Taxes and Leverage at Multinational Corporations

By

Michael Faulkender[a] and Jason Smith[b]

Abstract:

Empirical research has struggled to document the variation in recent corporate capital structures as arising from variation in estimated corporate income tax rates. We argue that in previous studies, both the tax rates applied to multinational corporations and the taxable income earned has been mismeasured, a result of firms operating in many foreign countries. Using a sample of multinational firms collected in the Bureau of Economic Analysis' annual survey combined with each firm's respective income and country specific tax rate, we revisit this tax-leverage puzzle. Empirically we find that firms do have higher leverage ratios and lower interest coverage ratios when they operate in countries with higher tax rates, as theory would suggest. Our results demonstrate that the primary benefit of leverage under the trade-off theory of capital structure continues to have empirical support.

Note: The statistical analysis of firm-level data on U.S. multinational companies was conducted at the Bureau of Economic Analysis, U.S. Department of Commerce, under arrangements that maintain legal confidentiality requirements. The views expressed in the paper are those of the authors and do not reflect official positions of the U.S. Department of Commerce.

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[a]Robert H. Smith School of Business, University of Maryland, College Park, MD 20742. Email: mfaulken@rhsmith.umd.edu. Phone: 301-405-1064

[b]Huntsman School of Business, Utah State University, Logan, UT 84322. Email: jason.smith@usu.edu. Phone: 435-797-2363

I. Introduction

The trade-off theory of capital structure postulates that firms trade-off the benefits of raising external capital from debt holders against the costs of having such fixed obligations. The primary benefit of issuing debt is hypothesized to arise from the fact that interest paid to debt-holders is deducted before corporate income taxes are calculated whereas payments to equity holders do not receive a tax deduction. The reduction in taxes is considered a wealth transfer to investors from the government arising entirely from the capital structure choice of the firm. For a debt issuance that is anticipated to be perpetually rolled over, the value of that wealth transfer is approximately the amount of the debt issuance multiplied by the corporate income tax rate. For a country like the United States with a relatively high corporate income tax rate (a statutory federal rate of 35%), theory argues that firms in this country should have significant leverage. Yet when finance researchers attempt to empirically estimate the size of this benefit and whether variation in corporate capital structures is explained by variation in the tax status of corporations, the results have been less conclusive than theory would predict.

We argue that one reason empirical researchers may have failed to find significant effects is because consolidated financial statements that are publicly disclosed make it difficult to ascertain how much of the income is earned in which tax jurisdiction. Previous research has implicitly assumed that all of the firm's income is either earned in the United States or if earned overseas, that the funds are contemporaneously repatriated to the United States (Graham (1996a) as an example among many). Either way, it generates the assumption that the US tax code is the binding tax structure when estimating the benefits of leverage. However, significant evidence has emerged that much of the observed increase in corporate liquidity over the last couple decades can be explained by the tax differential between the tax jurisdictions of US foreign affiliates and

the US (Foley, Hartzell, Titman, and Twite (2007)). This arises due to the fact that the corporate income tax rate in the United States (35% at the federal level) has been one of the highest among OECD nations during our sample period. Ireland has operated since 2003 with a corporate income tax rate of just 12.5%. By retaining earnings in the foreign affiliate, and thus deferring the payment of US taxes, firms have significantly decreased their tax liabilities.

For example, a United States Senate committee recently investigated the tax status of Apple, Inc. and found that it had structured its foreign operations in a way that enabled it to almost entirely eliminate its contemporaneous corporate income tax obligation (McCoy (2013)). This retention of earnings in the foreign affiliates will reduce the benefits of adding leverage to the capital structure of the firm since the effective tax rate confronting the foreign earnings of the firm will, at least contemporaneously, be significantly lower than the rate they would pay in the United States, close to zero in the case of Apple. If companies like Apple retain the income in their foreign subsidiaries until another repatriation tax holiday is enacted or until corporate income tax reform with significantly lower tax rates becomes law, previous estimates of the corporate tax rate confronting US multinationals are significantly over-estimated.

Multinational firms have become increasingly important through time. During our sample period, the percentage of profits earned within the foreign operations of US multinationals has increased from 13% to 25%. Although multinational firms only represent 10% of all firms, they comprise approximately one third of the assets and profits of publicly traded US firms, excluding financials and utilities.

The objective of our study is to estimate how much variation in tax structure arising from global operations explains the variation in capital structure that we observe among US publicly

traded multinational firms. Do multinationals with significant earnings in low-tax jurisdictions rely significantly less on debt in their capital structure than otherwise equivalent firms that are mostly based in the United States? By how much does the locating of operations in low tax jurisdictions alter corporate financial structure? Given the significant size of this subsample of firms, understanding how these firms determine their capital structure furthers our understanding of the aggregate capital structure activities of US firms.

Unfortunately, data restrictions have made answering this question difficult because firms' required public disclosures do not offer sufficient information to identify the tax jurisdiction where profits have been generated. While foreign sales are a widely populated disclosure item in firms' 10-K filings, the incomes of such foreign operations are not nearly as available. Additionally, the disclosed location is often so generic that it does not allow a specific identification of the tax jurisdiction (e.g. a disclosure of a European operation does not indicate how much revenue is generated in which specific European country). The Bureau of Economic Analysis (BEA) conducts a mandatory survey of U.S. multinational companies that generates the data that is needed to address these data shortcomings.[1] Cleaner data on the income and location of multinational affiliates enables significantly more reliable estimates of the true tax rates such firms confront and thereby provides for much stronger tests of the tax benefits of debt in explaining the observed variation in firm capital structures. We employ the BEA's multinational firm data and augment it with international tax data which contains both statutory rates as well as progressive tax schedules where applicable.

[1] The company-level data from this survey, which by law are confidential, are collected for the purpose of producing publically available aggregate statistics on the operations of multinational companies.

Since theory argues that financial decisions are driven by marginal rates, having tax rate estimates that are closer to the true marginal rates that firms contemporaneously confront, accounting for their international operations, increases the precision of our work. Using our calculated weighted average tax rate, we include otherwise identified explanatory variables for capital structure and estimate in a multivariate regression setting how much our blended tax rate measure improves our understanding of why capital structure varies across firms and, to a lesser extent, across time.

Consistent with the trade-off theory, variation in corporate tax rates significantly explains observed variation in the capital structure of multinationals. Over the time period for which we have data on multinational operations and tax rates, we find that firms that realize most of their income in low tax jurisdictions have corporate leverage ratios that are significantly lower, and interest coverage ratios that are significantly higher, than otherwise similar firms whose earnings are primarily derived in high corporate income tax jurisdictions. These results are robust to incorporating cash into our leverage measures. The results of this paper indicate that taxes do indeed have a first order effect on corporate leverage decisions.

Before proceeding, it is important to address the issue of endogeneity. Our results document a correlation between high marginal tax rates and significantly greater use of leverage. If the tax status of the firm were exogenous, our results would appropriately be interpreted as the variation in tax structure *causing* firms to vary their capital structure, as theorized. Even if firm location is endogenous, if firms first determined where their operations are located and then second determined capital structure, again it would be appropriate to interpret our results as the variation in tax structure *causing* firms to vary their capital structure. However, firms may choose where to locate their operations and their leverage simultaneously. If that is the case, our

findings are no longer *causal*. For instance, firms with low financial distress costs may choose to be less sensitive to the tax rates of the particular location of their operations (making such firms tax rates higher on average) because they can shield their income with interest expense arising from debt. Those firms with high distress costs are more selective in where they operate (lower corporate tax rates on average) because it is significantly more costly to use debt to shield their income from taxation than to alter the location of their operations. In this case, firms trade-off the tax benefits of the locations of their operations with the tax benefits of leverage. This interpretation is still consistent with debt as an instrument (potentially among many) to create firm value by reducing its corporate income taxes; whether firms use it depends upon the cost of locating its operations in particular tax jurisdictions relative to the financial distress costs of using debt. This interpretation is consistent with thinking of international operations as a non-debt tax shield and is still consistent with firms incorporating the effects of taxation into their capital structure decision, consistent with the trade-off theory.

The remainder of this paper is structured as follows. Section II contains a brief review of the relevant literature on capital structure and international operations. Section III explains the empirical methodology and data used to estimate whether variation in foreign operations affects how firms structure their external capital. Section IV describes our results. Finally, Section V concludes.

II. Literature Review

Capital structure research is focused broadly on two traditional views: the trade-off theory where a firm balances the costs and benefits of debt to yield an optimal leverage ratio and the pecking order theory of Myers (1984) which minimizes the adverse selection costs associated with security issuance. Graham and Leary (2011) provide a thorough review of the capital

structure literature. Much empirical work on the trade-off theory has focused on explaining debt levels and adjustment toward a target leverage ratio (e.g. Leary and Roberts (2005), Flannery and Rangan (2006), Lemmon, Roberts, and Zender (2008), and Frank and Goyal (2009)). Although there appears to be consensus (Welch (2004) being a notable exception) that firms do have a leverage target, adjustment toward that target appears to be very slow. Faulkender, Flannery, Hankins, and Smith (2012) show that for firm-years with low adjustment costs, because their earnings or investments already require accessing the capital markets, firms will move relatively quickly toward target leverage.

