DOES TAX MANAGEMENT PLAY A ROLE IN SUSTAINING A COMPETITIVE ADVANTAGE?

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Abstract

This paper examines whether tax management explains firms' sustained competitive advantage after controlling for other known drivers of such advantage. We find that the explicit tax costs of firms exhibiting a sustained competitive advantage are significantly lower than that of non-advantaged firms. Our results are robust to both an accounting-based measure of sustained competitive advantage using ROE and a market-based measure using Tobin's q, as well as different tax cost measures, all measured over five years. Our study extends the strategic management literature by showing that tax management plays an important role in sustaining a firm's competitive advantage.

Keywords: Sustainable Competitive Advantage, Tax Management, Tax Avoidance, Tax Minimization, Dynamic Capabilities

JEL Code: H25

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INTRODUCTION

One of the primary questions in the field of strategic management is how firms achieve and sustain a competitive advantage. The Resource-Based-View (RBV) suggests that firms obtain a temporary competitive advantage when they implement a unique value creating capability that cannot be readily duplicated by competitors and allow the extraction of abnormal rents from customers (Barney, 1991; Newbert, 2007). A rich literature in strategic management research has developed on understanding the attributes that allow some firms to sustain their competitive advantage for an extended period of time (Porter, 1985; Rumelt, 1991; Roberts, 1999). Teece (2007), for example, suggests that sustainable competitive advantage requires more than just ownership of difficult to replicate dynamic capabilities. It may also require additional capabilities that can be harnessed to continuously create, extend, upgrade, and protect the firm's unique strategic resource.[1] Porter (1996) argues that efficiency enhancing techniques may take on strategic implications themselves if they increase the cost of imitating the strategic capability by competitors. Further, firms may not necessarily have just one but rather a multiplicity of efficiency enhancing capabilities in order to make it more difficult for rivals to duplicate their unique capability and allow them to sustain their competitive advantage as long as possible (D'Aveni, Dagnino, and Smith 2010).

[1] Specifically, firms can make it more difficult and costly for competitors to reduce their competitive advantage by developing dynamic cost efficiency capabilities designed to extend, upgrade and protect their unique capability (Rumelt, 1984, 1987; Dierickx and Cool, 1989; Barney, 1991).

The purpose of this paper is to examine whether tax management is associated with firms which exhibit a sustained competitive advantage. We define tax management as the cumulative effect of a firm's tax planning activities designed to minimize the amount of explicit taxes paid to federal, state and foreign taxing authorities. We suggest that competitively advantaged firms are more likely to be associated with effective tax management programs because they can utilize the additional after-tax cash flows generated by their unique capability to acquire tax expertise and develop tax planning strategies designed to reduce their explicit tax costs.[2] We argue that tax management, like other operational efficiency activities, enable competitively advantaged firms to further minimize costs and free up additional resources that allow it to protect their unique asset base and make it more difficult (and cost ineffective) for competitors to imitate or substitute their unique capability. We suggest that they will do so when the benefit of managing explicit tax costs exceeds the associated non-tax costs of doing so.

Our focus on tax management is motivated by two reasons. First, although businesses' efforts around tax management is certainly not new, stories about some of the largest corporations' use of aggressive tax planning as an important and integral part of their overall competitive strategy have grabbed national headlines recently. For example, a New York Times article reported that General Electric, one of the largest U.S. corporations, had an effective tax rate of 7.4 percent compared to the U.S. corporate statutory rate of 35 percent (Kocieniewski, 2011). GE is widely known to not only employ one of the largest in-house tax departments that includes former Treasury officials to help implement complex tax strategies, but also to commit large resources to lobbying and winning tax breaks. Of course, GE is not alone in employing these strategies.

[2] These strategies can include but are not necessarily limited to: 1) the impact of taxes on structuring asset acquisition or financing alternatives, 2) the organizational form choice for existing or new ventures, 3) developing a comprehensive multi-state or multi-national tax program.

Indeed, a 2011 study by the Citizens for Tax Justice of the 280- largest U.S. firms found that on average they paid at only about half the top U.S. statutory tax rate of 35 percent, including a number that paid nothing at all (McIntyre *et al*., 2011). With companies increasingly viewing their tax departments as "profit centers," corporate tax receipts over the last few decades have fallen to a quarter of their 1950's levels. Second, while prior research has examined the effect various factors have in explaining sustained competitive advantage, to our knowledge no study has explored the role of tax management in firms' ability to sustain this advantage over their competitors.

To examine this issue we correlate a firm's income tax burden with measures of sustained competitive advantage over rolling five consecutive years over a two decade period from 1987 to 2009. We use four different measures of tax burdens or costs based on cash taxes paid, tax expense for financial reporting purposes (book effective tax rate and current effective tax rate) and the marginal tax rate to measure tax management. Our definition of sustainable competitive advantage is based on both an accounting measure (five-year average return on equity) and a market measure (five-year average Tobin's *q*), with firms in the top 10 percent of either measure classified as exhibiting sustained competitive advantage.[3,4] Our results show that long-term tax management significantly explains firms' ability to sustain a competitive advantage, after controlling for firm-specific factors which prior research has shown to influence either firm performance or income tax burdens. Specifically, we find that firms with lower explicit tax costs exhibit higher sustained ROEs and Tobin's *q*. Our results are robust for both the accounting-

[3] As a validity check, we rerun our tests based on a firm being in either the top five or top 25 percent of both measures classified as exhibiting sustained competitive advantage.

[4] Although ROE reflects the provision for income taxes, there is not a mathematical certainty between lower tax costs and increased firm performance (ROE), similar to the implementation of any other cost-minimizing strategy.

based and market-based sustained competitive advantage measures, alternative cut-offs at the top five percent and top 25 percent for classifying firms as enjoying competitive advantage, and all four tax management measures.

This paper should be of interest to the following readers: 1) strategic management academics as our study provides new insights into firm attributes which help sustain a competitive advantage; 2) managers as this paper highlights how operational efficiencies such as tax management play an important role in sustaining a competitive advantage; and 3) compensation committees and compensation consultants as this paper provides empirical evidence on the importance of focusing on achieving long-term rather than short-term accounting goals.

This paper is organized as follows: the next section discusses the sustainable competitive advantage literature, the third section develops the hypothesis, the fourth section describes the data, the fifth section presents the results, and the final section discusses the conclusions and directions for future research.

PRIOR LITERATURE

Industrial organization economic theory of perfect competition posits that firms are fundamentally homogeneous in terms of their resources and internal capabilities. Strategic management research has focused on more clearly understanding the attributes that allow some firms to maintain a sustainable competitive advantage by exhibiting relatively high profit levels for an extended period of time (Porter, 1985; Rumelt, 1991; Roberts, 1999). A sustainable competitive advantage occurs when a firm implements a value creating strategy that is not currently being implemented by potential competitors and when these competitors cannot duplicate the benefits by imitation or substitution (Barney, 1991).

The Resource Based View (RBV) model was developed during the 1990's to increase our understanding of the factors required to acquire a competitive advantage (Peteraf, 1993).[5] This model focuses on those resources controlled by the firm that are idiosyncratic and costly to copy (Barney, 2002). The RBV model suggests that if a firm: 1) possesses and exploits resources and capabilities that are both valuable, in that they reduce costs or provide value to customers, and rare it will attain a competitive advantage, 2) if these resources and capabilities are both inimitable and non-substitutable the firm can sustain the advantage, and 3) the attainment of such advantages will enable the firm to improve its long-term performance (Newbert, 2008).

Resources are physical, human, and organizational assets that can be used to implement value-creating strategies (Wernerfelt, 1984, 1995; Barney, 1986; Eisenhardt and Martin, 2000). Resources previously identified in the literature as potentially strategic include, among others: reputation, patents and unique knowledge (Barney and Arikan, 2001).

