Effect of Taxation on Corporate Financing and Investment

OGBU, Onyekachi Augustine[1] & Prof. M. I. OKWO[2]

[1 & 2] *Department of Accountancy,*

Faculty of Management Sciences,

Enugu State University of Science and Technology,

Enugu State, Nigeria.

[1] idekeinvestment@gmail.com

Abstract

Research purpose: Extensive empirical research concerning the impact of taxes on corporate decisions has had trouble identifying seemingly obvious effects. Perhaps the problem is that the seemingly obvious tax predictions are not quite right. We provide an equilibrium model with both corporate and personal taxes.

Findings: In steady state equilibrium, the level of production is affected by the corporate tax rate despite interest deductibility at the firm level; but not by the household level taxes on interest earnings or dividends. Moreover, there is a Laffer curve in the corporate tax rate.

Keywords: *Taxes, Dividends, Debt, Equity Dilution, Investment.*

1.0 Introduction

It has long been thought that income taxes are probably a key ingredient of firm investment and financing decisions, see Modigliani and Miller (1963), Hall and Jorgenson (1967), Miller (1977), and DeAngelo and Masulis (1980) among many others. This makes sense because income taxes are not legally avoidable and they involve a great deal of money paid by households and firms to the government. However, empirical support for income tax effects on firm decisions is surprisingly tenuous despite serious efforts to find such effects, see Hassett and Hubbard (2002), Graham et al. (2015) and Yagan (2015). Hassett and Hubbard (2002) observe the "empirical researchers have offered three general explanations of the failure to estimate significant tax effects on investment – (1) measurement error in fundamental

variables, (2) misspecification of costs of adjusting the capital stock, and (3) the importance of capital-stock heterogeneity".

This paper provides an alternative explanation for the lack of proper estimate of significant tax effects on investment. The fundamental problem might be the tax predictions themselves. Taxes may matter for firms but not always in the seemingly obvious ways that have been commonly tested. We show this using a consumption-based dynamic equilibrium model with a classical tax code. In the long-run steady state, the model implies a number of tax irrelevance propositions. For example, neither the dividend tax nor the tax on interest earnings has an effect on steady state real capital. These and other steady state tax irrelevance results are essentially driven by a combination of the linearity of the cash flow constraints in several factors, and the fact that in the steady state the marginal utility of consumption is constant from one date to the next.

However, outside a steady state there are often more complex tax effects. This is because the marginal utility of consumption may need to be adjusted toward the new steady state value after a tax rate change, thereby generating a gradual adjustment path. The main ingredients of the model are, the household, the firm, and the government who collects taxes. The household cares about the present value of the utility of consumption. It chooses consumption, investment in firm debt, and investment in firm shares. We abstract from labor decisions for simplicity. The firm objective function is derived from the after-tax position of the owner. The objective function is discounted using the household's pricing kernel. Each period payoff is the sum of after tax dividends less capital gain tax that the household will pay. The firm chooses physical capital, debt, and dividends. In the basic model, the number of shares is fixed.

Moreover, In the extended version of the model, the firm chooses the number of shares. There are the taxes collected by the government. Under a classical tax code there are distinct tax rates on household income in the form of dividends, capital gains, interest, and on firm profits, see Graham (2013). We augment the classical tax code by also including a consumption tax. Consumption taxes are common in many countries. The tax code is simply taken as exogenously given in the model. Implicitly the government uses the tax revenue in a manner that is disconnected from the rest of the model. Thus, we do not model the government budget constraint, nor do we derive a socially optimal tax code. So the model does not provide a welfare analysis of the tax