One of the theoretical first order explanations for variation in leverage arises from the differential treatment of debt and equity for corporate tax purposes. As the corporate tax rate increases, using debt to eliminate the corporate income tax that would otherwise be paid on the proceeds of the firms operations becomes more valuable. One of the challenges for researchers is that within a country in a particular year, the corporate tax rate is the same for all firms, hence minimal cross-sectional variation. There is still some variation in expected tax rates due to tax loss carry-forwards arising from operating losses potentially delaying tax benefits from leverage. Graham (1996a) estimates such rates and finds evidence of higher marginal tax rate firms using more debt, but it doesn't appear to be a first order concern. Graham (1996b) further demonstrates that simulated tax rates are the best proxy for the "true" marginal tax rate. Blouin, Core, and Guay (2010) similarly estimate tax rates making different assumptions about earnings growth and therefore what marginal tax rates firms are confronting. They find that their tax rate measures better explain variation in leverage *changes* than the estimates of Graham (1996a), particularly for firms who only operate in the US. However, the literature still struggles to explain the *levels* of observed leverage as a function of what theory suggests should be a first-

order factor: the tax differential of debt versus equity. In light of the 35% corporate income tax rate in the U.S. at the federal level and the relatively low estimates of financial distress costs for the average firm, a puzzle exists as to why firms consistently carry lower than anticipated levels of debt given the significant benefits that theoretically arise from using debt to shield income from corporate taxes.

Both Graham (1996a) and Blouin, Core, and Guay (2010) calculate marginal tax rates assuming that the firm is choosing debt levels based on the tax implications arising from long-term earnings fluctuations. Our paper makes a different assumption. We instead hypothesize that multinational firms are making capital structure decisions based on short-term tax implications while they wait for a repatriation tax holiday or reform of the U.S. corporate income tax code, which would include lower corporate income tax rates. A firm considering primarily short-term tax implications should, to the extent that it can, realize earnings in low tax jurisdictions and not focus on the marginal tax rate faced if and when the firm repatriates the earnings back to the U.S. If a firm is making decisions based on long-term earnings fluctuations, as in Graham (1996a) and Blouin, Core, and Guay (2010), we should find our rates irrelevant in explaining a multinational firm's debt level. On the other hand, if a firm is primarily focusing on the short-term tax implications and expecting to repatriate later at a lower rate, then our effective tax rate should better explain observed variation in current leverage. Our empirical tests can be viewed as a test of which of these approaches multinational firms are using with regard to their capital structure decisions.

Faulkender and Petersen (2012), among others, discuss the tax considerations firms make when determining whether to keep earnings in their foreign subsidiaries versus repatriating them immediately. Essentially, the US tax code treats symmetrically the earnings of domestic and

foreign operations when the foreign earnings are repatriated in the same year that they are earned. The US tax code grosses up the amount of the earnings repatriated to the domestic parent by the foreign tax rate to arrive at the original operating earnings value and then applies the US tax rate less a credit for taxes paid by the foreign affiliate on those earnings. As Faulkender and Petersen (2012) explain, taxes are the same in those cases. However, because the US tax liability arises when the earnings are repatriated, not when they are earned, a significant deferral benefit is realized when those earnings are left in the foreign subsidiary. For a firm that anticipates permanently retaining those earnings in its foreign subsidiary, the US tax code is irrelevant; it is the foreign tax rate that is binding on those earnings.

We test whether firms with significant foreign operations in low tax jurisdictions (and whose effective marginal tax rate has been overestimated by previous work) carry significantly less total corporate debt than firms that primarily operate in high tax jurisdictions. Such a finding would demonstrate the first order nature of corporate taxes in the capital structure decisions of firms, contrary to most of the existing literature. Foley, Hartzell, Titman, and Twite (2007) find that firms will increase or decrease cash holdings in foreign affiliates, and thus their overall cash level, depending on the tax burden from repatriating foreign income. This paper uses similar data to explain firm debt levels after accounting for the relevant tax implications of foreign earnings.

Several papers have made use of firm-level data on U.S. multinational companies within the Bureau of Economic Analysis. The closest paper to ours is Desai, Foley, and Hines (2004), which find that the local tax rate does affect the capital structure of the affiliates. We abstract from the location of the debt (it should be issued by the U.S. parent or its high tax rate foreign subsidiaries), and are instead interested in the total debt of the firm. We are less focused on whether high tax jurisdiction affiliates are lending to low tax jurisdiction affiliates, the effects of

which would cancel out when aggregated. Antras, Desai, and Foley (2009) use the direct or indirect ownership or control by a single U.S. legal entity as a direct investment to analyze costly financial contracting and weak investor protection influence across borders. Desai, Foley, and Forbes (2008) use multinational firm data to analyze how financial constraints and product market exposures determine the response to sharp depreciations. Desai, Foley, and Hines (2011) analyze the extent to which tax deferral and other policies inefficiently subsidize U.S. direct investment abroad.

Other work has examined within country relationships between corporate leverage behavior and changes in tax rates. Heider and Ljungqvist (2014) examine state level changes in corporate income tax rates and find that leverage ratios rise following increases in the firm's home state corporate income tax rate, but that leverage ratios do not decline following state corporate income tax rate reductions. Doidge and Dyck (2014) examine the reaction to a 2006 surprise announcement resulting in higher corporate income taxes on Canadian firms. Subsequent to the announcement, the firms more impacted by the corporate income tax change had comparatively higher leverage ratios than the control firms.

A large literature also exists that recognizes alternative ways for firms to shield income from corporate income taxes. Graham and Tucker (2006) examine leases, transfer pricing, cross-border dividend capture amongst others and document that during the sample tax shelters amounted to 9% of asset value. Graham et al. (2004) show that debt policy at Standard & Poors 100 and Nasdaq 100 firms is better explained if taxable income is adjusted for deductible employee stock option exercise. Desai (2003) argues that there are new "enhanced opportunities for avoiding and evading taxes through cheaper, more sophisticated, and less transparent mechanisms." Other tax shelter investigations include Clausing (2003), Bartelsman and Beetsma

(2003), and Hines (1997). This literature informs our understanding of how firms shelter income from taxation and the purpose of this paper is to relate tax sheltering activities via delayed earnings repatriation to the amount of total debt the firm adopts.

We expect that our tax rate estimates will be substantially different than those estimated when assuming that all operating income is contemporaneously repatriated. If highly profitable firms are the ones most likely to locate operations in low tax jurisdiction countries (they would realize the greatest benefits from incurring the costs of locating operations overseas), assuming that the US tax code is binding for them will generate significantly higher estimated tax rates under the Graham (1996a) and Blouin, Core, and Guay (2010) approaches. These are the firm-years for which we would potentially find rather low tax rates using international data. If the benefits of moving operations overseas decline as marginal tax rates decline, then the Graham (1996a) and Blouin, Core, and Guay (2010) methods will be more accurate. This type of selection bias in the decision to have significant operations in foreign affiliates will generate a zero if not negative correlation between our rates and those used in these previous studies.[2]

III. Empirical Methodology and Data

Our objective is to better understand the variation in leverage ratios observed in the data. Recent work (e.g. Lemmon, Roberts, and Zender (2008)) points to a significant firm-specific, time-invariant component that explains leverage that is currently absent from standard empirical specifications. Recognize that such a characteristic could be a factor not yet identified by the literature or alternatively, an already determined factor that is persistently misestimated. In this

[2] The correlation between our estimated rates and Graham (1996a) and Blouin, Core, and Guay (2010) are 0.050 and 0.102 respectively. For industries with a significant percentage of overseas operations, like Pharmaceuticals, the correlations are negative.

study, we argue that the locations and tax implications of firms' international operations are a persistent, firm-specific characteristic that theory has identified as a factor that could explain leverage, but that previous examinations have not precisely measured.[3] The Bureau of Economic Analysis (BEA) conducts an annual survey that US multinationals are required by law to complete that contains numerous balance sheet and income statement items for each foreign affiliate of a US-based multinational firm. We use the BEA multinational affiliate data to better measure the variation in the tax differential between debt and equity. Does this measure significantly improve our ability to explain the observed variation in leverage ratios, in particular the firm-specific, time-invariant component?

We specifically employ data from the BEA's benchmark (BE-10) and annual surveys (BE-11) of U.S. multinational companies, which include information on the profitability of the various foreign affiliates of multinational firms.[4] Because we are interested in the effects of a multinational firm's variation in taxes on leverage, our firm observations are limited to those multinationals who participate in the BEA surveys – we do not have any purely domestic firm-years in our panel. This data is available from 1994 to 2009. These locations and amounts create the weights that we use in generating our weighted average tax rate variable as well as inform us of the tax rate to use for that affiliate.

Tax code information for foreign jurisdictions was provided by Comtax for the years 2006 to 2012. For the period 1995 to 2005, we utilize data from the KPMG Corporate and

[3] Because the location of firm earnings is highly autocorrelated, we expect that the effect will be persistent for a given firm and that the effect will be largely cross-sectional.

[4] The benchmark (BE-10) survey, conducted every five years (1994, 1999, 2004, and 2009), is more comprehensive for some of the accounting data of the smaller foreign subsidiaries than the annual (BE-11) survey, which is conducted in interim years. The BEA estimates these accounting items for the intervening four years between the comprehensive surveys. Our results are robust to confining our analysis to only the years in which the more comprehensive survey is conducted.

Indirect Tax Survey. Thus the overlap in the BEA data and tax data is our sample period: 1995 to 2009. The KPMG data does not cover many of the smaller countries that Comtax data covers so for those missing observations, we searched for alternative data sources and augmented the data where possible. If we were unable to locate tax rates for foreign jurisdictions prior to 2006, we assume that the tax rates for that period in those countries are the same as they were in 2006.[5] Alternatively, we could estimate the implied tax rate using the ratio of taxes paid divided by pre-tax income. The downside of such an approach is that many tax systems are progressive so the average rate (which is derived from this quotient) will tend to under-estimate the marginal rate, i.e. the rate on which financial decisions are theoretically made. Following Desai, Foley, and Hines (2001), we estimate effective tax rates at the country year level from the BEA data and use the median effective rate for each country in each year to alternatively estimate our weighted average effective tax rate. The results are very similar economically, although with reduced statistical significance.

Recognize that we do assume that firms pay the tax rate associated with a particular foreign tax jurisdiction. According to the United States Senate committee report, Apple structured their Ireland operations in a way that avoided both US and Irish taxes. For all firm-years in our sample, we assume that the Irish operations of a firm were subject to the 12.5% tax rate applicable in Ireland, and the same for all other countries in the sample. Should tax structures such as that identified in the Senate report for Apple be significant over our sample period, our weighted average rate rates will over-estimate true tax rates firms are facing.[6]

[5] Note that if the error with that assumption is random, the mismeasurement would serve to underestimate our coefficient of interest.

