The role of corporate and investor taxes in affecting corporate policies: A review of John R. Graham articles

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Abstract

John R. Graham has contributed tremendously to the development of tax research and capital structure through 12 of his articles and his 2003 paper “Taxes and corporate finance: A review” is of particular significance. This paper summarizes his articles and highlights the substantial progress that he has made on the role of taxes in corporate financial decision.

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1. Introduction

Previous works on the effect of taxes on capital structure by Graham, especially those of an empirical nature, can be divided into a few categories: studies that examine whether corporate taxes affect debt versus equity policy, whether the tax advantage of debt increases firm value, whether personal taxes affect corporate debt versus equity policy, whether low tax rate firms lease from high tax rate lessors, whether participating in a tax shelter is related to corporate debt policy and whether the simulated book marginal tax return (MTR) does a better job of explaining financial statement debt ratios than does the analogous tax return variable. Given the few broad categories above, this paper presents a review of the literature in the five categories identified above.

2. Studies on whether corporate taxes affect debt policy

Some of the earliest works of Graham focussed on the best way to measure marginal tax return (MTR) and how MTR can influence a company’s corporate debt policy. He believes that the failure to explicitly calculate MTR, would lead to the conclusion that tax considerations are not an important factor in corporate financial decisions.

Graham (1996a) was among the first to argue that researchers should capture the effects of non-debt tax shields (NDTS), existing interest and the probability of experiencing losses directly in the estimated MTR, rather than including these factors as stand-alone variables. In this paper, he shows that the impact on debt policy of traditional measures of NDTS, such as depreciation expense and the investment tax credit on the MTR calculation appear to be small in comparison to the influence of net operating losses. He also explains that firms with net operating losses status will issue debt less aggressively than firms without net operating losses status. So these two firms will have different estimation of MTR. By not putting all these factors together, researchers might interpret the result wrongly.

In a similar vein, when testing for tax effects on the firm’s debt policy, Graham (1996a) captured the effects of profitability directly in the estimated MTR. Since many argue that profitable firms should use more debt since they usually have high tax rates, Graham suggests that profitability should only affect the tax incentive to use debt to the extent that it affects the corporate MTR. This suggestion is consistent with Myers’ (1993) findings which indicate that the use of debt declines with profitability.

Graham (1996a) also examined the relation between changes in the debt ratio and lagged simulated MTRs. He discovered positive tax effects for a large sample of Compustat firms. He also documented a positive relation between tax rates and changes in debt ratios for debt levels. This was followed by a series of his other works, notably Graham, Lemmon, and Schallheim (1998) and Graham (1999). These two studies also employed simulated tax rates.
to document tax effects in debt decisions. Graham, Lemmon, and Schallheim (1998) measure tax rates before financing (i.e., based on income before interest is deducted). They found that corporate MTR is positively related to debt usage, but negatively related to the use of operating leases. They also discovered that the propensity to lease (use debt) increases (decreases) with the expected costs of financial distress. On the other hand, Graham (1999) investigates the degree to which personal taxes affect corporate financing decisions. He deduced that the corporate tax is positively related to debt usage and a personal tax is negatively related to debt usage.

In another paper, Graham and Rogers (2002) used simultaneous equations to investigate the capital structure decision to determine whether firms hedge to increase debt capacity. They used two different equations to regress derivatives usage on variables that explain corporate hedging and debt ratios on variables that explain debt policy. They found that hedging leads to greater debt usage. For the average firm, hedging with derivatives increases the debt ratio by 3 percent and adds tax shields equal to 1.1 percent of firm value.

Graham’s works on MTR was followed by Graham, Lang, and Shackelford (2004) study on the effects of the option deduction on debt policy. As claimed by DeAngelo and Masulis (1980) that debt substitutes can lead to a firm-specific optimal leverage decision, this paper explains in part why some firms use so little debt despite many advantages that they will obtain by being levered. Graham, Lang, and Shackelford (2004) showed that option deductions are substitute for interest deductions in corporate capital structure decisions and found that the magnitude of option deductions is large enough to reduce MTR for NASDAQ 100 and S&P 100 firms. Consistent with the earlier study, they argue that documenting a reduction in MTRs is important because NDTS should reduce the use of debt to the extent that the NDTS alter the MTR. They also discovered that debt ratios are positively related to tax rates and negatively related to the amount by which option deductions reduce MTRs. Finally, they exhibited that firms which appear to use debt conservatively when option deductions are ignored appear significantly less underlevered when options are considered.