Crook *et al.* (2008) suggests that a competitive advantage is a necessary but not sufficient condition for a firm to experience a performance advantage over its competitors. Coff (1999) and Collis and Montgomery (1995) have cautioned that there is not a direct link between strategic resources and firm performance. Rather, strategic resources explain performance only to the extent that the firm captures the economic rent that they create (Barney and Clark, 2007). If stakeholders, such as suppliers, managers, customers or various governments, capture some of the rent, then the competitive advantage will not be revealed by usual accounting-based performance measures.

Not every superior resource provides a firm the opportunity to sustain its competitive advantage over time. *Ex post* limits to competition are necessary to preserve the condition of

[5] A recent meta-analysis suggests that the basic tenets of RBV are largely supported (See Crook *et al.*, 2008).

heterogeneity and achieve a sustainable competitive advantage. The abnormal profits will dissipate when other firms are able to replicate the superior resource/capability (Peteraf, 1993). When the superior resource/capability is immobile, a firm can extract rents from customers for an extended period of time. Resources that cannot be purchased, such as progressing down a learning curve and organizational culture, are more difficult to replicate, and therefore more likely to provide rents for an extended period of time (Conner, 1991).

The RBV view assumes that resources and capabilities are both heterogeneously distributed among firms and imperfectly mobile. These assumptions allow not only for differences across firms' resources but also for these differences to persist over time. Wang, He, and Mahoney (2009) suggests that a firm's ability to achieve and sustain a competitive advantage is directly related to the strength of the "isolating mechanisms" it creates to help protect its valuable and rare resources (Rumelt, 1984; Mahoney and Pandian, 1992). Important isolating mechanisms include specificity of resources that are not easily tradable or redeployable outside the firm (Dierickx and Cool, 1989). Reed and DeFillippi (1990) and Barney (1991) suggest that resources will give rise to a sustainable competitive advantage if they are difficult to transfer or require prior investment to utilize (Dierickx and Cool, 1989; Kogut and Zander, 1992). [6]

Dewar and Dutton (1986) and Greve (2009) suggest that innovations may also be a source of competitive advantage because they can be created rapidly by firms with high technological capabilities. The Dynamic Capability Framework extends the RBV into dynamic markets to better explain why some firms can create and sustain a competitive advantage where the

[6] Strategic management researchers have for years accepted the link between sustained competitive advantage and sustained superior performance as tautologous (Powell, 2001). Newbert (2008) empirically finds that competitive advantage is related to performance. Newbert (2007) reviews 55 articles testing hypotheses grounded in the RBV and reports that 51 (93 percent) utilize a performance-based dependent variable while one (two percent) utilizes a sustained performance measurement as the dependent variable.

competitive landscape is rapidly shifting (Teece, Pisano, and Shuen, 1997; Eisenhardt and Martin, 2000). A dynamic capability allows a firm to change its set of resources in order to renew itself in the face of a changing environment (Teece, Pisano, and Shuen, 1997; Danneels, 2011).

We argue that tax management, as an operational efficiency, is a dynamic capability. Not only do firms need to keep up with ever-changing tax laws, but they need to change their organizational processes and even locations in order to minimize explicit tax costs. To do so, firms not only invest in tax experts but also engage in lobbying to facilitate tax law changes (Kocieniewski, 2011).[7]

Tax management is also difficult to replicate as the specific details disclosed on corporate tax returns are not publicly available. In addition, the publicly available tax information disclosed in their annual Form 10-K is inadequate to determine how tax savings occur and impossible to determine precisely how much is paid in total and to various governments (Duhigg and Kocieniewski, 2012). In addition, duplication efforts are often stymied as tax management is an integral part of the overall organization design and is difficult to incorporate after a project is started (Scholes *et al.*, 2009).

HYPOTHESIS DEVELOPMENT

Dierickx and Cool (1989) and Barney (1991) suggest that sustaining a competitive advantage over time requires that the unique resource that creates the advantage have three attributes: 1) it must be valuable, in that it can exploit an opportunity or neutralize a threat, 2) it must be rare, in

[7] For example, G.E.s' tax department is often referred to as "the world's best tax law firm". In addition, G.E. has spent more than 200 million dollars for lobbying activities in the past decade (Kocieniewski, 2011).

that it is not easily available to the competition, and 3) it must not be easily imitated or substituted. Firms can make it more difficult and costly for competitors to reduce their competitive advantage by developing dynamic cost efficiency capabilities designed to extend, upgrade, and protect their unique resource (Rumelt, 1984, 1987; Dierickx and Cool, 1989; Barney, 1991). The wide range of alternative capabilities open to the firm implies that they may develop multiple cost efficiency capabilities to make it more difficult for rivals to duplicate their unique resource and allow them to sustain their competitive advantage as long as possible (D'Aveni *et al.*, 2010).

We suggest that tax management, like other operational efficiency activities, enables competitively advantaged firms to minimize explicit tax costs and free up additional resources that can be utilized to protect their unique asset base by making it more difficult (and cost ineffective) for competitors to imitate or substitute their unique resource. However, the tax expertise and technology that is required to fully exploit this strategy alternative may be difficult to acquire due to cost constraints (Barney, 1991). We suggest that the additional after-tax cash flows emanating from their unique resource provide competitively advantaged firms the opportunity to acquire these important tax resources as well as to absorb any additional associated compliance, political, and regulatory costs. We suggest that they will do so when the benefit of minimizing explicit tax costs exceeds the associated non-tax costs of doing so.

Businesses' focus on managing their explicit tax burden is not new. In 2011, corporate tax receipts fell to 1.16% of gross domestic product (GDP), which is less than half of the GDP level of 2.5% in 2000 and approximately 25% of the 4% level in 1965 (Byrnes, Gleckman, and Lavelle, 2003; McIntyre *et al*., 2011). The Citizens for Tax Justice (CTJ), a Washington-based

taxpayer lobby group recently surveyed the financial statements of 280 of the nation's largest companies and reported that:

> "While the federal corporate tax code ostensibly requires big corporations to pay a 35 percent corporate income tax rate, on average, the 280 corporations in our study paid only about half that amount. And many paid far less, including a number that paid nothing at all." (McIntyre *et al*., 2011).[8]

These decreases cannot be entirely explained by changes in tax rules. For example, companies as diverse as GE, Ford, Merrill Lynch, Microsoft, Cisco Systems, Compaq Computer, and Marriott International, have enhanced their tax management activities by staffing tax departments with tax experts hired from the government, law firms, accounting firms, and other companies (Byrnes *et al.*, 2003).

We suggest that competitively-advantaged firms are more likely to engage in significant tax minimization activities as an incremental additional efficiency measure to further extend the casual ambiguity that exists around its superior resource and its competitors with the goal of further limiting the non-advantaged firm's ability to imitate or substitute the superior resource (Rumelt, 1984, 1987). Therefore, we predict a negative association between a firm's sustained competitive advantage position and its relative level of explicit tax costs and hypothesize as follows:

H1: *Ceteris paribus*, firms with relatively lower explicit tax costs are more likely to exhibit sustainable competitive advantage.

METHODOLOGY AND DATA

Regression Model

[8] Enron, one of the spectacular successes of the 1990's, is reported to have paid virtually zero federal income taxes during the period 1996-2000 despite record book profits and a soaring stock price (McGill and Outslay, 2002; U.S. Congress, Joint Committee on Taxation, 2003).