[6] This measurement error would lead to an under-estimation of the variation in corporate income tax rates. We acknowledge that such measurement error could cause us to over-estimate the true economic effects arising from cross-sectional variation in tax exposures.

The measure that we have constructed is a weighted average tax rate using the percentage of EBIT (earnings before interest and taxes) generated in each affiliate in that fiscal year with the tax rate in the tax jurisdiction of that affiliate. So if 50% of the total operating income in 2006 were generated in the United States, 30% in foreign affiliate A which is located in Ireland, and the remaining 20% in affiliate B which is located in Germany, we would form the true tax rate confronting the firm in 2006 by taking the weighted average:

$$\tau_{Firm,2006} = 50\%\tau_{US} + 30\%\tau_{Ireland} + 20\%\tau_{Germany}$$

This blended tax rate represents our estimate of the tax rate confronting firms prior to using interest expense to shield such income from taxation. As this weighted average rate increases, we would expect the firm to use even more debt to shield income from that average tax rate.

The question naturally emerges as to the appropriate tax rate to use for the US portion of the taxable income. Significant work has been done for the United States on this question and many of these examiners have made their estimates available to researchers. For instance, the estimates of Graham (1996a) are available from John Graham's web page. The estimates of Blouin, Core, and Guay (2010) are available on WRDS. However, in both cases, these estimates assume that all of the earnings were contemporaneously taxable in the United States and therefore most likely overestimate the true tax rate confronting the US operations. We instead employ the progressive marginal rate for just the US operations.

We calculate firm-country-year taxable income by combining all affiliates located in a particular tax jurisdiction and then use the net income within that firm-country-year adding back foreign taxes, interest expense, and "other expenses" (which the BEA survey classifies as minority interest). In cases where the earnings of the foreign affiliates are negative, we assign

zero weight to that affiliate for that firm-year (i.e. we do not allow negative weights). Because the survey only contains foreign operations and consolidated firm data, we assume that US-generated taxable income is equal to the firm's total net income plus US taxes plus foreign taxes plus interest paid less the total pre-tax earnings of all of the foreign operations. Recall that capital structure decisions are theoretically based on pre-income tax and pre-interest expense income which is why both of these items are added back to net income in order to arrive at our estimates of both foreign subsidiary and US operating income. If our estimate of US operations is negative, we again assign zero weight to the US tax rate in estimating our weighted average.

We add these estimated tax rates to an otherwise standard regression specification for leverage that incorporates variables that have been widely used in the literature (see for instance Frank and Goyal (2009), Faulkender and Petersen (2006), and Lemmon, Roberts, and Zender (2008)). For our dependent variables of interest and the rest of our control variables, we rely upon the COMPUSTAT data that is provided by Standard and Poor's based upon annual 10-K filings. We examine a variety of leverage measures. The book leverage ratio is defined as the sum of short-term and long-term debt divided by the sum of short-term debt, long-term debt, and the book value of shareholders equity. By instead dividing total debt by the value of debt plus the firm's equity market capitalization, we arrive at the market leverage ratio. Additionally, we calculate the net book leverage ratio and net market leverage ratio as above but instead use debt minus cash in the numerator. Note that this variable therefore can take on negative values should the firm have more cash than interest bearing debt (which is the case for 30% of the firm-year observations in our sample). All of these measures are winsorized at the 1st and 99th percentiles. In addition, we follow Faulkender and Petersen (2006) and employ the natural log of one plus

the interest coverage ratio, defined as EBITDA divided by interest expense, to get a sense of the annual cash flow obligations of the firm relative to the scale of its earnings.

Control variables are from COMPUTSTAT and include: firm size as measured by the natural logarithm of sales, profitability as measured by EBIT over book assets, asset tangibility proxied for by the ratio of PP&E to book assets, growth opportunities as measured by the ratio of R&D to sales, advertising to sales, and the market-to-book ratio, the depreciation to assets ratio in order to capture depreciation tax shields, and whether the firm has a bond rating any month during the fiscal year. Observations included in our regressions must have non-missing observations for all of these variables plus have our blended tax rate, Graham (1996a) tax rates available from John Graham's website as well as tax rates on WRDS using the Blouin, Core, and Guay (2010) estimation methodology. Since our objective is to demonstrate the difference in estimates from these different tax measures across a common sample, we require data to be available for all three measures.

The firms that we examine are larger and more profitable than the average COMPUSTAT firm, an expected result given that we only examine multinational firms in the BEA dataset. The summary statistics are located in Table 1. In the first column, we provide statistics on the firms in the COMPUSTAT dataset over the 1995 to 2009 time period for which all relevant variables are non-missing. The second column contains the subset of firm-years for which the firm does not appear in the BEA sample while the third column contains the BEA dataset observations.[7] Comparing the means and medians of the firms that are in our analysis (column 3) and those that are not (column 2), we see that our multinational firms are larger and

[7] In order to protect the identities of BEA firms, all median results listed in the third column are actually calculated using the mean of the inner nine observations.

more profitable but most of the capital structure measures as well as many of the control variables have similar means and medians. Looking at the tax rates that are estimated by Graham (1996a) and Blouin, Core, and Guay (2010), the firm-years for which BEA has information on multinational operations has higher estimated tax rates than those firms that are purely domestic. Interestingly, our estimated tax rate is, on average, higher than the tax rate estimates of the other two methods but our median tax rate is lower.

To further motivate our results, Table 2 provides information at the 2-digit SIC code level regarding the international percentage of the operations in that industry, the leverage ratios observed in that industry, and the three tax rate estimates. Specifically, we calculate the portion of total industry earnings among the firms in our sample that are generated in the United States versus the rest of the world. The five industries with the smallest percentage of their earnings generated during the sample period in the United States appear in the top half of the panel, conditional on the industry having at least one hundred firm-year observations in our sample; the five industries with the highest portion of their earnings generated in the United States are in the bottom half. Perhaps not surprising, all five of the industries with significant foreign operations are classified as manufacturing industries. In contrast, the industries that are almost entirely domestic are (perhaps not surprisingly) retail, printing, communications, and health care.

Also included in Table 2 are estimates of leverage and implied tax rates for these 2-digit SIC code industries. We calculate the weighted average leverage and tax rates for each industry, with the weights coming from the portion of industry earnings associated with that particular firm-year as a percentage of the total for that industry during our sample period.[8] The leverage

[8] By weighting by earnings, we are examining the leverage ratio of the average dollar of earnings in that industry subject to tax as well as the tax rate the average dollar of earnings in the industry would be subject to.

differences are striking. The earnings-weighted average book leverage ratio for the five industries that have significant overseas operations is 15.5% lower than the average across the five industries that are primarily US based. Similarly, the estimated tax rate under our weighted average tax measure is 4.8% lower for firms that have significant overseas operations relative to almost no difference under the Blouin, Core, and Guay (2010) estimate and only a 2.1% difference using the Graham (1996) estimates. These industry level statistics are consistent with our hypothesis that significant overseas operations generates lower effective tax rates for multinational firms and that lower effective tax rates should correspond to lower observed leverage ratios.

A more robust testing of theory requires employing a multivariate regression framework. Econometrically, we estimate OLS regressions without firm fixed effects despite the considerable explanatory power they have been demonstrated to provide (Lemmon, Roberts, and Zender (2008)). Variation in international operations is highly autocorrelated. Therefore the fixed effects would span much of the variation in corporate income tax rates, greatly reducing its estimated contribution and instead assign much of the explanatory power to the fixed effects. Instead, we employ year dummies and cluster the standard errors at the firm level to capture the lack of independence among the residuals for a given firm across years (Petersen, 2009).

For all specifications, we also estimate between regressions. Since the location of foreign operations is largely firm-specific and time invariant, most of the variation in our regressions should be coming from cross-sectional differences and not from time variation for a given firm. Since between regressions are estimates of the average dependent variable on the averages of the independent variables at the firm level, these specifications will focus entirely on the cross-sectional variation in leverage resulting from cross-sectional variation in estimated tax rates.

These specifications do not include year effects since the estimates are on averages across time so any time series effects would come from the unbalanced nature of the panel, not due to variation over time in the average costs and benefits of leverage for all firms.

Theory suggests that the larger the implied tax rate confronting the firm, the more that the tax deductibility of interest (but not payments to equity holders) would incentivize firms to adopt higher leverage ratios. Therefore, our null hypothesis of no effect of the variation in tax rates on variation of leverage is hypothesized to be rejected in favor of a positive relationship between the two. Since interest coverage is higher for firms with smaller obligatory interest payments, we hypothesize a negative relationship between our weighted average tax variable and interest coverage.

IV. Results

This section shows that leverage ratios are significantly higher when firms have high contemporaneous international tax exposures. We present the results of regressions containing our weighted average measure and compare them to the regression results arrived at using both the Graham (1996a) estimated tax rates and the Blouin, Core, and Guay (2010) estimates. As Blouin, Core, and Guay (2010) state, they expect their tax rates to be mismeasured for firms with significant overseas operations and find that their estimates have less explanatory power when examining multinationals relative to purely domestic firms. The contribution of our paper is that we demonstrate that when we employ a blended tax rate that takes into account the variation in the tax rates and scale of multinational operations, we greatly improve our understanding of capital structure for multinationals.

Leverage Ratios

Before proceeding to those results, we first provide a baseline specification of book leverage regressed on the standard set of controls used in numerous previous studies recognizing that the relationships may be different for a panel of only multinationals over this more truncated sample period (1995 to 2009). The results of this regression are located in column I of Table 3. Consistent with previous studies, rated firms, those with higher asset tangibility, and those with lower earnings have higher leverage ratios. Somewhat at odds with prior studies, firms engaged in more advertising and with higher market-to-book ratios, proxies generally interpreted as capturing cross-sectional variation in financial distress costs, have higher leverage ratios. Previous examinations on data sets containing both domestic and multinational firms have generally found that growth opportunities are negatively associated with leverage whereas we estimate a positive relationship.

