors Clustered by Firm and Year	Yes		Yes		Yes		Yes		Yes		Yes	
n	34,827		34,827		20,000		1,206		1,206		555	

Panel B: Private Firm Indicator Variable and Financial Performance Variables for Audited Firms Only

	Full Sample						**Propensity Matched Sample**					
	RNOA_t+1		***RNOA_t+3***		***RNOA_t+5***		***RNOA_t+1***		***RNOA_t+3***		***RNOA_t+5***	
	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat
Intercept	-0.019	-4.008	0.056	8.469	0.194	6.571	0.030	0.854	-0.059	-1.207	0.072	1.460
PRIVATE	**0.137**	**0.816**	**0.259**	**2.089**	**0.171**	**2.252**	**-0.060**	**-0.755**	**0.120**	**5.193**	**0.091**	**1.678**
RNOA	0.642	57.902	0.468	29.903	0.306	18.084	0.604	9.357	0.294	3.674	0.058	0.543
NOA	0.000	4.792	0.000	7.236	0.000	8.673	0.000	0.863	0.000	1.976	0.000	0.912
SALES_GR	-0.009	-1.461	-0.071	-8.396	-0.088	-9.128	-0.058	-1.691	-0.243	-5.367	-0.059	-0.895
LOSS	0.007	1.997	0.022	3.951	-0.004	-0.674	0.037	1.114	0.037	0.807	-0.061	-1.254
ATO	0.010	8.690	0.010	7.433	0.004	2.686	0.003	1.256	0.002	1.287	0.007	1.348
PM	0.155	11.315	0.177	9.716	0.154	7.960	-0.034	-0.254	0.314	2.323	0.020	0.178
Adjusted R2	59.02%		26.59%		17.64%		44.97%		26.59%		13.89%	
Year Fixed Effects	Yes		Yes		Yes		Yes		Yes		Yes	
Industry Fixed Effects	Yes		Yes		Yes		Yes		Yes		Yes	
Standard Errors Clustered by Firm and Year	Yes		Yes		Yes		Yes		Yes		Yes	
n	28,252		28,252		17,709		808		808		469	

All variables are as defined in Appendix A. *RNOAt+x* equals return on net operating assets for year t+x. All continuous variables are winsorized at 1st and 99th percentile.

TABLE 4

Regressions of Future Profit Margin and Asset Turnover on an Indicator Variable for Private Firms and Financial Performance Variables

Panel A: Profit Margin (*PM*) Analysis

	Full Sample						Propensity Matched Sample					
	PM_t+1		***PM_t+3***		***PM_t+5***		***PM_t+1***		***PM_t+3***		***PM_t+5***	
	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat
Intercept	-0.004	-1.370	0.047	16.259	0.095	7.612	-0.011	-0.810	-0.046	-2.447	0.050	2.218
PRIVATE	**0.016**	**2.522**	**0.023**	**3.042**	**0.041**	**2.356**	**0.022**	**0.732**	**0.140**	**3.073**	**0.088**	**6.097**
RNOA	-0.010	-3.320	-0.006	-1.430	0.126	21.332	0.067	3.845	0.012	0.548	0.034	1.080
ASSETS	0.000	6.855	0.000	12.676	0.000	16.622	0.000	2.055	0.000	5.333	0.000	3.195
SALES_GR	-0.005	-1.378	-0.026	-6.103	-0.021	-3.280	-0.027	-1.903	-0.105	-5.323	-0.047	-1.409
LOSS	0.005	3.152	0.009	4.532	-0.052	-15.504	0.014	1.242	-0.004	-0.227	-0.047	-2.073
ATO	0.000	-0.423	-0.001	-4.909	0.000	-0.030	0.000	-1.427	0.000	0.463	0.027	0.724
PM	0.775	92.218	0.572	55.505	-0.010	-0.804	0.407	4.451	0.413	4.605	-0.047	-0.857
Adjusted R2	65.93%		38.30%		12.02%		36.68%		26.81%		14.90%	
Year Fixed Effects	Yes		Yes		Yes		Yes		Yes		Yes	
Industry Fixed Effects	Yes		Yes		Yes		Yes		Yes		Yes	
Standard Errors Clustered by Firm and Year	Yes		Yes		Yes		Yes		Yes		Yes	
n	34,827		34,827		20,000		1,206		1,206		555	