We utilize a probit regression model to examine the association of tax management with sustainable competitive advantage. In its latent variable model form, the probit model can be specified as follows:

$$Y^* = X'\beta + \varepsilon,$$

where Y* is an auxiliary random variable and $\varepsilon \sim N(0, 1)$. Then Y can be viewed as an indicator for whether this latent variable is positive:

$$Y = \mathbf{1}_{\{Y^*>0\}} = \begin{cases} 1 & \text{if } Y^* > 0 \text{ i.e. } -\varepsilon < X'\beta, \\ 0 & \text{otherwise.} \end{cases}$$

Empirically, the probit model we estimate takes the following general form:

$$\begin{aligned} SCA_{i,t} = {} & \alpha + \beta_1 Cash\_ETR_{i,t} + \beta_2 ROA_{i,t} + \beta_3 Leverage_{i,t} + \beta_4 Size_{i,t} \\ & + \beta_5 Capital\_Intensity_{i,t} + \beta_6 Inventory\_Intensity_{i,t} + \beta_7 R\&D\_Intensity_{i,t} \\ & + \beta_8 Advertising\_Intensity_{i,t} + \beta_9 Foreign\_Intensity_{i,t} + \beta_{10} Industry_{i,t} \\ & + \epsilon_{i,t} \end{aligned}$$

where:

SCA	=	a dummy variable set to one if firm is defined as exhibiting a sustained competitive advantage and zero otherwise.
Cash_ETR	=	the five-year average of cash taxes paid scaled by the five-year average of pretax income less special items for firm *i*
ROA	=	the five-year average of pretax income scaled by the five-year average of total assets for firm *i*
Leverage	=	the five-year average long-term debt scaled by the five-year average of total assets for firm *i*
Size	=	the natural log of the five-year average of total assets for firm *i*
Capital_Intensity	=	the five-year average of net property, plant and equipment scaled by the five-year average of total assets for firm *i*
Inventory_Intensity	=	the five-year average of inventory scaled by the five-year average of total assets for firm *i*
R&D_Intensity	=	the five-year average of research and development expense scaled by the five-year average net sales for firm *i*
Advertising_Intensity	=	the five-year average advertising expense scaled by the five-year average net sales for firm *i*
Foreign_Intensity	=	the five-year average foreign pretax income scaled by the five-year average pretax income for firm *i*

Industry	=	a dummy variable (set one to 49) for firm *i*'s industry as defined in Fama and French (1997) and updated on Ken French's website as of June 8, 2005

Identifying Firms with a Sustained Competitive Advantage – the dependent variable

Based on Newbert (2008), we use two measures of firm-level economic performance to determine whether a firm exhibits a sustained competitive advantage. First, we utilize an accounting measure -- five-year average return on equity (ROE) as the dependent variable. ROE measures the after-tax return available to common shareholders and captures operating efficiencies such as tax management and utilizing debt for financial leverage (Stice, Stice, and Skousen, 2010).[9,10] Firms which exhibit a sustainable competitive advantage should maintain a higher level of economic performance over the long run.[11] Therefore, *SCA* will be set to one if firm *i* has a ROE measure that is in the top ten percent of all firms in our sample for that five-year period and set to zero otherwise.[12, 13]

[9] Prior research on competitive advantage typically uses a pretax measure that is closer to operating income as the authors are attempting to identify the source of the competitive advantage. However, any pretax measure puts firms that engage in tax management at a disadvantage as the expenses associated with tax management activities are included in operating expenses while the reduction in explicit taxes are not included in pretax measures. In addition, some pretax measures do not take into account other methods that managers can use to increase shareholder value such as the use of financial leverage and investing activities.

[10] We use common stockholders' equity rather than total stockholder's equity as the ownership interests of common shareholders are the true residual interests in a firm (Hartman *et al.,* 2000).

[11] A firm that has created a competitive advantage may have variation in ROE from year-to-year. For example, in year 1 the firm may create the advantage and then have lower profits in year two as they incur additional expenses to expand output to satisfy additional market demand.

[12] Our ROE dependent variable controls for systematic risk as we use a long-run (five years) measure of ROE as well as a comparative measure (we compare firm *i*'s ROE with the ROEs of the other firms in our sample).

[13] We also rerun our regressions with the dummy dependent variable set to one if firm *i* has a ROE or Tobin's *q* measure that is in the top five or 25 percent of all firms in our sample for that five-year period and set to zero otherwise. These results are discussed in the Supplemental Regression Analysis section.

Second, we use the five-year average of Tobin's *q* as a stock market-based measure of firm-level economic performance. Our proxy for Tobin's *q* is developed by Chung and Pruitt (1994) and only requires basic financial and accounting information.[14] Tobin's *q* reflects the stock market's expectations about the future growth and profitability potential of the firm as it captures the premium investors are willing to pay for the stock over the book value of the firm's assets (Kor and Mahoney, 2005). In this instance, *SCA* will be set to one if firm *i has* a five-year average Tobin's *q* that is in the top ten percent of all firms in our sample for that five-year period, and set to zero otherwise.

Test and Control Variables

Our primary independent variable of interest to test H1 is the cash effective tax rate (*Cash_ETR*), an observable measure of the explicit tax burden actually borne by firms in the form of cash taxes paid and publicly disclosed on financial statements. *Cash_ETR* is defined as the five-year average of the sum of federal, state, local, and foreign income taxes paid as reported on the statement of cash flows scaled by the five-year average of pretax income less special items. Because cash payments for taxes in any given year typically are a mixture of current year obligations, estimated taxes for the following year and any settlements for prior years, we follow Dyreng, Hanlon, and Maydew (2008) to construct our *Cash_ETR* measure as a five-year average that significantly reduces the spikes from any timing issues arising in any single year.[15] Since a

[14] The proxy for Tobin's *q* is the sum of the market value of equity (share price times number of common stock share outstanding), the value of outstanding preferred stock, short-term liabilities (net of short-term assets), and the book value of long-term debt divided by the book value of total assets. Chung and Pruitt (1994) show that this approximation explains at least 96.6 percent of the variability of Tobin's *q* calculated with the more theoretically correct model of Lindenberg and Ross (1981).

[15] Ratios are calculated by dividing the five-year average of the numerators by the five-year average of the denominators rather than simply taking the average of the yearly ratios. This methodology does not place higher weights on years with smaller denominators that would result by taking the average of the ratios.

lower *Cash_ETR* implies lower explicit tax burdens or more effective tax management, we expect that the sign of the estimated coefficient of Cash_*ETR* will be negative.

We also include other independent variables designed to either control for firm-specific or industry-specific factors that have been found in prior studies to be determinants of a firm's tax rate and/or financial performance. Gupta and Newberry (1997) investigate firm size, leverage, capital intensity, inventory intensity, R&D intensity, and ROA as determinants of corporate effective tax rates. Capon, Farley, and Hoeing (1990) perform a meta-analysis using 320 published studies relating to financial performance that includes variables such as capital intensity, firm size, advertising intensity, R&D intensity, and leverage.

ROA is the ratio of average pretax income in the five-year period divided by average total assets for the five-year period. We predict a positive relationship between this variable and the dependent variable as firms with a higher ROA should exhibit a higher ROE, *ceteris paribus*.[16]

Leverage is the ratio of the average long-term debt in the five-year period divided by the average total assets for the five-year period. We predict a positive relationship between this measure of financial leverage and ROE as profitable firms are expected to judiciously use debt to maximize shareholder returns.

Our remaining variables are intended to control for other factors that would influence a firm's competitive advantage position, including firm size, capital intensity, inventory intensity, R&D intensity, advertising intensity, foreign intensity and industry placement. *Size* is the natural logarithm of the average total assets for the five-year period. *Capital_Intensity* is the ratio of the average net property, plant, and equipment (PPE) in the five-year period divided by the average

[16] Normally, ROE is equal to ROA multiplied by financial leverage (ROE = net income / total equity; ROA = net income / total assets; and leverage = total assets / total equity). Similar to Gupta and Newberry (1997), our measure of ROA incorporates pretax income in the numerator rather than net income to minimize endogenity.

total assets for the five-year period. *Inventory_Intensity* is the ratio of the average inventory in the five-year period divided by the average total assets for the five-year period. *R&D_Intensity* is the ratio of the average research and development (R&D) expense in the five-year period divided by the average sales for the five-year period. *Advertising_Intensity* is the ratio of the average advertising expense in the five-year period divided by the average sales for the five-year period. *Foreign_Intensity* is the ratio of the average foreign pretax income in the five-year period divided by the average pretax income for the five-year period. *Industry* is a dummy variable (set one to 49) for the firms industry as defined in Fama and French (1997) and updated on Ken French's website as of June 8, 2005.[17] We make no predictions of the relationship between these control variables and the dependent variable.[18]

Sample Selection and Data

Sample Selection

We form an unbalanced panel by initially selecting every corporate firm in Standard & Poor's *Compustat* database that has the required data for six consecutive years in the period from 1986 (the year of the last major revision to the Internal Revenue Code) thru 2010. [19] Following Dyreng *et al.* (2008), we construct long-run measures based on five-year time periods.[20] Ratios are calculated by dividing the five-year average of the numerators by the five-year average of the denominators rather than simply taking the average of the yearly ratios. This methodology does

[17] http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/Data_Library/changes_ind.html, modified June 8, 2005, accessed September 20, 2010.