Moving to the effects of taxes, we begin by adding the Graham (1996a) estimated tax rates to our baseline specification in column II of Table 3 and the Blouin, Core, and Guay (2010) estimates in column III. In both of these specifications, a coefficient that is negative and statistically significant is estimated. This is the opposite of what theory argues. Under these two measures of marginal tax rates, the results actually suggest that it is firms with low marginal tax rates that rely more heavily upon debt. Recall that we are only examining multinationals over a different time period than those studies examined, the likely source of the differences in results.[9] Recall that Graham (1996a) and Blouin, Core, and Guay (2010) are incorporating carrying forward and backward features of the tax code. Since multinational firms are generally larger and more profitable than an average purely domestic firm, these firms marginal tax rates under

[9] Hovakimian, Kayhan, and Titman (2012) also document a negative relationship between marginal tax rates and debt ratios when using Graham (1996a) rates and argue that these results appear to be "quite robust with respect to various leverage definitions, subsamples, and the inclusion/exclusion of various variables in the regression specification."

their measures will be the largest. Yet, these are precisely the firms that we argue are most likely to shelter income in low tax jurisdiction foreign operations.

The shortcoming of both of these measures for multinational firms is the implicit assumption that foreign profits are contemporaneously repatriated making the US tax code the binding tax rate structure. However, as explained above, when firms retain the earnings in their foreign affiliates, potentially in perpetuity (or in anticipation of the US eventually moving to a territorial tax system or enactment of another repatriation tax holiday), it is the contemporaneous tax rate of the tax jurisdiction in which those operations are located that is relevant. Since we are only examining the capital structures of multinationals, we substitute the US-based estimates of the corporate tax rate with our weighted average effective tax rate. The results of this regression are located in column IV of Table 3.

Firms with higher estimated tax rate obligations appear to shelter more of their income from taxation by employing leverage. Our effective tax rate measure has a standard deviation of 4.9% so a two standard deviation increase in the tax rate confronting a firm is a change of approximately ten percent. Looking at the estimated coefficient on our weighted-average tax measure, we see that firms with operations located in low tax jurisdictions that generate an estimated tax rate ten percent lower than an otherwise equivalent firm (25% instead of 35% for example) have less debt equivalent to 2.7% of the book value of the firms debt plus equity. Relative to an average book leverage ratio of 30.4%, this reduction in leverage is economically significant, in addition to the coefficient being statistically significant at better than one percent. Using the average of all other control variables, the estimated leverage ratio of firms confronting a 35% weighted average tax rate would be 35.7% (56^{th} percentile of the distribution of book

leverage) and this falls to 33% for an otherwise equivalent firm confronting just a 25% average tax rate, placing it in the 52nd percentile of the book leverage distribution.

An alternative econometric specification that focuses solely on the cross-sectional variation is to employ a between regression which regresses the firm's average book leverage ratio on the firm's average independent variables across the sample period. Since firms are unlikely to be moving operations annually with minor fluctuations in tax rates, the effect is expected to primarily be cross-sectional. Thus, a between estimate is appropriate for such a setting. The results of such specifications are located in columns V to VIII of Table 3.

Comparing the baseline specification in column I to the baseline specification in column V, we see that the results are rather similar in both sign and magnitude. This would indicate that the cross-sectional (between) and time-series (within) coefficients are rather similar to each other for these variables. The exceptions appear to be the market-to-book ratio and the depreciation expense coefficients, both of which more than double in the between effects specification. The increases in these coefficient estimates are consistent with these characteristics being more important in the cross-section than the within firm time series. In other words, firms' capital structure does vary across firms due to persistent differences across firms in these characteristics but firms do not appear to adjust leverage ratios with annual variation in these measures.

Moving to the tax rate estimates and similar to the OLS results, the tax variables estimated by Graham (2006) and Blouin, Core, and Guay (2010) estimate negative effects between the average book leverage ratio and the firm-specific average estimated tax rate. Contrast that with our weighted average tax rate which in column VIII takes on a significantly positive coefficient of 0.711, and estimate that is statistically significant at better than one

percent. Economically, this coefficient corresponds to a 7.1% higher book leverage ratio for a firm with a 35% average tax rate over the sample period compared to an otherwise identical firm with a 25% average tax rate. Based on these estimates, such a change in leverage is equivalent to a firm with sample averages of the other firm characteristics moving from the 48th to the 42nd percentile of the book leverage distribution. These results demonstrate that, contrary to some of the earlier literature finding that tax effects were negligible, firms that persistently confront high tax rates have significantly more debt, both economically and statistically, than otherwise equivalent firms who persistently face lower corporate income tax rates.

The results are very similar when we instead examine market leverage. For both the Graham (1996a) measure and the Blouin, Core, and Guay (2010) measure, the signs in the OLS and the between regressions (located in Table 4) are negative and the coefficients are statistically significant at better than one percent. As with book leverage, these coefficients have signs that are opposite what is predicted by theory. However, moving to our internationally weighted tax measure, the coefficient is positive. In the OLS specification, our estimate is not statistically significant but in the between regression, the estimated coefficient is significantly different from zero with better than one percent statistical significance.

Recall that an OLS estimate in a panel regression explains both the cross-sectional and time-series variation in the dependent variable whereas the between regression solely measures cross-sectional variation. Since we expect that firms do not vary the location of their operations significantly over a short time period, the firm-specific variation in the tax measure is likely to be noise. Additionally, our sample period covers the tech bubble and burst as well as the financial crisis, a time period over which market valuations moved significantly even though the benefits

from shielding income from taxation did not change significantly. [10] It is therefore not surprising that when this time-series variation is removed and we focus on the difference in the cross-section (the between regressions), we find a statistically and economically significant effect of variation in tax rates on the market value of leverage. In other words, note that the coefficient itself increased by a factor of five relative to the OLS estimated coefficient. This increase is consistent with the persistent component of capital structure related to the international tax effects of their operations being stronger than the annual variation in what percentage of the income is earned in which tax jurisdiction.

Net Leverage Ratios

The effects that we have documented so far solely examine the extent to which firms include debt in the capital structure in relation to the effective tax rate it confronts. This examination may underestimate the true effect of variation in corporate taxation on firm financial policy. Apple, Inc. announced in 2013 that it will engage in share repurchases funded by debt issuances of the parent company despite its sizable cash position (Burne, 2013). Because the bulk of the cash is "trapped" in its foreign subsidiary and subject to significant repatriation tax, it would be issuing debt to fund repurchases while their foreign operations continue to accumulate cash. If such activity were happening systematically, then despite the additional leverage generating minimal tax reduction, the firm is still taking on debt at the parent company level offset by cash in the foreign subsidiary. For such firms, the net debt ratio would better explain

[10] Even though year fixed effects are included in the OLS specification, they will not entirely remove the variation in leverage ratios arising from volatile equity prices. Consider a firm with zero leverage versus one with an average market leverage ratio of 50%. The equity market volatility will not change the market leverage ratio of the firm with no debt whereas the market leverage ratio of the firm with an average ratio of 50% will observe significant time series variation in leverage. Time fixed effects capturing market volatility will cause residual variation in the leverage ratio of the zero debt firm to move too much whereas the residual variation will be insufficient for the highly levered firm. This will cause the true tax effect to be under-estimated despite the presence of time fixed effects.

variation in leverage because the above regressions only count the firm's debt, they ignore the offsetting cash. We therefore re-estimate our regressions by substituting the difference between debt and cash (plus marketable securities) in the numerator of our two leverage measures. Additionally, leverage measures are naturally truncated at zero whereas net leverage measures can take negative values if cash exceeds debt. Regressions examining net leverage do not confront the issue of a truncated lower bound. The results of net book leverage regressions are located in Table 5 and net market leverage results are located in Table 6.

The results are even stronger when we examine net book leverage. The Graham (2006) tax estimates still generate statistically significant negative coefficient estimates. The Blouin, Core, and Guay (2010) tax estimates generate one negative and one positive coefficient estimate, neither statistically different from zero. Contrast that with our tax measure which retains its positive coefficient estimates with better than one percent statistical significance. More interestingly, the coefficient magnitudes are twice the size of the estimated coefficients in the standard book leverage regressions. Comparing a firm with a 35% effective tax rate to one with a 25% effective tax rate across its international operations, the higher tax rate confronting firm has on average 6.6% of book assets more debt net of cash according to the OLS specification results (a move from the 60^{th} percentile of the net book leverage distribution to the 50^{th} percentile), 14.4% of book assets more debt net of cash in the between regression specification (a move from the 52^{nd} percentile of the distribution to the 39^{th}). Recognize that the average firm in the sample has an amount of debt in excess of its assets equivalent to 14.7% of its assets. For roughly a two standard deviation increase in the tax rate confronting a firm, we find a change in net book leverage equivalent to the mean amount of debt net of cash the firm has relative to its

assets. These results complement Foley et al (2007) since they too found that lower tax rates are associated with more cash, which would make net leverage ratios lower (our finding).

Moving to net market leverage, the results are again similar to what we documented with net book leverage. In the OLS specification, Graham (2006a) estimates are still negative and statistically significant though in the between specification, the coefficient is not statistically different from zero. The Blouin, Core, and Guay (2010) tax measures are positive and statistically significant in the between effects specification. Our coefficient estimates are likewise positive and statistically significant in both specifications. However, our estimates are significantly larger in terms of our economic magnitudes, by a factor of eleven in the OLS specification relative to Blouin, Core, and Guay (2010) and a factor of three in the between effects specification.