Panel B: Asset Turnover (*ATO*) Analysis

	Full Sample						Propensity Matched Sample					
	ATO_t+1		***ATO_t+3***		***ATO_t+5***		***ATO_t+1***		***ATO_t+3***		***ATO_t+5***	
	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat
Intercept	0.999	16.190	1.464	19.103	2.020	5.578	1.003	2.099	1.063	1.499	-1.019	-0.385
PRIVATE	**1.426**	**1.340**	**2.238**	**0.829**	**2.663**	**1.181**	**1.648**	**0.739**	**2.145**	**0.362**	**5.769**	**1.025**
RNOA	0.531	3.180	0.446	2.178	0.787	2.996	1.651	1.529	4.341	2.770	8.666	1.319
NOA	0.000	-11.922	0.000	-12.388	0.000	-9.695	0.000	-1.912	0.000	-1.518	0.000	-0.461
SALES_GR	-0.184	-1.935	-0.616	-5.368	-0.386	-3.075	-0.240	-0.326	-3.292	-3.605	-3.872	-1.228
LOSS	0.049	0.824	0.244	2.903	0.144	1.547	0.552	0.976	0.831	0.948	2.473	0.970
ATO	0.609	34.534	0.497	25.069	0.390	12.026	0.406	6.690	0.403	5.516	0.163	1.201
PM	-1.742	-9.493	-2.204	-9.841	-2.580	-9.890	-3.526	-1.828	-6.838	-2.604	-5.104	-0.592
Adjusted R2	57.46%		35.45%		27.07%		43.78%		26.24%		17.03%	
Year Fixed Effects	Yes		Yes		Yes		Yes		Yes		Yes	
Industry Fixed Effects	Yes		Yes		Yes		Yes		Yes		Yes	
Standard Errors Clustered by Firm and Year	Yes		Yes		Yes		Yes		Yes		Yes	
n	34,827		34,827		20,000		1,206		1,206		555	

PM_{t+1} equals profit margin for year t+1. PM_{t+3} equals profit margin for year t+3. PM_{t+5} equals profit margin for year t+5. *PM*, profit margin, equals operating income divided by sales. All variables are as defined in Appendix A. All continuous variables are winsorized at 1st and 99th percentile.

TABLE 5

Private Firm Analysis with Short-term Focus and Competition Indicator Variables

Panel A: Full Sample

	RNOAt+1				***RNOAt+3***				***RNOAt+5***			
	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat
	STF		HERF		STF		HERF		STF		HERF	
Intercept	-0.016	-3.907	-0.009	-2.023	0.067	13.092	0.075	14.145	0.200	6.539	0.206	6.730
PRIVATE	**0.161**	**6.617**	**0.150**	**6.208**	**0.223**	**8.259**	**0.210**	**9.105**	**0.163**	**2.932**	**0.243**	**3.743**
X	0.002	1.377	-0.012	-5.124	-0.022	-1.836	-0.013	-4.098	-0.021	-1.790	-0.012	-2.945
*PRIVATE*X*	0.019	1.298	0.040	3.491	0.060	1.971	0.027	2.589	0.075	2.417	0.066	2.580
RNOA	0.643	68.035	0.643	67.886	0.430	42.090	0.429	41.989	0.346	23.309	0.345	23.202
NOA	0.000	2.616	0.000	2.791	0.000	7.563	0.000	7.702	0.000	8.112	0.000	8.395
SALES_GR	-0.026	-4.357	-0.026	-4.299	-0.077	-10.703	-0.076	-10.662	-0.088	-9.155	-0.087	-9.090
LOSS	0.027	8.046	0.028	8.278	0.025	5.633	0.026	5.831	0.008	1.290	0.009	1.403
ATO	0.005	8.534	0.005	8.528	0.003	5.983	0.003	5.975	0.002	2.076	0.002	2.077
PM	0.179	16.178	0.181	16.269	0.185	14.276	0.187	14.370	0.124	7.656	0.126	7.739
Adjusted R2	54.09%		54.11%		25.54%		25.56%		16.91%		16.95%	
Year Fixed Effects	Yes		Yes		Yes		Yes		Yes		Yes	
Industry Fixed Effects	Yes		Yes		Yes		Yes		Yes		Yes	
Standard Errors Clustered by Firm and Year	Yes		Yes		Yes		Yes		Yes		Yes	
n	34,827				34,827				20,000			