[18] A meta-analysis performed by Capon *et al.* (1990) found a significant negative relationship between firm financial performance and capital intensity and a significant positive relationship between firm financial performance and both R&D intensity and advertising intensity in the results of the studies included in their analysis.

[19] 1986 data (the year prior to the enactment of the Tax Reform Act of 1986) is used solely to obtain beginning of the year (1987) balance sheet items.

[20] Dyreng *et al.* (2008) use one-, five- and ten-year time periods and find that one-year cash effective tax rates are not very good predictors of long-run cash effective tax rates. We use five-year time periods, as our analysis compares long-term tax rates with long-term financial performance, both of which are mean-reverting.

not place higher weights on years with smaller denominators that would result by taking the average of the ratios. However, unlike Dyreng *et al.* (2008), some of our ratios incorporate balance sheet variables rather than just income statement variables. Since the income statement variables report data for a full year and the balance sheet reports data at the end of the year, we utilize a sixth year of data for balance sheet items to obtain beginning-of-the-year data as well as end-of-the-year data for each of the five years in each observation.[21]

We require firms to be incorporated in the U.S. and delete noncorporate firms.[22] We require each observation in our sample to be a firm with five consecutive years (t = 1 to 5) of required income statement and statement of cash flows data and six corresponding years (t = 0 to 5) of balance sheet data.[23] The required income statement data are sales, pretax income and net income.[24] The required statement of cash flows data are cash taxes paid. The required balance sheet data are total assets and common equity.[25]

Given that the federal corporate income tax rate schedule is progressive up to taxable income of $18.333 million but corporations earning more than that face a flat 35% rate, we begin our sample with all firms on *Compustat* with pretax income of $18.333 million in any year within the

[21] For example, *Average Total Assets* = [*Total Assets*$_{t=0}$ + 2($\sum_{t=1}^{4}$ *Total Assets*$_t$) + *Total Assets*$_{t=5}$] / 10. A simple average, while not technically correct, does not significantly change the results (or inferences).

[22] We delete Real Estate Investment Trusts (SIC code 6798), and firms with names ending in "-LP" containing "TRUST" and firms with six-digit CUSIPs ending in "Y" or "Z" primarily because REITS, limited partnerships and trusts are generally considered "conduit" entities that do not pay any federal income tax at the entity level; their profits are passed on to the owners who are subject to tax on their share of the income at the personal level.

[23] The same firm could be in several observations as there are several different consecutive five-year periods from 1986 to 2009.

[24] We require average sales in the five-year period to be positive. We also require that pretax income (our proxy for taxable income) to be greater than $18.333 million in each of the five consecutive years as any firm with taxable income over this amount is in the 35 percent tax rate bracket. If advertising expense, R&D expense, special items or foreign pretax income is missing in any of the five years, we set them to zero. We also set negative amounts of foreign pretax income to zero.

[25] We set missing values of inventory, PPE and long-term debt in any of the six years to zero.

consecutive five years.[26] From our beginning sample of 23,078 firm-year observations (3,085 firms), we delete 4,732 observations (446 firms) due to other missing data required in any of the consecutive five years.[27] In addition, we delete 36 observations (3 firms) as outliers.[28] Therefore, our final sample has 18,310 firm-year observations consisting of 2,636 firms. Table 1 summarizes the sample selection procedure.

-- INSERT TABLE 1 ABOUT HERE --

Data and Descriptive Statistics

Table 2 reports our descriptive statistics. We include data on firms with five-year average ROEs and Tobin's *q* in the top ten percent of all firms in our sample for the five-year period as well as firms with five-year average ROEs and Tobin's *q* in the lower 90 percent of all firms in our sample. Panel A reports the means and medians of *Cash_ETR, our proxy for tax management,* as well as the three alternate tax management variables used in our supplemental regression analysis. Both *Cash_ETR* and *Book_ETR* (the effective tax rate reported in financial statements) shows the firms in the top ten percent of all firms in our sample have slightly lower tax rates than the remainder of the firms in our sample. However, firms in the top ten percent of all firms in our sample have higher *Current_ETRs* (the current portion of tax expense scaled by pretax income less special items) and *MTRs* (marginal tax rates).

-- INSERT TABLE 2 ABOUT HERE --

[26] We use pretax income as a proxy for taxable income as taxable income is not reported.

[27] Other required data includes net sales, pretax income, net income, total assets, common equity, and cash taxes paid.

[28] Outliers are determined by abnormal values of Cook's influence on predictive value, leverage, standard influence statistic, and/or studentized residuals using an ordinary least squares regression. Typically, these observations have negative net income in prior years, suggesting these firms have net operating loss carryforwards.

Descriptive statistics for the remainder of our non-dummy regression variables are shown in Table 2, Panel B. Firms with higher ROEs or Tobin's *q* appear to have, on average, over twice the ROA as the remainder of our sample, are smaller, have a smaller percentage of assets invested in PPE, invest a larger percentage of sales in R&D and advertising and derive a larger percentage of pretax income from foreign sources. Firms with higher ROEs have a larger percentage of assets invested in inventory while firms with higher Tobin's *q* use less debt than the remainder of the sample.

Panel C of Table 2 provides descriptive statistics on selected *Compustat* data used to calculate our regression variables. Again, we include data on firms with five-year average ROEs and five-year average Tobin's *q* in the top ten percent of all firms in our sample for the five-year period as well as firms with five-year average ROEs and Tobin's *q* in the remaining 90 percent of all firms in our sample. Firms with higher ROEs or Tobin's *q* tend to have higher pretax income and pay more income taxes. Firms with higher ROEs tend to have higher sales than the remainder of the sample while firms with higher Tobin's *q* tend to have lower sales. Firms in the top 10 percent of ROE have a mean ROE of 55.5 percent compared to 11.0 percent for the remainder of the sample. Firms in the top 10 percent of Tobin's *q* have a mean Tobin's *q* of 4.208 compared to 1.024 for the remainder of the sample.

EMPIRICAL RESULTS

Correlations

Spearman correlation coefficients for our regression variables are reported in Table 3. *R&D_Intensity* and *Foreign_Intensity* have a correlation coefficient of 0.57. *ROA* has correlation

coefficients of -0.42 and -0.50 with *Leverage* and *Size*. In addition, *Leverage* and *Capital_Intensity* have a correlation coefficient of 0.41. To address concerns that these correlations may be harmful in interpreting the regression results, we rerun our probit regressions excluding *Foreign_Intensity*, *Leverage*, and *Size* from the model.[29] These results, which are not reported, suggest that harmful collinearity is not a significant issue in our data.

-- INSERT TABLE 3 ABOUT HERE --

Regression Results

Table 4 presents our regression results for the ROE sample in Column 2, and the Tobin's q sample in Column 4.