Interest Coverage Ratio

An alternative way to estimate capital structure effects is to look at the portion of a firm's annual earnings obligated to interest expense, an income statement approach rather than a balance sheet approach. For high growth firms in particular, they may have high valuations but not yet the earnings to support current interest payments, let alone current earnings that need shielding from taxation. Such an effect may create noise in leverage ratio analysis but be less of an issue in interest coverage regressions. Table 7 provides the results of regressing our measure of interest coverage (the natural log of one plus the interest coverage ratio) on the same set of controls and tax rate variables employed above. The baseline OLS specification results are listed in column I and the baseline between specification results are in column V. Similar to the baseline specifications for leverage, rated firms with greater asset tangibility and lower earnings

have lower interest coverage ratios (more debt). Firms with greater growth opportunities, as measured by R&D, have higher interest coverage ratios, consistent with them wanting to have less of their operating cash flow encumbered by obligatory interest payments that may impede the firm's ability to take advantage of those growth opportunities. Similar to the baseline leverage regressions, we estimate that higher market-to-book ratios and higher advertising expenditures are associated with lower interest coverage ratios for this sample of multinationals, contrary to results obtained for most other samples.

Adding in the Graham (1996a) and Blouin, Core, and Guay (2010) tax variables, we again find that for multinationals over the four year period we examine, firms with higher tax rates have significantly higher interest coverage ratios (less debt). Rather than shielding more of their income from corporate taxation in light of the higher tax rate they would hypothetically confront, they actually have smaller obligatory interest payments relative to the scale of their earnings. For the Graham (1996a) measure (columns II and VI), the estimated coefficient is statistically significant at better than one percent in the opposite direction of what theory would predict. The Blouin, Core, and Guay (2010) measure is statistically significant at better than one percent in the OLS specification (column III) and insignificant in the between regression specification (column VII).

Replacing those tax estimate measures with our weighted average tax variable, we find that firms confronting higher tax rates have significantly lower interest coverage ratios, consistent with theory. When firms would have their income subject to a higher tax rate in the year it is earned, the firm appears to obligate more of those earnings to interest payments, thus shielding more of the income from corporate taxation and arrive at a lower interest coverage ratio. Statistically, our coefficient estimates are significant at better than five percent in the OLS

specification (column IV) and better than one percent in the between specification (column VIII). Economically, a ten percent reduction in the effective tax rate that the firm will confront, given the location and scale of its multinational operations, corresponds to a fifteen percent reduction in the firm's interest coverage ratio in the OLS specification, thirty-one percent in the between specification. Despite the mixed results of previous examinations, our results demonstrate that taxes have the first order relationship with leverage that theory suggests and that forms the basis of the tradeoff theory of capital structure.

V. Conclusion

Our results indicate that variation in tax rates is an important consideration in explaining the cross-sectional variation we observe in leverage ratios. Graham (1996a) identified such effects during the sample period he examined which primarily consisted of the 1970s, 1980s, and early 1990s. More recent research has had difficulty in identifying that relationship, although Blouin, Core, and Guay (2010)'s alternative estimation technique did identify such an effect for largely domestic firms. As multinational firms have increased over time and more of their operations have been located overseas, understanding the more recent leverage dynamics is an important pursuit for finance researchers. The variation in tax rates across countries and the ability of firms to defer the US tax consequences of those operations has led to tax effect empirical estimates that differ from theory and from historical empirical findings. We contribute to our understanding of that inconsistency by employing proprietary data that enables a more accurate estimate of the true tax rate confronting firms. Our results sustain the theory and early findings that variation in tax rates are indeed of first order importance in explaining leverage.

Irrespective of whether we examine leverage ratios based on book values or market values, whether we include cash or not, or if we alternatively examine interest coverage, we find that multinational firms confronting lower tax rates use less debt. The results are not only statistically significant, but the coefficient magnitudes suggest that these effects are first order; the changes in leverage associated with reasonable moves in estimated tax rates are of magnitudes similar to other well-documented factors explaining variation in corporate debt usage. Also, consistent with the notion that the variation in tax rates firms confront does not vary greatly over time and instead primarily varies across firms, our results are stronger when we solely focus on the cross-sectional variation in our data set (employing between regression specifications) instead of allowing both time-series and cross-sectional variation (the OLS specifications).

As the international component of firms operations increases, the true tax rates that firms confront will continually be less driven by the US tax code. The lack of publicly available data on the international operations of firms will therefore continue to plague efforts by empirical researchers looking to understand corporate financial policies. The results in this paper, due to our access to generally unavailable data demonstrates the significant difference in our understanding of corporate financial policies, and the resulting inferences that can be made, when moving from publicly available data to more accurate measures of their operations. These results demonstrate the increasing need for more comprehensive data on the international operations of publicly traded firms to be more fully disclosed.

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Table 1

Summary Statistics

Table 1 presents the summary statistics for our variables. The first group is for the entire Compustat universe, the second group is for firms that are not in the BEA sample, and the third group represents our sample of BEA firms. For each group, we present the number of observations for each variable, the mean, median, and standard deviation. To preserve the confidentiality of the firm-level data collected by BEA, the median reported is actually the average of the inner nine firms for each variable. *Firm_efftax rate* is calculated using the weighted average of affiliate earning for each firm for each year., *Mtr* represents Graham's (1996a) marginal tax rate, and *Bcg_mtr* represents Blouin, Core, and Guay's (2010) marginal tax rate.

Control variables include *MV Lev* calculated as sum of short-term and long-term debt divided by the value of debt plus the firm's equity market capitalization, *BV Lev* is calculated as the sum of short-term and long-term debt divided by the sum of short-term debt, long-term debt, and the book value of shareholder's equity, *Net MV Lev* is calculated as *MV Lev* less cash less marketable securities, *Net BV Lev* is calculated as *BV Lev* less cash less marketable securities, and *Int Cov* is defined as the natural log of one plus the interest coverage ratio which is defined as EBITDA divided by interest expense.

$Sales_{i,t-1}$ is calculated as the natural logarithm of sales, $Rated_{i,t}$ is calculated as one if the firm has a bond rating for any month during the fiscal year, $Ppeb_{i,t}$ is calculated as PP&E divided by book assets, $Roa_{i,t}$ is calculated as EBIT divided by book assets, $Divs_{i,t}$ is calculated as one if the firm pays dividends and zero otherwise, $Rd_{i,t}$ is calculated as R&D expense divided by sales, $Adv_{i,t}$ is calculated as advertising expense divided by sales, $MB_{i,t}$ is calculated as book liabilities plus the market value of equity divided by book assets, and finally $Depr_{i,t}$ is calculated as depreciation divided by assets. All ratios are winsorized at the 1st and 99th percentiles.

	Compustat				Non-BEA Firms				BEA Firms			
	Obs	Mean	Median	St. Dev.	Obs	Mean	Median	St. Dev.	Obs	Mean	Median	St. Dev.
Firm_efftaxrat									11,203	0.3353	0.3375	0.0494
Mtr	38,420	0.2560	0.3414	0.1326	27,217	0.2350	0.3367	0.1393	11,203	0.3069	0.3500	0.0972
Bcg_mtr	38,420	0.2738	0.3235	0.0978	27,217	0.2558	0.3041	0.1033	11,203	0.3174	0.3410	0.0649
MV Lev	37,186	0.2443	0.1659	0.2529	26,157	0.2530	0.1641	0.2672	11,029	0.2239	0.1565	0.2138
BV Lev	38,309	0.3754	0.2974	0.4373	27,141	0.3838	0.2787	0.4781	11,168	0.3549	0.3039	0.3159
Net MV Lev	37,184	0.1227	0.0926	0.3383	26,155	0.1217	0.0873	0.3635	11,029	0.1252	0.0710	0.2696
Net BV Lev	38,307	0.1560	0.1788	0.5794	27,139	0.1482	0.1597	0.6283	11,168	0.1748	0.1476	0.4378
Int Cov	34,904	44.858	5.8409	177.88	24,210	44.254	4.2975	182.34	10,694	46.225	10.242	166.326
$Sales_{i,t}$	38,420	2,189	209.5	10,717	27,217	911	100.627	4,743	11,203	5292.596	1414	18,046
$Rated_{i,t}$	38,420	0.2672	0.000	0.4425	27,217	.01734	0.000	0.3786	11,203	0.4951	1.000	0.5000
$Ppeb_{i,t}$	38,420	0.2825	0.2177	0.2290	27,217	.02889	0.2149	0.2440	11,203	0.2668	0.1866	0.1869
$Roa_{i,t}$	38,420	0.0642	0.1144	0.2309	27,217	0.0355	0.1016	0.2592	11,203	0.1338	0.1270	0.1127

$Divs_{i,t}$	38,420	0.3038	0.000	0.4877	27,217	0.3101	0.000	0.4625	11,203	0.5828	1.000	0.4931
$Rd_{i,t}$	38,420	0.1191	0.000	0.4406	27,217	0.1486	0.000	0.5124	11,203	0.0476	0.0106	0.1440
$Adv_{i,t}$	38,420	0.0111	0.000	0.0602	27,217	0.0114	0.000	0.0689	11,203	0.0106	0.000	0.0298
$Mb_{i,t}$	38,420	2.2851	1.5084	2.1616	27,217	2.4122	1.4995	2.3684	11,203	1.9762	1.5344	1.5040
$Depr_{i,t}$	38,420	0.0518	0.0414	0.0544	27,217	0.0544	0.0419	0.0617	11,203	0.0456	0.03633	0.0289

Table 2
Book Leverage Regressions
The table reports the book leverage, Graham's *mtr*, Blouin, Core, and Guay's *Bcg_mtr*, and our new measure *firm_efftaxrate* by2-digit SIC code industry for five industries with a high percentage of domestic income and five industries with a low percentage of domestic income. Averages across the high and low domestic percentage groups are also presented.