code. The household decisions in the model are tax adjusted, but otherwise quite standard. The price of equity is determined by after-tax cash flows discounted by the household's pricing kernel. The firm problem is slightly more novel in the literature. Motivated by Black (1976), in our model the objective of the firm is explicitly derived from the investor wealth. The derivation produces a firm objective function that reflects both taxes and the fact that if new shares are issued, new equity gets a claim to part of the future equity returns. The appropriate assumptions to make about corporate financing has been a problem for the tax literature. The assumptions about debt, equity and dividends differ markedly from paper to paper. Some papers assume no debt finance (or have it pinned down by a fixed connection to a real side decision), some papers assume no equity finance, and some papers use an exogenous dividend rule. We permit the firm to choose debt, equity, real investment and dividends. Our key simplifying assumption is that the firm has a debt target. This is convenient and realistic. We show that the firm's first order conditions for debt, dividends, and capital are the same whether or not the firm also chooses the number of shares. As a result, many features of the equilibrium are exactly the same in the two versions of the model.

Hence, The model is intended to help clarify how the tax code affects firm decisions and so the entire economy. The key results are, to the best of our knowledge, novel, and they seem broadly consistent with empirical evidence that has previously been regarded as problematic. Clearly, many other interesting and potentially important things remain to be studied. The long run tax irrelevance results are likely to turn up in many neoclassical consumption-based tax models since they depend on the linearity of the cash flow constraints and on the steady state assumption. Both of these are common modeling features. The short run impact effects of tax changes are likely to be somewhat more model specific. A variety of short-run frictions might generate different behaviors to mitigate the costs of the specific friction in a given model.

We compare a version of the model in which equity is exogenous, and a version in which the firm can choose to issue or repurchase shares. When the firm can choose to issue or repurchase equity, for reasonable tax parameters, the model generates a version of the Black (1976) dividend puzzle. Steady state dividends are zero. The firm returns money to the investor by share repurchases not by dividends. Going beyond Black (1976) we show that the firm uses more debt finance and less capital, when compared to a firm that cannot repurchase shares. Much of the related tax literature

centers on a debate between the 'old view' in which the firm is purely equity financed, and the 'new view' in which the firm is financed by retained earnings and there is no external equity finance, see Sinn (1991), and Auerbach (2002) for good overviews. Previous tax studies have generally adopted strong simplifying assumptions about the financing rather than deriving the financing from optimized equilibrium considerations. For example in Auerbach (1979), it is assumed that the required returns on debt and equity are increasing functions of corporate debt, instead of deriving the asset returns from market equilibrium conditions. Similarly, Summers (1981) assumes that the sum of dividends and capital gains returns are an exogenously specified number that is not determined by investor optimization and market equilibrium. Li et al. (2016) calibrate a capital structure model with taxes and collateral. The firm balances financial flexibility against tax benefits. They find that the versions of the model with different tax rates fit the data equally well.

Hence, the impact of taxes are not precisely estimated, which is similar in spirit to our tax irrelevance results. Their result is about magnitudes, whereas our steady state irrelevant results are analytical results. Steady state dividend tax irrelevance was previously obtained by Summers (1981). Bosworth (1981) observes that the Summers (1981) dividend tax irrelevance result does not survive if more than one type of financing is permitted. The mechanism underlying our dividend tax irrelevance result is not due to an assumption that the firm cannot issue or repurchase equity. We obtain the result even when the firm can choose optimal net equity financing. Our irrelevance propositions and their underlying mechanism have not been recognized in the literature surveyed by Auerbach (2002), Hassett and Hubbard (2002), and Graham (2013) because the prior theory is mostly not consumption-based. Stark assumptions about firm behavior are commonly adopted in order to simplify the tax analysis. There is often no requirement of equity market equilibrium, see Auerbach (1979). In some papers financing is assumed to be determined by real decisions, not by an evaluation by the firm of the costs and benefits of financing, see Summers (1981) and Auerbach (2002). The paper by Turnovsky (1990) is consumption-based, but it has no corporate debt, and dividends are determined by a fixed rule rather than by an optimal firm decision. So, in the related tax literature, the impact of taxes on optimal firm financing decisions in a steady state equilibrium is largely unexplored.