Model Selection Tests

Stata's xtprobit function allows for probit regression of panel data using either random-effects or population-average probit models (StataCorp, 2009). The random-effects model is calculated using adaptive Gauss-Hermite quadrature to compute the log likelihood and its derivatives. The estimation coefficients may be confidently interpreted when the results do not differ substantially as the number of integration points are changed (StataCorp, 2009). Using quadchk, we get acceptable results using 50 to 100 fitted quadrature integration points for our main regressions.[30]

Hypothesis 1

The results for firms with five-year average ROEs in the top 10 percent of the sample are presented in Table 4, Column 2. Consistent with H1, the estimated coefficient on *Cash_ETR* is

[29] *ROA* is not excluded due to the high correlation between this variable and the dependent variable which could result in a correlated omitted variable problem. In addition, there are no significant changes noted when *R&D_Intensity* is excluded in lieu of *Foreign_Intensity*.

[30] Quadchk checks the quadrature approximation by refitting the model for different numbers of quadrature points and then comparing the results (StataCorp, 2009). Our relative differences were less than 0.01 percent in all instances when the number of integration points is varied by approximately plus and minus 33 percent.

significantly negative ($p < 0.001$), indicating that the average firm with a five-year average ROE in the top 10 percent of the sample has a lower cash effective tax rate (cash ETR) compared with the remainder of the sample. Column 4 reports similar results for the Tobin's *q* dependent variable, with the estimated coefficient on *Cash_ETR* again significantly negative ($p < 0.001$), providing additional support for H1.[31] A comparison between columns 1 and 2 as well as between columns 3 and 4 shows a modest increase in the pseudo *r*-squares indicating that tax management helps to explain sustainable competitive advantage. This is consistent with Porter's (1996) assertion that sustainability of a competitive advantage requires both strategy and operational efficiency.

-- INSERT TABLE 4 ABOUT HERE --

Other Findings

In addition, the estimated coefficients from the other explanatory variables provide some interesting insights. In Table 4, Column 2, both *ROA* and *Leverage* are significant in the predicted direction ($p < 0.001$). This suggests firms exhibiting a sustained competitive advantage tend to have higher ROAs and carry higher levels of debt. The estimated coefficient of *Size* is significantly positive ($p < 0.001$), indicating that firms which exhibit a sustained competitive advantage tend to be larger. Firms with higher five-year average ROEs tend to operate globally as our measure of foreign-earned pretax income is positive and significant.

These firms exhibiting a sustained competitive advantage also tend to be less capital intensive and spend fewer sales dollars on R&D as these control variables have negative

[31] This result is consistent with Simone and Stromberg (2013) who find a negative association between current Tobin's *q* and long-run cash taxes paid.

coefficients and are significant ($p < 0.001$). Statement of Financial Accounting Standards Number 2 (FAS No. 2) requires that all R&D costs to be charged to expense when occurred rather than written off over the period that the benefits occur (FASB, 1974). Lev, Sarath, and Sougiannis (2005) report that 58 percent of the firm-years in their 1972 to 2003 *Compustat* sample had a higher R&D growth rate than ROE, which may explain the negative coefficient on our R&D variable.

There is a 37.4 percent correlation between the ROE sample and the Tobin's *q* sample in the top ten percent of our sample respectively.[32] Therefore, it is interesting to note the differences between the ROE and Tobin's *q* regressions reported in Columns 2 and 4 of Table 4. Return on assets continues to be significant in the predicted direction ($p < 0.001$) in the Tobin's *q* regression. However, *Leverage* becomes insignificant in the Tobin's *q* regression. Firm size becomes negative and significant in the Tobin's *q* regression suggesting investors find smaller firms more attractive. Capital intensity and foreign operations become insignificant in the Tobin's *q* regression. Our results indicate that investors find firms that invest in R&D and advertising attractive as these variables are positive and significant in the Tobin's *q* regression. Conversely, investors are not attracted to firms with large amounts of inventory as this variable is negative and significant in the Tobin's *q* regression.

[32] Approximately 43 percent of the observations in the top ten percent of ROE are also in the top ten percent of Tobin's *q*.

Robustness Tests

Industry-Adjusted ROE

Our main regression model controls for industry effects by the inclusion of an industry dummy variable, *Industry*. Mueller (1990) finds that firm characteristics are more important than industry characteristics in accounting for differences in long run profit levels.[33] However, a firm may not be able to move from an unprofitable into a profitable industry quickly. Therefore, we also report results for an industry-adjusted ROE as the dependent variable in Table 5. This variable is set to one if firm *i* has a five-year average net income divided by the five-year average common equity that is in the top 10 percent of all firms within its industry in our sample for that five-year period, and set to zero otherwise. Again, industry membership is determined using Fama and French's (1997) 49 separate industry classifications as updated on Ken French's website as of June 8, 2005. As we require a minimum of 10 firms in every industry classification in each five-year period our sample size is decreased. This restriction also reduces the generalizability of our study as some industry classifications are eliminated. The results using an industry-adjusted ROE also provide support for H1 as the estimated coefficients on *Cash_ETR* are significantly negative.

-- INSERT TABLE 5 ABOUT HERE --

Alternative Proxies of a Sustainable Competitive Advantage

As a validity check we also construct dependent variables based on a firm being in either the top five or top 25 percent of all firms in our sample for that five-year period. We rerun all

[33] In the short-run, a Schumpeterian shock may affect the profitability of different industries differently. However, in the long-run, if an industry does not achieve a normal level of profitability, they will not be able to attract or keep investors. This is suggested in Table 2, Panel B as 48 of the 49 separate industry classifications are represented in the top 10 percent of five-year average ROE (the missing industry consists of only 15 of the 18,310 observations).

regressions presented in the paper. These results, which are not reported, show no significant changes to those presented in the paper except as discussed in the Alternative Proxies of Tax Management subsection.

One of our metrics for a sustainable competitive advantage is based on ROE, which is an after-tax measure. Therefore, we also construct a pretax dependent variable based on pretax income less special items. This is a dummy variable set to one if firm *i* has a five-year average pretax income less special items divided by the five-year average common equity that is in the top 10 percent of all firms in our sample for that five-year period, and set to zero otherwise. We rerun the main regression as well as the reduced variable set discussed in the Correlations subsection with this pretax dependent variable. These results, which are not reported, show no significant changes to those presented in Table 4, Column 1.

In addition, we run the reduced variable set discussed in the Correlations subsection with a fourth dependent variable based on pretax income. This is a dummy variable set to one if firm *i* has a five-year average pretax income divided by the five-year average common equity that is in the top 10 percent of all firms in our sample for that five-year period, and set to zero otherwise. Again, the results show no significant changes to those discussed in the Correlations subsection.

Alternative Proxies of Tax Management

To test the sensitivity of our results to our main tax management proxy, *Cash_ETR*, we reestimate our results using other tax management proxies. First, firms report an annual effective tax rate in their financial statements which is the total income tax expense for accounting purposes divided by pretax income. Firms also disclose a reconciliation between this ETR and the statutory tax rate, which has been 35 percent throughout our sample period. Firms' ETRs per books differ from the statutory tax rate for only permanent tax differences, such as tax-exempt

interest income or non-deductible expenses. Firms have an incentive to minimize their total tax expense reported on their financial statements in order to maximize their net income. We construct a long-run book ETR variable, *Book_ETR*, by dividing the five-year average of total tax expense by the five-year average of pretax income. Columns 1 and 2 in Panel A of Table 6 report the probit regression results for the ROE and Tobin's *q* dependent variables, respectively. Both of the estimated coefficients of *Book_ETR* are significantly negative ($p < 0.01$), providing additional support for H1.

-- INSERT TABLE 6 ABOUT HERE --

Second, due to the time value of money, firms have incentives to defer taxes into later years; hence, arguably the deferred taxes can be viewed as the tax burdens of that future period. However, the numerator of *Book_ETR* is the sum of current and deferred income tax expense. Therefore, we construct another long-run variable, *Current_ETR*, which captures only the current portion of the sum of federal, foreign and state income tax expense in the numerator and scales the five-year average of this sum by the five-year average of pretax income less special items. This variable removes the effects of both temporary and permanent book-tax differences. As shown in Columns 1 and 2 in Panel B of Table 6, the estimated coefficients of *Current_ETR* variables are significantly negative ($p < 0.001$), providing additional support for H1.