Panel B: Propensity Matched Sample

	RNOAt+1				***RNOAt+3***				***RNOAt+5***			
	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat
	STF		HERF		STF		HERF		STF		HERF	
Intercept	-0.010	-0.356	-0.027	-0.941	-0.091	-1.960	-0.177	-3.962	0.106	2.150	0.076	1.604
PRIVATE	**0.175**	**1.191**	**0.192**	**1.305**	**0.463**	**2.293**	**0.553**	**2.748**	**0.859**	**7.471**	**1.017**	**9.472**
X	-0.003	-0.161	0.006	-1.793	-0.005	-0.670	-0.181	-5.692	-0.063	-2.003	-0.114	-3.318
*PRIVATE*X*	-0.008	-0.173	-0.015	0.231	0.070	2.064	0.191	3.963	0.038	1.854	0.061	2.500
RNOA	0.625	12.386	0.621	12.319	0.288	4.690	0.276	4.507	0.133	1.230	0.121	1.126
NOA	0.000	0.754	0.000	0.797	0.000	1.852	0.000	1.692	0.000	1.511	0.000	1.441
SALES_GR	-0.065	-1.862	-0.057	-1.565	-0.215	-5.000	-0.171	-3.751	-0.096	-1.614	-0.058	-0.964
LOSS	0.083	3.259	0.083	3.278	0.054	1.431	0.057	1.557	-0.093	-1.867	-0.061	-1.295
ATO	0.005	2.813	0.005	2.776	0.004	2.786	0.004	2.519	0.003	1.024	0.003	0.890
PM	0.070	0.585	0.069	0.577	0.403	3.369	0.376	2.980	-0.039	-0.300	-0.066	-0.530
Adjusted R2	48.03%		48.09%		22.86%		24.85%		22.28%		23.96%	
Year Fixed Effects	Yes		Yes		Yes		Yes		Yes		Yes	
Industry Fixed Effects	Yes		Yes		Yes		Yes		Yes		Yes	
Standard Errors Clustered by Firm and Year	Yes		Yes		Yes		Yes		Yes		Yes	
n	1,206				1,206				555			

$RNOA_{t+1}$ equals return on net operating assets for year t+1. $RNOA_{t+3}$ equals return on net operating assets for year t+3. $RNOA_{t+5}$ equals return on net operating assets for year t+5. All variables are as defined in Appendix A. All continuous variables are winsorized at 1st and 99th percentile.

TABLE 6

Regressions of the Coefficient of Variation for Net Income

	Full Sample				**Propensity Matched Sample**			
	CV_NIt+3		***CV_NIt+5***		***CV_NIt+3***		***CV_NIt+5***	
	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat
Intercept	1.039	24.467	1.095	7.780	0.701	4.020	1.651	5.823
PRIVATE	**0.603**	**4.594**	**1.196**	**2.255**	**1.739**	**1.767**	**0.833**	**1.729**
RNOA	-0.562	-12.158	-0.971	-12.149	-0.212	-1.147	-1.128	-2.051
NOA	0.000	-8.352	0.000	-7.911	0.000	-2.688	0.000	-1.312
SALES_GR	0.113	1.985	0.355	3.880	-0.062	-0.312	-0.811	-1.272
LOSS	2.242	37.949	1.724	23.006	1.717	6.200	-0.157	-0.351
Adjusted R2	18.19%		11.34%		21.21%		8.63%	
Year Fixed Effects	Yes		Yes		Yes		Yes	
Industry Fixed Effects	Yes		Yes		Yes		Yes	
Standard Errors Clustered by Firm and Year	Yes		Yes		Yes		Yes	
n	34,827		20,000		1,206		555	

CV_NI_{t+3} (CV_NI_{t+5}) equals the coefficient of variation of net income over years t, t+1, t+2, and t+3 (t+4, t+5), where the coefficient of variation is the standard deviation of net income divided by the average value of net income over the same period. All variables are as defined in Appendix A. All continuous variables are winsorized at 1st and 99th percentile.