It is helpful to explain in more detail how our approach differs from Summers (1981) and Turnovsky (1990). There are several distinctive differences in modeling assumptions:

1. Summers (1981) does not explicitly model the consumer/investor problem. He simply assumes that the investor demands a fixed real after-tax rate of return. His model does not allow the investor to adapt consumption and portfolio investments to the tax rate changes.
2. Both Summers (1981) and Turnovsky (1990) assume that the firm's objective function is the value of the firm without regard to who owns that value and how the firm decisions affect investor consumption. The distinction may seem subtle and fairly unimportant. In fact, this distinction will particularly matter when equity is issued or repurchased.

To help illustrate the sense in which the distinction is actually important, in addition to the main model in section 4, we have provided an alternative firm objective function version in section 4.1. While several irrelevant properties remain the same, below are particularly important differences regarding dividends and the price of equity:

1. The main model in section 4 generates dividend policies and a price of equity that have natural interpretations and connections to the prior literature.
2. The model in section 4.1 generates equity pricing and dividends that Bosworth (1981) might have called 'abnormalities'. The price of equity is not a function of current or future dividends, and dividends are not a function of the firm's capital or profits. The heavy dependence on initial conditions and time may be logical given the assumptions, but the resulting formulas do not seem appealing.
3. In our model, the firm chooses optimal dividends. Neither Summers (1981) nor Turnovsky (1990) allow the firm to optimally choose dividends. Turnovsky (1990) considers three distinct rules governing dividend behavior. But none are the result of the firm making an optimal dividend choice. Summers (1981) assumes that dividends follow one of the three rules in Turnovsky (1990).
4. Fourth, in our model the firm chooses optimal debt given the relevant costs and benefits. In Summers (1981), it is assumed that "firms finance a fraction, b, of new investment by issuing debt". This hard-wires the debt use based on the firm's investment decision. Turnovsky (1990) does not consider the corporate

debt financing in his model. So our approach departs significantly from these related past attempts to understand how taxes affect firm decisions primarily by allowing the firm to choose an optimal financing plan. Previous tax related studies have treated the financing decisions in a more hard-wired fashion

1.1 Outline

The remainder of the paper is organized as follows:

i. Section 2 defines the model and characterizes the steady state equilibrium.
ii. The effects of tax rate changes are analyzed in section 3.
iii. Section 4 extends the model by allowing the firm to buy or sell its own shares. The main model is a general equilibrium model.
iv. Section 5 compares a partial equilibrium version of the model to the main model.
v. The conclusion is in Section 6.

2.0 The Model

The model is a real business cycle model with a tax code. As in Hassett and Hubbard (2002), we focus on the steady state equilibrium implications of the tax code. In the model there is a utility maximizing households who are subject to income taxation. The household chooses consumption and a portfolio of debt and equity claims on the firm. The household is taxed on interest, dividends and capital gains. There is a firm with a target debt level that is subject to profits taxation. The firm chooses capital, dividends, and debt issues. Equilibrium requires that the debt and equity markets are clear.

For simplicity, we work with a deterministic model. There are several ways to make the model stochastic. In earlier drafts of this paper we studied a version of the model with normal iid AR-1 production shocks following the approach in Uhlig (1999). The main qualitative properties are very similar.

Household

There is an infinitely-lived representative household that chooses debt b_{t+1}, consumption c_t , and the number of shares n_{t+1}, to maximize utility according to,

$\max \{b_{t+1},c_t,n_{t+1}\} X\infty\ t=0\ \beta\ tu(c_t)$,

3.0 Conclusion

This study uses a quasi-experimental research design to estimate the investment and financial policy responses to the DPAP. Because the DPAD creates plausibly exogenous variation in effective corporate income tax rates, the policy creates empirical variation, which can be leveraged to address an understudied question of first-order importance: How do corporate income tax rates affect corporate behavior and the economy at large? I find that corporations respond strongly to the DPAD, and corporate income tax rate cuts more generally, by increasing investment and payouts and decreasing debt usage. The average firm does not report more taxable income per dollar of asset, suggesting that any increases in revenue generated by corporate tax rate reductions are the product of real effects such as investment, but not decreased avoidance activity. As expected, the responses to the policy are driven by older, larger, more liquid firms that face higher marginal tax rates. These results are especially important as momentum for corporate tax reform builds.