Finally, the firm's marginal tax rate (MTR) is the highest rate at which an additional dollar of income is taxed. The firm's MTR is affected by tax-planning decisions that are undertaken to alter its investment and financing activities (Scholes *et al*., 2009). A reasonable estimation of a firm's MTR requires a forecast of future taxable income based on the firm's historical taxable income (Scholes *et al*., 2009). Graham, Lang, and Shackeleford (2004) developed a simulation approach that incorporates net operating loss carryback and carryforward rules, tax credits, the

corporate alternative minimum tax, and the employee stock option tax deduction. Firm specific simulations from 1980 thru 2010 are available on John Graham's website.[34] We use these simulations to construct a five-year average MTR variable, *MTR*. The data requirements for *MTR* reduce our sample size by approximately 45 percent. In Panel C of Table 6, the estimated coefficient of *MTR* in the ROE regression is significantly negative ($p < 0.001$), providing further support for H1. The estimated coefficient of *MTR* in the Tobin's *q* regression is not significant and is the only model that does not provide support for H1.

Fixed Effects

Fixed effects methods help control for omitted variable bias by having firms serve as their own controls. However, fixed effects do not control for unobserved variables that change over time (Allison, 2009). The probit model does not lend itself to a fixed effects treatment due to the incidental parameters problem (Baltagi, 2009). Some statistical software packages offer fixed effects for logistic regressions of panel data.

Independent variables must change across time for a substantial portion of the firms or they are omitted in a fixed effects model (Allison, 2009). As a result, the fixed effects logit regressions for our ROE and Tobin's *q* models omit the *ind* independent variable.

Fixed effects estimates use only within-firm differences and essentially discard information about differences between firms. Dependent variables must be measured at least twice for each firm in the sample. Firms are dropped if the dummy dependent variable does not vary over time (Allison, 2009). Subsequently, our fixed effects regressions dropped 14,488 of the 18,310 observations in the ROE model and 15,624 observations in the Tobin's *q* model. These results,

[34] http://www.duke.edu/~jgraham/restricted/ accessed August 31, 2011.

which are not reported, provide support for H1 as the estimated coefficient on *Cash_ETR* is significantly negative in both regressions.

Summary

Our results indicate that firms with long-run tax management strategies exhibit consistently high ROEs or consistently high Tobin's *q*. This result is robust when we use an industry ROE measure and for several different proxies for tax management (cash income taxes paid, book effective tax rates, or marginal tax rates). Our results indicate that firms in the top 10 percent of five-year average ROE in our sample pay 32.7% less income taxes per dollar of pretax income in a five year period compared with the remainder of the firms in our sample.[35] Therefore, the mean (median) firm in the top ten percent of five-year average ROE in our sample saves approximately $47 ($13) million annually in taxes than the remainder of the firms in our sample.

CONCLUSIONS AND DIRECTIONS FOR FUTURE RESEARCH

This paper examines whether tax management helps explain forms' sustained competitive advantage over other firms through relatively lower explicit tax costs. Using both an accounting-based measure of sustained competitive advantage (return on equity) and a market-based measure (Tobin's *q*), we find that firms exhibiting sustained competitive-advantaged pay relatively lower explicit taxes per dollar of pre-tax income than non-advantaged firms. This result is robust when we use an industry-adjusted ROE measure and for several different proxies for tax management (cash income taxes paid, ETRs, current portion of income tax expense, and MTRs). We also find that firms that have high ROEs tend to be larger, have higher relative ROA levels, carry higher levels of debt, be less capital intensive and spend fewer sales dollars on

[35] We divide the probit estimated coefficients by 2.5 (Wooldridge, 2002).

R&D. This last result is consistent with Lev *et al*. (2005) who report that 58 percent of the firm-years in their 1972 to 2003 *Compustat* sample had a higher R&D growth rate than ROE. Our results extend the strategic management literature by showing that tax management plays an important role in sustaining a firm's competitive advantage.

This study provides insight on how tax management plays a role in sustaining a competitive advantage. Tax management may not be generalizable to other activities leading to operational efficiency. Future research may want to investigate other sources of operational efficiency.

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TABLE 1
Sample Selection

Criterion	Observations	Firms
Observations with $18.333 million or more of pretax income reported in each of five consecutive years from 1987 to 2010	23,078	3,085
Less: observations with total assets not reported in any of six consecutive years	189	54
Observations with total assets reported in each of six consecutive years	22,889	3,031
Less: observations with net sales not reported in any of five consecutive years[a]	56	12
Observations with net sales reported in each of five consecutive years	22,833	3,019
Less: observations with common equity not reported in any of six consecutive years	32	4
Observations with common equity reported in each of six consecutive years	22,801	3,015
Less: observations with net income not reported in any of five consecutive years	0	0
Observations with net income reported in each of five consecutive years	22,801	3,015
Less: observations with cash taxes paid not reported in any of five consecutive years	4,455	376
Observations with cash taxes paid reported in each of five consecutive years	18,346	2,639
Less: outliers[b]	36	3
Final regression sample	18,310	2,636

[a] Eleven observations (three firms) with average sales less than zero for the five-year period are also deleted.

[b] Outliers are determined by abnormal values of Cook's influence on predictive value, leverage, standard influence statistic, and/or studentized residuals using an ordinary least squares regression. Typically, these observations have negative net income in prior years, suggesting these firms have net operating loss carryforwards.

TABLE 2
Descriptive Statistics

Panel A: Means (Medians) of Tax Management Variables

	ROE Regression		Tobin's *q* Regression	
Variable	Top 10%[a]	Bottom 90%[b]	Top 10%[c]	Bottom 90%[d]
Cash_ETR	0.277	0.283	0.266	0.285
	(0.287)	(0.291)	(0.280)	(0.292)
Book_ETR	0.327	0.344	0.337	0.343
	(0.354)	(0.360)	(0.359)	(0.360)
Current_ETR	0.317	0.302	0.328	0.301
	(0.329)	(0.317)	(0.340)	(0.316)
MTR	0.342	0.340	0.347	0.339
	(0.350)	(0.350)	(0.350)	(0.350)

(continued on next page)

Panel B: Means (Medians) of Control Variables[e]

Variable	ROE Regression		Tobin's *q* Regression	
	Top 10%[a]	Bottom 90%[b]	Top 10%[c]	Bottom 90%[d]
ROA	0.215 (0.203)	0.101 (0.085)	0.249 (0.236)	0.097 (0.084)
Leverage	0.204 (0.178)	0.205 (0.205)	0.100 (0.042)	0.217 (0.218)
Size	7.446 (7.338)	7.702 (7.547)	6.935 (6.664)	7.759 (7.608)
Capital_Intensity	0.272 (0.234)	0.375 (0.314)	0.243 (0.205)	0.379 (0.320)
Inventory_Intensity	0.111 (0.084)	0.098 (0.042)	0.096 (0.068)	0.100 (0.042)
R&D_Intensity	0.024 (0.000)	0.013 (0.000)	0.048 (0.010)	0.010 (0.000)
Advertising_Intensity	0.023 (0.003)	0.008 (0.000)	0.021 (0.003)	0.008 (0.000)
Foreign_Intensity	0.174 (0.026)	0.115 (0.000)	0.180 (0.030)	0.114 (0.000)
Number of Industries	48	49	42	49
Number of Firms	519	2,502	400	2,495
Number of Observations	1,815	16,495	1,838	16,472

(continued on next page)

Panel C: Means (Medians) of Selected *Compustat* Variables used in Computing the Regression Variables[e]