Graham always argues that MTR is an important input into many corporate decisions including debt policy. Given this, it is important to measure corporate marginal income tax rates accurately and choose a rate appropriate to the research question since different researchers normally employ different empirical settings. Graham (1996b) focuses on the best way to measure corporate MTR. He demonstrates that the simulated tax rates used by Shevlin (1990) and Graham (1996a) is the best proxy for true MTR. Then, Graham and Lemmon (1998), taking into account the features of the tax code, described a simulation methodology that precisely quantifies corporate tax rates. They found that simulated tax rate provides
important information about tax incentives. They used numerous examples to illustrate the complexity involved in properly calculating a firm’s tax status and described the simulation methodology used for measuring MTRs. In this paper, they focused on economic issues related to determining a corporation’s tax burden and properly measuring tax incentives. Consistent with previous research, they discovered that simulated tax rates are positively related to the use of debt financing, and negatively related to the use of leases. In his recent paper, Graham and Mills (2008) proposed different tax rates (book MTR or tax return MTR) to be used for different experimental settings. They categorize settings that involve worldwide and domestic operations and those that involve long-term as well as short-term considerations.

Since the empirical evidence in previous studies confirms only cross-sectionally that firms with high tax rates use more debt than those with low tax rates, Graham and Smith (1999) used panel data to examine whether time-series data can also explain this situation. However, they found no evidence that time-series variation does so.

3. Studies on whether personal taxes affect debt policy

The traditional view is that interest deductibility encourages firms to use debt financing; however, some argue that the personal tax disadvantage to interest offsets the corporate tax advantage. In using the Miller (1977) equilibrium and building on the work of Gordon and MacKie-Mason (1990), Graham (1999) investigates the degree to which personal taxes affect corporate financing decisions.

Even though corporate MTRs provide an estimate of the reduction in tax liability that result from deducting a dollar of interest, the tax rates potentially overstate the benefit to the firm because, at the personal level, interest income is taxed at a rate that is generally higher than the tax rate on returns from common stock (Miller, 1977). Graham (1999) argues that to measure the firm’s net benefit from interest deductions, MTRs must be adjusted to account for the personal tax penalty. Therefore, to account for the personal tax penalty, the net tax advantage to debt (relative to equity) can be represented as the proceeds received by investors from a dollar of interest income less those from a dollar of equity \((1-\tau_p) - (1-\tau_e) (1-\tau_c)\) which can be written as \(\tau_e - (\tau_p - (1-\tau_e) (1-\tau_c) \tau_e)\) where \(\tau_c\) is the corporate income tax rate, \(\tau_e\) is the personal tax rate on equity income, and \(\tau_p\) is the personal tax rate on interest income.

According to Graham (1999), when firm-specific information is used to calculate the personal tax penalty, the capital structure regressions show strong tax effects, with high tax rate firms having more debt in their capital structures than low tax rate firms. This offers evidence against Miller’s (1977) ‘no tax-induced optimal capital structure’ conclusion. He also claims that the personal tax penalty only reduces, but does not eliminate, the tax
incentive to use debt. Furthermore, he separately identifies a positive (negative) relation between the corporate tax rate (personal tax penalty) and debt usage. These results are consistent with predictions that high personal taxes on interest income (relative to personal taxes on equity income) create a disincentive for firms to use debt.

Graham (2000) explains the challenges that researchers face in quantifying the effects of interest taxation at the personal level. He discovered that the personal tax penalty reduces the corporate advantage to the deductibility of interest expense by more than fifty percent. Graham proposes that the personal tax penalty associated with interest income implies that firms must offer a higher risk-adjusted pre-tax return on debt relative to equity (the capitalized tax benefit of debt to firm value drops from 9.7 percent to 4.3 percent if personal tax penalty is considered). This result partly explains why governments allow firms to deduct interest expense from their tax base.

4. Studies on whether low tax rate firms lease from high tax rate lessors

The theory of capital structure imply that firms with low MTRs employ relatively more leases than do firms with high MTRs. The logic behind the leasing prediction is that leases allow for the transfer of tax shields from firms that cannot fully utilize the associated tax deduction (lessees) to firms that can (lessors). Graham, Lemmon, and Schallheim (1998), studied the effect of taxes on lease financing and believe that most previous empirical works fail to find a negative correlation between leasing and the tax rate because a spurious relation exists between the financing decision and many commonly used tax proxies. For example, both interest expense and lease payments are tax deductible. Thus, a firm that finances its operations with debt or leases reduces its taxable income, potentially lowering its expected MTR. If not properly addressed, this endogeneity of the tax rate can bias an experiment in favour of finding detecting tax effects.