This study finds that among large corporations, revenue neutral reforms that lower rates and broaden the base are not the panacea for corporate growth that proponents have claimed. In fact, estimates suggest using the revenue generated by eliminating accelerated depreciation to finance corporate rate cuts has only a modest impact on corporate investment.

In contrast to this investment effect neutrality, the two types of investment stimulus policies are very different in other ways. Firms increase payouts and issue equity in response to rate cuts. Firms that respond to accelerated depreciation are, in contrast, less likely to payout earnings and choose to finance expansions with debt. Hence, larger firms with more cash flow respond to corporate rate reductions, while smaller more financially constrained firms are more responsive to depreciation policies. As a result, lawmakers should choose to champion revenue-neutral reforms only under the conditions that:

1. They seek to incentivize corporate payouts and equity financing and
2. They prefer policies that benefit larger, more financially flush corporations.

Ultimately, the only reforms that benefit all businesses may necessarily decrease corporate tax revenues.

References

1. Altshuler, Rosanne. 2012. “Testimony of Dr. Rosanne Altshuler Professor and Chair, Department of Economics, Rutgers University Before the Senate Finance

Committee Hearing on Extenders and Tax Reform: Seeking Long-Term Solutions." https://www.finance.senate.gov/imo/media/doc/Altshuler%20Testimony%20SFC%20Tax%20Extenders1.pdf.

2. Auerbach, Alan J. 1979. "Wealth Maximization and the Cost of Capital." Quarterly Journal of Economics 93 (3): 433–46. Auerbach, Alan J., and Joel Slemrod. 1997. "The Economic Effects of the Tax Reform Act of 1986." Journal of Economic Literature 35 (2): 589–632
3. Autor, David H. 2003. "Outsourcing at Will: The Contribution of Unjust Dismissal Doctrine to the Growth of Employment Outsourcing." Journal of Labor Economics 21 (1): 1–42.
4. Baker, Malcolm, and Jeffrey Wurgler. 2002. "Market Timing and Capital Structure." Journal of Finance 57 (1): 1–32. Bertrand, Marianne, Esther Duflo, and Sendhil Mullainathan. 2004. "How Much Should We Trust Differences-In-Differences Estimates?" Quarterly Journal of Economics 119 (1): 249–75.
5. Blouin, Jennifer L., Linda K. Krull, and Casey M. Schwab. 2014. "The Effect of the Domestic Production Activities Deduction on Corporate Payout Behavior." https://papers.ssrn.com/sol3/papers.
6. Blouin, Jennifer L., Jana S. Raedy, and Douglas A. Shackelford. 2011. "Dividends, Share Repurchases, and Tax Clienteles: Evidence from the 2003 Reductions in Shareholder Taxes." Accounting Review 86 (3): 887–914.
7. Bradford, David F. 1981. "The incidence and allocation effects of a tax on corporate distributions." Journal of Public Economics 15 (1): 1–22.
8. Cameron, A. Colin, and Douglas L. Miller. 2015. "A Practitioner's Guide to Cluster-Robust Inference." Journal of Human Resources 50 (2): 317–72.
9. Chetty, Raj, Adam Looney, and Kory Kroft. 2009. "Salience and Taxation: Theory and Evidence." American Economic Review 99 (4): 1145–77.
10. Chetty, Raj, and Emmanuel Saez. 2005. "Dividend Taxes and Corporate Behavior: Evidence from the 2003 Dividend Tax Cut." Quarterly Journal of Economics 120 (3): 791–833. Compustat. 2016. Standard and Poor's. (accessed June 2016).
11. Cummins, Jason G., Kevin A. Hassett, and R. Glenn Hubbard. 1994. "A Reconsideration of Investment Behavior Using Tax Reforms as Natural Experiments." Brookings Papers on Economic Activity 24 (2): 1–7.