2-digit SIC Code	*Industry Name*	*Percent Domestic*	*Book Leverage*	*Firm_efftaxrate*	*Bcg_mtr*	*Mtr*
Low Domestic Percentage Industries						
28	Chemical & Allied Products	30.1%	0.347	0.290	0.346	0.306
29	Petroleum and Coal Products	10.4%	0.158	0.288	0.347	0.312
33	Primary Metal Industries	44.2%	0.315	0.320	0.347	.0307
35	Industrial Machinery and Equipment	42.1%	0.295	0.296	0.345	0.305
39	Miscellaneous Manufacturing	39.9%	0.323	0.291	0.341	0.300
Low Domestic Industry Averages		33.3%	0.288	0.297	0.345	0.251
High Domestic Percentage Industries						
23	Apparel and Other Textile Products	83.5%	0.344	0.346	0.345	0.211
27	Printing and Publishing	78.9%	0.455	0.343	0.342	0.286
48	Communications	80.0%	0.471	0.346	0.328	0.228
56	Apparel and Accessory Stores	78.0%	0.228	0.342	0.347	0.326
80	Health Services	95.7%	0.719	0.348	0.344	0.098
High Domestic Industry Averages		83.2%	0.443	0.345	0.341	0.230

Table 3
Book Leverage Regressions
The table reports the results from estimating the following OLS equation in columns I-IV:

$$BV\ Lev_{i,t} = \beta_0 + \beta_1 tax + \beta_2 sales_{i,t-1} + \beta_3 rated_{i,t} + \beta_4 ppeb_{i,t} + \beta_5 roa_{i,t} + \beta_6 divs_{i,t} + \beta_7 rd_{i,t} + \beta_8 adv_{i,t} + \beta_9 mb_{i,t} + \beta_{10} depr_{i,t} + \sum_{i=0}^{14} \beta_{11+i} dyear(1995+i) + \epsilon_{i,t}$$

Columns V-VIII report the results from estimation using between effects which is the OLS estimator applied to the following time-averaged equation:

$$BV\ \overline{Lev_\iota} = \beta_0 + \beta_1 tax + \beta_2 \overline{sales_\iota} + \beta_3 \overline{rated_\iota} + \beta_4 \overline{ppeb_\iota} + \beta_5 \overline{roa_\iota} + \beta_6 \overline{divs_\iota} + \beta_7 \overline{rd_\iota} + \beta_8 \overline{adv_\iota} + \beta_9 \overline{mb_\iota} + \beta_{10} \overline{depr_\iota} + \epsilon_{i,t}$$

Where $\overline{Lev_\iota}$ represents the average across time, i.e. $\sum_{t=1}^{T} \frac{Lev_{i,t}}{T}$.
The dependent variable is the book value of leverage (*BV Lev*) for firm *i* in year *t*. *tax* is our measure of the tax rate facing each multinational firm. The base case is in Column I and V, Graham's *mtr* in Column II and VI, Blouin, Core, and Guay's *bcg_mtr* in Column III and VII, and our new measure *firm_efftaxrate* in Column IV and VIII. The independent variables include the natural logarithm of sales ($sales_{i,t}$), a dummy variable to indicate if the firm has a credit rating ($rated_{i,t}$), property, plant, and equipment over lagged book assets ($ppeb_{i,t}$), return on assets ($roa_{i,t}$), a dummy variable set to 1 if the firm pays a dividend ($divs_{i,t}$), research and development expense ($rd_{i,t}$), advertising expense ($adv_{i,t}$), market-to-book ratio ($mb_{i,t}$), depreciation expense ($depr_{i,t}$), and finally year dummy variables (e.g. *dyear2007*). Standard errors are clustered at the firm level. Standard errors are reported in parenthesis. ***, **, * represent significance at the one percent, five percent, and ten percent levels, respectively.

	I	II	III	IV	V	VI	VII	VIII
$Mtr_{i,t}$		-0.3570***				-0.4455***		
		(0.0593)				(0.1038)		
$Bcg\_mtr_{i,t}$			-0.5453***				-0.4273***	
			(0.1382)				(0.1349)	
$Firm\_efftaxrate_{i,t}$				0.2688**				0.7111***
				(0.0988)				(0.1717)
$Sales_{i,t}$	-0.0112**	-0.0073	-0.0051	-0.0100**	-0.0152**	-0.0103*	-0.101	-0.0109*
	(0.0048)	(0.0047)	(0.0050)	(0.0047)	(0.0061)	(0.0061)	(0.0062)	(0.0061)
$Rated_{i,t}$	0.2332***	0.2301***	0.2319***	0.2318***	0.2612***	0.2583***	0.2604***	0.2562***
	(0.0161)	(0.0159)	(0.0161)	(0.0160)	(0.0224)	(0.0223)	(0.0223)	(0.0495)
$Ppeb_{i,t}$	0.1968***	0.1931***	0.2050***	0.1940***	0.2676***	0.2681***	0.2845***	0.2554***
	(0.0386)	(0.0380)	(0.0386)	(0.0384)	(0.0497)	(0.0494)	(0.0498)	(0.0495)
$Roa_{i,t}$	-0.4177***	-0.3092***	-0.3006***	-0.4204***	-0.4875***	-0.3317***	-0.3703***	-0.5014***
	(0.0868)	(0.0841)	(0.0880)	(0.0869)	(0.0745)	(0.0826)	(0.0830)	(0.0742)
$Divs_{i,t}$	-0.0291**	-0.0222*	-0.0248*	-0.0303**	-0.0295	-0.0209	-0.0240	-0.0389**
	(0.0127)	(0.0125)	(0.0127)	(0.0127)	(0.0184)	(0.0184)	(0.0184)	(0.0185)
$Rd_{i,t}$	-0.1255	-0.1366	-0.1462*	-0.1224	-0.1346***	-0.1482***	-0.1482***	-0.1221***
	(0.0830)	(0.0836)	(0.0852)	(0.0819)	(0.0475)	(0.0474)	(0.0476)	(0.0474)
$Adv_{i,t}$	0.7100**	0.6981*	0.6889**	0.7223**	0.4534*	0.4499*	0.4510*	0.4929*
	(0.3221)	(0.3189)	(0.3257)	(0.3205)	(0.2730)	(0.2716)	(0.2723)	(0.2719)
$Mb_{i,t}$	0.0087**	0.0074	0.0066	0.0087	0.0274***	0.0260***	0.0266***	0.0272***
	(0.0073)	(0.0073)	(0.0075)	(0.0073)	(0.0053)	(0.0053)	(0.0053)	(0.0052)
$Depr_{i,t}$	0.2574	0.1184	0.0402	0.2655	0.5837**	0.3812	0.3769	0.5890**
	(0.2742)	(0.2640)	(0.2730)	(0.2741)	(0.2760)	(0.2786)	(0.2829)	(0.2747)
N	11,168	11,168	11,168	11,168	11,168	11,168	11,168	11,168
R^2	0.1582	0.1671	0.1650	0.1595	0.1586	0.1672	0.1633	0.1666

Table 4
Market Leverage Regressions
The table reports the results from estimating the following OLS equation in columns I-IV:

$$MV\ Lev_{i,t} = \beta_0 + \beta_1 tax + \beta_2 sales_{i,t-1} + \beta_3 rated_{i,t} + \beta_4 ppeb_{i,t} + \beta_5 roa_{i,t} + \beta_6 divs_{i,t} + \beta_7 rd_{i,t} + \beta_8 adv_{i,t} + \beta_9 mb_{i,t} + \beta_{10} depr_{i,t} + \sum_{i=0}^{14} \beta_{11+i} dyear(1995+i) + \epsilon_{i,t}$$

Columns V-VIII report the results from estimation using between effects which is the OLS estimator applied to the following time-averaged equation:

$$MV\ \overline{Lev_i} = \beta_0 + \beta_1 tax + \beta_2 \overline{sales_i} + \beta_3 \overline{rated_i} + \beta_4 \overline{ppeb_i} + \beta_5 \overline{roa_i} + \beta_6 \overline{divs_i} + \beta_7 \overline{rd_i} + \beta_8 \overline{adv_i} + \beta_9 \overline{mb_i} + \beta_{10} \overline{depr_i} + \epsilon_{i,t}$$

Where $\overline{Lev_i}$ represents the average across time, i.e. $\sum_{t=1}^{T} \frac{Lev_{i,t}}{T}$.
The dependent variable is the market value of leverage (*MV Lev*) for firm *i* in year *t*. *tax* is our measure of the tax rate facing each multinational firm. The base case is in Column I and V, Graham's *mtr* in Column II and VI, Blouin, Core, and Guay's *bcg_mtr* in Column III and VII, and our new measure *firm_efftaxrate* in Column IV and VIII. The independent variables include the natural logarithm of sales ($sales_{i,t}$), a dummy variable to indicate if the firm has a credit rating ($rated_{i,t}$), property, plant, and equipment over lagged book assets ($ppeb_{i,t}$), return on assets ($roa_{i,t}$), a dummy variable set to 1 if the firm pays a dividend ($divs_{i,t}$), research and development expense ($rd_{i,t}$), advertising expense ($adv_{i,t}$), market-to-book ratio ($mb_{i,t}$), depreciation expense ($depr_{i,t}$), and finally year dummy variables (e.g. *dyear2007*). Standard errors are clustered at the firm level. Standard errors are reported in parenthesis. ***, **, * represent significance at the one percent, five percent, and ten percent levels, respectively.