Variable	ROE Regression		Tobin's *q* Regression	
	Top 10%[a]	Bottom 90%[b]	Top 10%[c]	Bottom 90%[d]
Sales ($ Millions)	7,094 (1,641)	4,764 (1,410)	4,108 (916)	5,094 (1,488)
Pretax Income ($ Millions)	1,111 (270)	520 (150)	790 (187)	555 (154)
Cash Taxes Paid ($ Millions)	303 (69)	143 (40)	199 (46)	155 (42)
Return on Equity	0.555[e] (0.359)	0.110 (0.139)	0.276[e] (0.252)	0.140 (0.140)
Tobin's *q*	2.769 (2.316)	1.186 (0.945)	4.208 (3.615)	1.024 (0.924)

(continued on next page)

TABLE 2 (continued)

[a] "Top 10%" refers to the observations with the dependent variable set equal to one as the firm's five-year average return on equity (ROE) is in the top 10 percent of all sample firms in the five-year period, respectively.
[b] "Bottom 90%" refers to the observations with the dependent variable set equal to zero as the firm's five-year average ROE is in the bottom 90 percent of all sample firms in the five-year period.
[c] "Top 10%" refers to the observations with the dependent variable set equal to one as the firm's five-year average Tobin's *q* approximation is in the top 10 percent of all sample firms in the five-year period, respectively.
[d] "Bottom 90%" refers to the observations with the dependent variable set equal to zero as the firm's five-year average Tobin's *q* approximation is in the bottom 90 percent of all sample firms in the five-year period.
[e] Observations included in the main (*Cash_ETR*) regressions.
[f] One observation with an extremely high ROE is deleted. This observation is not influential in the probit regressions as ROE is instrumentalized as a dummy variable.

Variable Definitions:

Cash_ETR	=	the five-year average of cash taxes paid (from the statement of cash flows) (*Compustat* variable TXPD) scaled by the five-year average of pretax income (*Compustat* variable PI) less special items (*Compustat* variable SPI) for firm *i*;
Book_ETR	=	the five-year average of income tax expense (*Compustat* variable TXT) scaled by the five-year average of pretax income for firm *i*;
Current_ETR	=	the five-year average of the current portion of income taxes, the sum of federal, foreign and state income taxes (the sum of *Compustat* variables TXFED, TXFO, and TXS) scaled by the five-year average of pretax income less special items for firm *i*;
MTR	=	the simulations of firm *i*'s marginal tax rate as developed by Graham *et al.* (2004) and available on John Graham's website (http://www.duke.edu/~jgraham/restricted/);
ROA	=	the five-year average of pretax income scaled by the five-year average of total assets (*Compustat* variable AT) for firm *i*;
Leverage	=	the five-year average long-term debt (*Compustat* variable DLTT) scaled by the five-year average of total assets for firm *i;*
Size	=	the natural log of the five-year average of total assets (in millions) for firm *i*;
Capital_Intensity	=	the five-year average of net property, plant and equipment (*Compustat* variable PPENT) scaled by the five-year average of total assets for firm *i*;
Inventory_Intensity	=	the five-year average of inventory (*Compustat* variable INVT) scaled by the five-year average of total assets for firm *i*;
R&D_Intensity	=	the five-year average of research and development expense (*Compustat* variable XRD) scaled by the five-year average net sales (*Compustat* variable SALE) for firm *i*;
Advertising_Intensity	=	the five-year average advertising expense (*Compustat* variable XAD) scaled by the five-year average net sales for firm *i*;
Foreign_Intensity	=	the five-year average foreign pretax income (*Compustat* variable PIFO) scaled by the five-year average pretax income for firm *i*;
Sales	=	five-year average net sales (in millions) for firm *i*;
Pretax Income	=	five-year average pretax income (in millions) for firm *i* (observations dropped if less than $18.333 million is any of the five years);
Cash Taxes Paid	=	five-year average cash taxes paid (from the statement of cash flows) (in millions) for firm *i*;
ROE	=	five-year average net income (*Compustat* variable NI) divided by the five-year average common equity (*Compustat* variable CEQ)for firm *i*; and
Tobin's *q*	=	five-year average of the sum of the market value of equity, common shares outstanding times the annual closing price (*Compustat* variables CSHO times PRCC_F), the value of outstanding preferred stock (*Compustat* variable PSTKL), short-term liabilities (net of short-term assets) (*Compustat* variables LCT minus ACT), and the book value of long-term debt divided by the five-year average of total assets for firm *i*.

TABLE 3
Spearman Correlation Matrix

	ROE	*Tobin's q*	*Cash_ ETR*	*ROA*	*Leverage*	*Size*	*Capital_ Intensity*	*Inventory_ Intensity*	*R&D_ Intensity*	*Advertising_ Intensity*	*Foreign_ Intensity*
Cash_ETR	**-0.02**	**-0.04**									
ROA	**0.34**	**0.46**	**0.16**								
Leverage	**-0.02**	**-0.27**	**-0.14**	**-0.42**							
Size	**-0.05**	**-0.17**	**-0.17**	**-0.50**	**0.25**						
Capital_ Intensity	**-0.10**	**-0.13**	**-0.03**	**-0.07**	**0.41**	**0.03**					
Inventory_ Intensity	**0.03**	0.00	**0.17**	**0.31**	**-0.08**	**-0.22**	**-0.01**				
R&D_ Intensity	**0.12**	**0.23**	**-0.11**	**0.31**	**-0.23**	**-0.08**	**-0.21**	**0.31**			
Advertising_ Intensity	**0.18**	**0.19**	**0.07**	**0.30**	**-0.16**	**-0.07**	**-0.15**	**0.24**	**0.12**		
Foreign_ Intensity	**0.11**	**0.12**	**-0.11**	**0.21**	**-0.14**	**0.07**	**-0.23**	**0.27**	**0.57**	**0.14**	
Industry	**-0.05**	**-0.01**	**-0.03**	**-0.20**	**-0.16**	**0.09**	**-0.27**	**-0.28**	**-0.27**	**-0.05**	**-0.20**

(continued on next page)

TABLE 3 (continued)

Spearman correlation coefficients appear in the lower diagonals. Bolded font indicates a statistically significant correlation at the $p \leq 0.05$ level.

Variable Definitions:

ROE	=	a dummy variable set equal to one if firm *i*'s five-year average return on equity is in the top ten percent of all sample firms in the five-year period, set equal to zero otherwise;
Tobin's q	=	a dummy variable set equal to one if firm *i*'s five-year average Tobin's *q* approximation is in the top ten percent of all sample firms in the five-year period, set equal to zero otherwise;
Cash_ETR	=	the five-year average of cash taxes paid scaled by the five-year average of pretax income less special items for firm *i*;
ROA	=	the five-year average of pretax income scaled by the five-year average of total assets for firm *i*;
Leverage	=	the five-year average long-term debt scaled by the five-year average of total assets for firm *i;*
Size	=	the natural log of the five-year average of total assets for firm *i*;
Capital_Intensity	=	the five-year average of net property, plant and equipment scaled by the five-year average of total assets for firm *i*;
Inventory_Intensity	=	the five-year average of inventory scaled by the five-year average of total assets for firm *i*;
R&D_Intensity	=	the five-year average of research and development expense scaled by the five-year average net sales for firm *i*;
Advertising_Intensity	=	the five-year average advertising expense scaled by the five-year average net sales for firm *i*;
Foreign_Intensity	=	the five-year average foreign pretax income scaled by the five-year average pretax income for firm *i*; and
Industry	=	a dummy variable (set one to 49) for firm *i*'s industry as defined in Fama and French (1997) and updated on Ken French's website as of June 8, 2005.