Graham, Lemmon, and Schallheim (1998) address this issue by suggesting a new method to estimate corporate MTRs using income before debt interest and the implicit interest portion of lease payments are deducted. This approach measures a firm’s MTR net of all financing decision and account for the endogeneity problem in previous studies. They also point out that the financial statement definitions of leasing are not consistent with Internal Revenue Service (IRS) definitions. This situation makes it difficult to use the data to test the prediction whether the traditional argument is that low tax rate firms should lease assets from high tax rate lessors. To deal with this problem, this paper focused only on operating leases, which are defined in a manner similar to the IRS’ definition of true leases. In this paper they found evidence consistent with the theory where corporate MTR is negatively related to the firms operating lease.
5. Studies on whether the tax advantage of debt increases firm value

Although financing through debt provide a firm with tax benefits but we do not know by how much do tax benefits add to firm value? Graham (2000) tries to answer this question by simulating firm specific interest benefit functions and uses them to estimate the tax-reducing value of each incremental dollar of interest expense.

Graham (2000) introduced a new method in measuring the tax benefit of debt. This contrasts with the traditional approach of measuring tax benefits as the product of the corporate tax rate and the amount of debt. With this new method, Graham (2000) discovered that the average tax benefit of interest deductibility to the firm falls to 9.7 percent of market value from 13.2 percent according to the traditional approach. According to him, the main advantage of this new method over the traditional one is that it provides researchers with information about not just the MTR but the entire tax benefit function including non-debt tax shields, tax-loss carrybacks, carryforwards, tax credits, the alternative minimum tax, and the probability that interest tax shields.

Graham (2000) also estimates how much value a debt-conservative firm could add if it used more debt. He found that firms could obtain additional gross tax benefits equal to about 15 percent of firm value if they levered up to the point where their last dollar of interest deduction is valued at the full statutory tax rate (the point just before incremental tax benefits begin to decline). His estimates imply that the average magnitude of debt usage appears to be small relative to the tax benefits of debt.

6. Studies on whether participating in a tax shelter affects corporate debt policy

Graham and Tucker (2006) address prior research that some firms appear to be underlevered when debt policy is solely considered, but then appear adequately levered when other non-debt tax benefits, such as stock option deductions, are considered. In light of these previous results, they specifically test whether tax shelters, one form of NDTS, are related to debt policy. They discovered that tax shelter participants use less debt, on average, than does a set of size and industry matched control firms by 5 percentage points. This result is consistent with shelters producing NDTS that substitute for the use of corporate debt.

Graham and Tucker (2006) indicate that a substitution effect may exist between debt and tax shelters as both can be used to lower taxable income. They found that firms use less debt when their NDTS (deductions from tax shelters) are large. In particular, in the year(s) that the tax shelters are in use, sheltering firm debt ratios are more than 800 basis points lower than the debt ratios of similar-size same-industry firms.
Graham and Tucker (2006) also investigated whether the existence of tax shelters affects incremental financing decisions. They found that 60 percent of the shelter firms in the sample issue debt sometimes during the years preceding the inception of tax shelter activity. In contrast, 70 percent of matched firms issue debt. They concluded that shelter firms are less likely to issue debt compared to non shelter firms.

7. Conclusion

This paper reviews research related to the role that corporate and investor taxes play in affecting corporate policies based on Professor John R. Graham’s 12 journal articles. The research often discovered that taxes affect corporate financial decisions even though the magnitude of the effect is not always large. Most of the evidences show that high tax rate firms use debt more intensively than low tax rate firms. This is consistent with the tax research hypothesis that high tax rate firms pursue policies that provide tax benefits. Professor John R. Graham also believed that future researchers will still have to wrestle with many of the issues such as to investigate the appropriate tax variable to be used in short-term settings. It is hoped that this short review has already shown the integration among Professor John R. Graham’s article in the area of corporate finance and taxes; and help the readers to see the research contribution he has made in this area.

References


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1 A listing of the 12 journal articles discussed in this review together with Professor John R. Graham’s academic biography is provided in the Appendix.


**Appendix 1**


**Appendix 2**

John R. Graham is an American financial economist and a professor at Duke University’s Fuqua School of Business, who has published extensively in the areas of corporate finance and taxes. Professor Graham earned his undergraduate degree in 1983 from College of William and Mary in the U.S. and in 1988 obtained his M.A. from Virginia Commonwealth University. In 1994 he completed his PhD at Duke University, upon which he subsequently obtained a position as an assistant professor of finance at Utah University. In 1997, he accepted a position as an assistant professor of finance at Duke University's Fuqua School of Business. He was promoted to associate professor and full professor in 1999 and 2004 respectively.