	I	II	III	IV	V	VI	VII	VIII
$Mtr_{i,t}$		-0.2307***				-0.3244***		
		(0.0353)				(0.0609)		
$Bcg\_mtr_{i,t}$			-0.3296***				-0.3088***	
			(0.0876)				(0.0791)	
$Firm\_efftaxrate_{i,t}$				0.0609				0.2922***
				(0.0680)				(0.1006)
$Sales_{i,t}$	-0.0112***	-0.0087**	-0.0075**	-0.0110***	-0.0094***	-0.0060*	-0.0058	-0.0076**
	(0.0034)	(0.0034)	(0.0035)	(0.0035)	(0.0036)	(0.0036)	(0.0037)	(0.0036)
$Rated_{i,t}$	0.1243***	0.1222***	0.01233***	0.1240***	0.1362***	0.1340***	0.1351***	0.1344***
	(0.0097)	(0.0097)	(0.0098)	(0.0098)	(0.0132)	(0.0131)	(0.0132)	(0.0132)
$Ppeb_{i,t}$	0.1988***	0.1962***	0.2029***	0.1982***	0.2322***	0.2324***	0.2431***	0.2277***
	(0.0248)	(0.0245)	(0.0248)	(0.0248)	(0.0296)	(0.0293)	(0.0296)	(0.0295)
$Roa_{i,t}$	-0.3474***	-0.2763***	-0.2716***	-0.3484***	-0.2639***	-0.1514***	-0.1737***	-0.2715***
	(0.0080)	(0.0356)	(0.0399)	(0.0366)	(0.0452)	(0.0496)	(0.0506)	(0.0452)
$Divs_{i,t}$	-0.0340***	-0.0295***	-0.0314***	-0.0343***	-0.0448***	-0.0382***	-0.0406***	-0.0488***
	(0.0080)	(0.0079)	(0.0079)	(0.0080)	(0.0108)	(0.0108)	(0.0108)	(0.0109)
$Rd_{i,t}$	-0.1399***	-0.1461***	-0.01488***	-0.1394***	-0.1048***	-0.1152***	-0.1105***	-0.1009***
	(0.0389)	(0.0389)	(0.0397)	(0.3865)	(0.0291)	(0.0289)	(0.0290)	(0.0290)
$Adv_{i,t}$	0.1201	0.1176	0.1116	0.1227	0.0208	0.0236	0.0238	0.0326
	(0.1267)	(0.1278)	(0.1303)	(0.1264)	(0.1651)	(0.1638)	(0.1644)	(0.0109)
$Mb_{i,t}$	-0.0548***	-0.0560***	-0.0572***	-0.0547	-0.0672***	-0.0680***	-0.0696***	-0.0667***
	(0.0041)	(0.0040)	(0.0039)	(0.0041)	(0.0050)	(0.0050)	(0.0050)	(0.0050)
$Depr_{i,t}$	-0.2455*	-0.3372**	-0.3791***	-0.2436*	-0.0165	-0.1667	-0.1637	-0.0159
	(0.1447)	(0.1384)	(0.1447)	(0.1446)	(0.1618)	(0.1630)	(0.1655)	(0.1614)
N	11,029	11,029	11,029	11,029	11,029	11,029	11,029	11,029
R^2	0.3101	0.3181	0.3155	0.3102	0.2759	0.2874	0.2822	0.2794

Table 5
Net Book Leverage Regressions
The table reports the results from estimating the following OLS equation in columns I-IV:

$$Net\ BV\ Lev_{i,t} = \beta_0 + \beta_1 tax + \beta_2 sales_{i,t-1} + \beta_3 rated_{i,t} + \beta_4 ppeb_{i,t} + \beta_5 roa_{i,t} + \beta_6 divs_{i,t} + \beta_7 rd_{i,t} + \beta_8 adv_{i,t} + \beta_9 mb_{i,t} + \beta_{10} depr_{i,t} + \sum_{i=0}^{14} \beta_{11+i} dyear(1995+i) + \epsilon_{i,t}$$

Columns V-VIII report the results from estimation using between effects which is the OLS estimator applied to the following time-averaged equation:

$$Net\ BV\ \overline{Lev_i} = \beta_0 + \beta_1 tax + \beta_2 \overline{sales_i} + \beta_3 \overline{rated_i} + \beta_4 \overline{ppeb_i} + \beta_5 \overline{roa_i} + \beta_6 \overline{divs_i} + \beta_7 \overline{rd_i} + \beta_8 \overline{adv_i} + \beta_9 \overline{mb_i} + \beta_{10} \overline{depr_i} + \epsilon_{i,t}$$

Where $\overline{Lev_i}$ represents the average across time, i.e. $\sum_{t=1}^{T} \frac{Lev_{i,t}}{T}$.
The dependent variable is net book value of leverage (*Net BV Lev*) for firm *i* in year *t*. *tax* is our measure of the tax rate facing each multinational firm. The base case is in Column I and V, Graham's *mtr* in Column II and VI, Blouin, Core, and Guay's *bcg_mtr* in Column III and VII, and our new measure *firm_efftaxrate* in Column IV and VIII. The independent variables include the natural logarithm sales ($sales_{i,t}$), a dummy variable to indicate if the firm has a credit rating ($rated_{i,t}$), property, plant, and equipment over lagged book assets ($ppeb_{i,t}$), return on assets ($roa_{i,t}$), depreciation expense ($depr_{i,t}$), a dummy variable set to 1 if the firm pays a dividend ($divs_{i,t}$), research and development expense ($rd_{i,t}$), advertising expense ($adv_{i,t}$), market-to-book ratio ($mb_{i,t}$), and finally year dummy variables (e.g. *dyear2007*). Standard errors are clustered at the firm level. Standard errors are reported in parenthesis. ***, **, * represent significance at the one percent, five percent, and ten percent levels, respectively.

	I	II	III	IV	V	VI	VII	VIII
$Mtr_{i,t}$		-0.2354***				-0.2909**		
		(0.0782)				(0.1324)		
$Bcg\_mtr_{i,t}$			-0.0969				0.2345	
			(0.1766)				(0.1718)	
$Firm\_efftaxrate_{i,t}$				0.6663***				1.4416***
				(0.1525)				(0.2166)
$Sales_{i,t}$	-0.0075	-0.0049	-0.0064	-0.0047	-0.0184**	-0.0155**	-0.0211***	-0.0096
	(0.0070)	(0.0070)	(0.0072)	(0.0068)	(0.0077)	(0.0078)	(0.0080)	(0.0077)
$Rated_{i,t}$	0.2699***	0.2678	0.2697***	0.2664***	0.3138***	0.3121***	0.3143***	0.3037***
	(0.0216)	(0.0216)	(0.0216)	(0.0214)	(0.0285)	(0.0285)	(0.0285)	(0.0282)
$Ppeb_{i,t}$	0.4721***	0.4697***	0.4736***	0.4652***	0.5825***	0.5828***	0.5732***	0.5577***
	(0.0506)	(0.0503)	(0.0505)	(0.0501)	(0.0631)	(0.0630)	(0.0634)	(0.0625)
$Roa_{i,t}$	-0.3552***	-0.2836***	-0.3344***	-0.3619***	-0.4048***	-0.3100***	-0.4691***	-0.4329***
	(0.1092)	(0.1099)	(0.1164)	(0.1089)	(0.0947)	(0.1053)	(0.1057)	(0.0936)
$Divs_{i,t}$	0.0154	0.0199	0.0161	0.0123	0.0258	0.0310	0.0228	0.0068
	(0.0184)	(0.0182)	(0.0184)	(0.0182)	(0.0234)	(0.0235)	(0.0235)	(0.0233)
$Rd_{i,t}$	-0.4803***	-0.4876***	-0.4840***	-0.4727***	-0.5050***	-0.5133***	-0.4976***	-0.4797***
	(0.1471)	(0.1481)	(0.1472)	(0.1441)	(0.0604)	(0.0604)	(0.0606)	(0.0598)
$Adv_{i,t}$	0.7158*	0.7079*	0.7120*	0.7463*	0.5022	0.5000	0.5035	0.5821*
	(0.3941)	(0.3926)	(0.3953)	(0.3903)	(0.3468)	(0.3465)	(0.3467)	(0.3429)
$Mb_{i,t}$	-0.0141	-0.0150	-0.0145	-0.0140	0.0123*	0.0115*	0.0127*	0.0119*
	(0.0099)	(0.0099)	(0.0100)	(0.0098)	(0.0067)	(0.0067)	(0.0067)	(0.0066)
$Depr_{i,t}$	-0.1817	-0.2734	-0.2203	-0.1617	0.0909	-0.0322*	0.2044	0.1016
	(0.3609)	(0.3559)	(0.3677)	(0.3600)	(0.3506)	(0.0550)	(0.3603)	(0.3464)
N	11,168	11,168	11,168	11,168	11,168	11,168	11,168	11,168
R^2	0.2114	0.2134	0.2115	0.2157	0.2172	0.2190	0.2180	0.2361

Table 6
Net Market Leverage Regressions
The table reports the results from estimating the following OLS equation in columns I-IV:

$$Net\ MV\ Lev_{i,t} = \beta_0 + \beta_1 tax + \beta_2 sales_{i,t-1} + \beta_3 rated_{i,t} + \beta_4 ppeb_{i,t} + \beta_5 roa_{i,t} + \beta_6 divs_{i,t} + \beta_7 rd_{i,t} + \beta_8 adv_{i,t} + \beta_9 mb_{i,t} + \beta_{10} depr_{i,t} + \sum_{i=0}^{14} \beta_{11+i} dyear(1995+i) + \epsilon_{i,t}$$

Columns V-VIII report the results from estimation using between effects which is the OLS estimator applied to the following time-averaged equation:

$$Net\ MV\ \overline{Lev_i} = \beta_0 + \beta_1 tax + \beta_2 \overline{sales_i} + \beta_3 \overline{rated_i} + \beta_4 \overline{ppeb_i} + \beta_5 \overline{roa_i} + \beta_6 \overline{divs_i} + \beta_7 \overline{rd_i} + \beta_8 \overline{adv_i} + \beta_9 \overline{mb_i} + \beta_{10} \overline{depr_i} + \epsilon_{i,t}$$

Where $\overline{Lev_i}$ represents the average across time, i.e. $\sum_{t=1}^{T} \frac{Lev_{i,t}}{T}$.
The dependent variable is the net market value of leverage (*Net MV Lev*) for firm *i* in year *t*. *tax* is our measure of the tax rate facing each multinational firm. The base case is in Column I and V, Graham's *mtr* in Column II and VI, Blouin, Core, and Guay's *bcg_mtr* in Column III and VII, and our new measure *firm_efftaxrate* in Column IV and VIII. The independent variables include the natural logarithm of sales ($sales_{i,t}$), a dummy variable to indicate if the firm has a credit rating ($rated_{i,t}$), property, plant, and equipment over lagged book assets ($ppeb_{i,t}$), return on assets ($roa_{i,t}$), a dummy variable set to 1 if the firm pays a dividend ($divs_{i,t}$), research and development expense ($rd_{i,t}$), advertising expense ($adv_{i,t}$), market-to-book ratio ($mb_{i,t}$), depreciation expense ($depr_{i,t}$), and finally year dummy variables (e.g. *dyear2007*). Standard errors are clustered at the firm level. Standard errors are reported in parenthesis. ***, **, * represent significance at the one percent, five percent, and ten percent levels, respectively.