TABLE 4
Main Probit Regression Results

Dependent Variable:	*ROE*		*Tobin's q*	
Variable (Expected Sign)	Coefficient (Std. Err.)	Coefficient (Std. Err.)	Coefficient (Std. Err.)	Coefficient (Std. Err.)
Cash_ETR		-0.818***		-4.765***
(-)		(0.331)		(0.587)
ROA	24.072***	24.092***	33.635***	34.502***
(+)	(0.796)	(0.795)	(1.357)	(1.394)
Leverage	4.222***	4.183***	0.132	-0.118
(+)	(0.276)	(0.275)	(0.447)	(0.446)
Size	0.212***	0.205***	-0.177***	-0.193***
(?)	(0.038)	(0.038)	(0.058)	(0.059)
Capital_Intensity	-0.716***	-0.726***	0.399	0.329
(?)	(0.235)	(0.234)	(0.387)	(0.383)
Inventory_Intensity	-0.762*	-0.645	-3.825***	-3.169***
(?)	(0.458)	(0.458)	(0.715)	(0.713)
R&D_Intensity	-3.915**	-4.346***	20.583***	18.539***
(?)	(1.614)	(1.618)	(1.983)	(1.990)
Advertising_Intensity	1.337	1.473	4.483*	5.102**
(?)	(1.847)	(1.841)	(2.354)	(2.362)
Foreign_Intensity	0.545**	0.508**	-0.212	-0.492
(?)	(0.222)	(0.222)	(0.324)	(0.331)
Industry	0.002	0.002	0.011	0.009
(?)	(0.005)	(0.005)	(0.007)	(0.007)
Intercept	-8.383***	-8.081***	-8.406***	-6.986***
(?)	(0.424)	(0.438)	(0.611)	(0.625)
Observations	18,310	18,310	18,310	18,310
Log-likelihood value	-2,726	-2,723	-1,773	-1,738
Pseudo *R*-squared	0.2704	0.2713	0.4084	0.4200

(continued on next page)

TABLE 4 (continued)

*, **, *** Significance at the ten percent, five percent, and one percent levels, respectively, using one-tailed tests for coefficients with a predicted sign and two-tailed tests for all other coefficients.

Variable Definitions:

ROE	=	a dummy variable set equal to one if firm *i*'s five-year average return on equity is in the top ten percent of all sample firms in the five-year period, set equal to zero otherwise;
Tobin's_q	=	a dummy variable set equal to one if firm *i*'s five-year average Tobin's *q* approximation as defined by Chung and Pruitt (1994) is in the top ten percent of all sample firms in the five-year period, set equal to zero otherwise;
Cash_ETR	=	the five-year average of cash taxes paid scaled by the five-year average of pretax income less special items for firm *i*;
ROA	=	the five-year average of pretax income scaled by the five-year average of total assets for firm *i*;
Leverage	=	the five-year average long-term debt scaled by the five-year average of total assets for firm *i;*
Size	=	the natural log of the five-year average of total assets for firm *i*;
Capital_Intensity	=	the five-year average of net property, plant and equipment scaled by the five-year average of total assets for firm *i*;
Inventory_Intensity	=	the five-year average of inventory scaled by the five-year average of total assets for firm *i*;
R&D_Intensity	=	the five-year average of research and development expense scaled by the five-year average net sales for firm *i*;
Advertising_Intensity	=	the five-year average advertising expense scaled by the five-year average net sales for firm *i*;
Foreign_Intensity	=	the five-year average foreign pretax income scaled by the five-year average pretax income for firm *i*; and
Industry	=	a dummy variable (set one to 49) for firm *i*'s industry as defined in Fama and French (1997) and updated on Ken French's website as of June 8, 2005.

TABLE 5
Probit Regression Results for Industry-Adjusted Return on Equity

Variable (Expected Sign)	Coefficient (Std. Err.)
Cash_ETR (-)	-0.690***
	(0.260)
ROA (+)	15.710***
	(0.604)
Capital_Intensity (?)	0.475**
	(0.188)
Inventory_Intensity (?)	-1.553***
	(0.428)
R&D_Intensity (?)	-5.192***
	(1.447)
Advertising_Intensity (?)	-7.705***
	(1.986)
Industry (?)	0.006
	(0.005)
Intercept (?)	-4.418***
	(0.245)
Observations	16,881
Log-likelihood value	-3,755
Pseudo *R*-squared	0.1339

*, **, *** Significance at the ten percent, five percent, and one percent levels, respectively, using one-tailed tests for coefficients with a predicted sign and two-tailed tests for all other coefficients.

Variable Definitions:

Industry-Adjusted ROE = a dummy variable set equal to one if firm *i*'s five-year average return on equity is in the top ten percent of all sample firms within its industry in the five-year period, set equal to zero otherwise. Industry membership is determined by the industry reported in the fifth year using the 49 industry classifications as defined in Fama and French (1997) and updated on Ken French's website as of June 8, 2005. Our sample consists of 34 industries;

Other Variables = Same as in Table 4

TABLE 6

Probit Regression Results for Alternate Proxies of Tax Management

	Panel A: *Book_ETR*		Panel B: *Current_ETR*		Panel C: *MTR*
Dependent Variable:	*ROE*	*Tobin's q*	*ROE*	*Tobin's q*	*ROE*
Variable (Expected Sign)	Coefficient (Std. Err.)	Coefficient (Std. Err.)	Coefficient (Std. Err.)	Coefficient (Std. Err.)	Coefficient (Std. Err.)
Book_ETR	-5.025***	-1.433*			
(-)	(0.513)	(0.906)			
Current_ETR			-2.084***	-2.527***	
(-)			(0.426)	(0.750)	
MTR					-5.473***
(-)					(1.838)
ROA	24.286***	34.797***	25.045***	36.286***	25.530***
(+)	(0.799)	(1.409)	(0.883)	(1.627)	(1.092)
Leverage	4.058***	0.155	3.889***	-0.236	5.285***
(+)	(0.275)	(0.454)	(0.307)	(0.500)	(0.412)
Size	0.192***	-0.196***	0.275***	-0.094	0.204***
(?)	(0.039)	(0.059)	(0.042)	(0.063)	(0.051)
Capital_Intensity	-0.659***	0.399	-0.868***	0.162	-0.489
(?)	(0.233)	(0.397)	(0.255)	(0.431)	(0.338)
Inventory_Intensity	-0.365	-3.435***	-0.366	-3.853***	-0.167
(?)	(0.455)	(0.714)	(0.503)	(0.856)	(0.614)
R&D_Intensity	-4.845**	20.510***	-3.277*	20.880***	-1.143
(?)	(1.608)	(2.010)	(1.709)	(2.216)	(2.055)
Advertising_Intensity	1.987	4.056*	1.511	4.565*	1.861
(?)	(1.839)	(2.381)	(1.938)	(2.512)	(2.277)
Foreign_Intensity	0.123	-0.124	0.195	-0.377	0.323
(?)	(0.227)	(0.338)	(0.255)	(0.382)	(0.282)
Industry	0.001	0.010	0.000	0.009	-0.010*
(?)	(0.005)	(0.007)	(0.005)	(0.008)	(0.006)
Intercept (?)	-6.510***	-8.037***	-8.214***	-8.547***	-6.825***
	(0.452)	(0.724)	(0.482)	(0.739)	(0.819)
Observations	18,310	18,321	15,345	15,345	9,969
Log-likelihood value	-2,677	-1,710	-2,246	-1,499	-1,493
Pseudo *R*-squared	0.2837	0.4243	0.3991	0.4997	0.2487

*, **, *** Significance at the ten percent, five percent, and one percent levels, respectively, using one-tailed tests for coefficients with a predicted sign and two-tailed tests for all other coefficients.

Variable Definitions:

Book_ETR = the five-year average of total tax expense scaled by the five-year average of pretax income for firm *i*;

Current_ETR = the five-year average of the current portion of the sum of federal, foreign and state income tax expense scaled by the five-year average of pretax income less special items for firm *i*;

MTR = the five-year average of the marginal tax rates determined using the simulations described in Gram *et al.* (2004) for firm *i*;

Other variables = same as in Table 4