	I	II	III	IV	V	VI	VII	VIII
$Mtr_{i,t}$		-0.1049**				-0.0156		
		(0.0468)				(0.0843)		
$Bcg\_mtr_{i,t}$			0.0213				0.3122***	
			(0.1185)				(0.1089)	
$Firm\_efftaxrate_{i,t}$				0.2550***				0.8958***
				(0.0955)				(0.1368)
$Sales_{i,t}$	-0.0050	-0.0039	-0.0053	-0.0039	-0.0085*	-0.0084*	-0.0122**	-0.0031
	(0.0044)	(0.0045)	(0.0045)	(0.0044)	(0.0049)	(0.0843)	(0.0051)	(0.0049)
$Rated_{i,t}$	0.1456***	0.1447***	0.1457***	0.1444***	0.1764***	0.1763***	0.1775***	0.1708***
	(0.0125)	(0.0125)	(0.0125)	(0.0125)	(0.0181)	(0.0182)	(0.0181)	(0.0179)
$Ppeb_{i,t}$	0.3320***	0.3309***	0.3318***	0.3296***	0.3986***	0.3986***	0.3875***	0.3848***
	(0.0296)	(0.0296)	(0.02962)	(0.0295)	(0.0406)	(0.0406)	(0.0407)	(0.0402)
$Roa_{i,t}$	-0.1980***	-0.1657***	-0.2029***	-0.2019***	-0.0654	-0.0600	-0.1567**	-0.0884
	(0.0490)	(0.0496)	(0.0528)	(0.0486)	(0.0621)	(0.0686)	(0.0696)	(0.0614)
$Divs_{i,t}$	-0.0046	-0.0026	-0.0048	-0.0058	-0.0069	-0.0066	-0.0111	-0.0191
	(0.0105)	(0.0104)	(0.0105)	(0.0105)	(0.0149)	(0.0150)	(0.0149)	(0.0148)
$Rd_{i,t}$	-0.2256***	-0.2284***	-0.2250***	-0.2235***	-0.1843***	-0.1848***	-0.1785***	-0.1723***
	(0.0638)	(0.0642)	(0.0642)	(0.0628)	(0.0399)	(0.0399)	(0.0399)	(0.0395)
$Adv_{i,t}$	0.0209	0.0197	0.0214	0.0318	-0.1641	-0.1639	-0.1670	-0.1280
	(0.1778)	(0.1786)	(0.1776)	(0.1768)	(0.2267)	(0.2267)	(0.2262)	(0.2241)
$Mb_{i,t}$	-0.0388***	-0.0393***	-0.0386***	-0.0385***	-0.0434***	-0.0435***	-0.0410***	-0.0420***
	(0.0045)	(0.0045)	(0.0045)	(0.0045)	(0.0069)	(0.0069)	(0.0069)	(0.0068)
$Depr_{i,t}$	-0.5360***	-0.5777***	-0.5273***	-0.5281***	-0.2533	-0.2605	-0.1045	-0.2515
	(0.1767)	(0.1777)	(0.1838)	(0.1756)	(0.2221)	(0.2256)	(0.2276)	(0.2195)
N	11,029	11,029	11,029	11,029	11,029	11,029	11,029	11,029
R^2	0.2344	0.2355	0.2345	0.2361	0.2249	0.2249	0.2285	0.2434

Table 7
Interest Coverage Regressions
The table reports the results from estimating the following OLS equation in columns I-IV:

$$IntCov_t = \beta_0 + \beta_1 tax + \beta_2 sales_{i,t-1} + \beta_3 rated_{i,t} + \beta_4 ppeb_{i,t} + \beta_5 roa_{i,t} + \beta_6 divs_{i,t} + \beta_7 rd_{i,t} + \beta_8 adv_{i,t} + \beta_9 mb_{i,t} + \beta_{10} depr_{i,t} + \sum_{i=0}^{14} \beta_{11+i} dyear(1995+i) + \epsilon_{i,t}$$

Columns V-VIII report the results from estimation using between effects which is the OLS estimator applied to the following time-averaged equation:

$$\overline{IntCov_i} = \beta_0 + \beta_1 tax + \beta_2 \overline{sales_i} + \beta_3 \overline{rated_i} + \beta_4 \overline{ppeb_i} + \beta_5 \overline{roa_i} + \beta_6 \overline{divs_i} + \beta_7 \overline{rd_i} + \beta_8 \overline{adv_i} + \beta_9 \overline{mb_i} + \beta_{10} \overline{depr_i} + \epsilon_{i,t}$$

Where $\overline{IntCov_i}$ represents the average across time, i.e. $\sum_{t=1}^{T} \frac{IntCov_{i,t}}{T}$.
The dependent variable is the interest coverage (*IntCov*) for firm *i* in year *t*. *tax* is our measure of the tax rate facing each multinational firm. The base case is in Column I and V, Graham's *mtr* in Column II and VI, Blouin, Core, and Guay's *bcg_mtr* in Column III and VII, and our new measure *firm_efftaxrate* in Column IV and VIII. The independent variables include the natural logarithm of sales ($sales_{i,t}$), a dummy variable to indicate if the firm has a credit rating ($rated_{i,t}$), property, plant, and equipment over lagged book assets ($ppeb_{i,t}$), return on assets ($roa_{i,t}$), a dummy variable set to 1 if the firm pays a dividend ($divs_{i,t}$), research and development expense ($rd_{i,t}$), advertising expense ($adv_{i,t}$), market-to-book ratio ($mb_{i,t}$), depreciation expense ($depr_{i,t}$), and finally year dummy variables (e.g. *dyear2007*). Standard errors are clustered at the firm level. Standard errors are reported in parenthesis. ***, **, * represent significance at the one percent, five percent, and ten percent levels, respectively.

	I	II	III	IV	V	VI	VII	VIII
$Mtr_{i,t}$		2.1124***				2.7893***		
		(0.3258)				(0.5716)		
$Bcg\_mtr_{i,t}$			2.9903***				1.1021	
			(0.7965)				(0.7433)	
$Firm\_efftaxrate_{i,t}$				-1.5665**				-3.1787***
				(0.7731)				(0.9246)
$Sales_{i,t-1}$	0.0424	0.0195	0.0098	0.0360	-0.0115	-0.0391	-0.0233	-0.0305
	(0.0305)	(0.0303)	(0.0303)	(0.0305)	(0.0328)	(0.0331)	(0.0338)	(0.0332)
$Rated_{i,t}$	-1.1086***	-1.0889***	-1.103***	-1.1006***	-1.0947***	-1.0764***	-1.0945***	-1.0730***
	(0.0825)	(0.0817)	(0.0829)	(0.0820)	(0.1204)	(0.1197)	(0.1203)	(0.1202)
$Ppeb_{i,t}$	-1.2647***	-1.2369***	-1.309***	-1.2484***	-1.7568***	-1.7488***	-1.7950***	-1.7060***
	(0.1759)	(0.1724)	(0.1744)	(0.1751)	(0.2678)	(0.2661)	(0.2689)	(0.2674)
$Roa_{i,t}$	6.5770***	5.9284***	5.9294***	6.5907***	6.65533***	5.6455***	6.3306***	6.7180***
	(0.4657)	(0.4624)	(0.4986)	(0.4655)	(0.4033)	(0.4510)	(0.4588)	(0.4025)
$Divs_{i,t}$	0.0659	0.0256	0.0411	0.0729	0.2012**	0.1496	0.1857*	0.2418**
	(0.0705)	(0.0703)	(0.0703)	(0.0700)	(0.0989)	(0.0988)	(0.0994)	(0.0993)
$Rd_{i,t}$	1.5415***	1.6031***	1.6540***	1.5241***	1.5955***	1.6727***	1.6265***	1.5428***
	(0.5105)	(0.5074)	(0.5175)	(0.5035)	(0.2541)	(0.2530)	(0.2549)	(0.2538)
$Adv_{i,t}$	-1.7315**	-1.6589*	-1.6151*	-1.8024**	-1.8848	-1.8292	-1.8723	-2.0635
	(0.8769)	(0.8793)	(0.8994)	(0.8821)	(1.4591)	(1.4498)	(1.4586)	(1.4556)
$Mb_{i,t}$	-1.7315**	0.1630***	0.1670***	0.1556***	0.0925***	0.1005***	0.0941***	0.0932***
	(0.8769)	(0.0359)	(0.03670)	(0.0354)	(0.0283)	(0.0282)	(0.0283)	(0.0282)
$Depr_{i,t}$	0.6035	1.4277	1.7857	0.5543	0.7929	2.0915	1.3218	0.7723
	(1.4899)	(1.4120)	(1.4675)	(1.4915)	(1.5139)	(1.5228)	(1.5548)	(1.5093)
N	11,036	11,036	11,036	11,036	11,036	11,036	11,036	11,036
R^2	0.2611	0.2696	0.2668	0.2624	0.2281	0.2384	0.2291	0.2332