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Taxation and the life cycle of firms☆

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ABSTRACT

The Hopenhayn and Rogerson (1993) framework is extended to understand how different forms of taxing capital income affect firms' investment and financial policies over their life cycle. Relative to dividends and capital gains taxation, corporate income taxation slows down firm growth over the life cycle by reducing after-tax profits available for reinvesting. It also diminishes entry by negatively affecting the value of entrants relative to that of incumbent firms. After a tax reform eliminating the corporate income tax in a revenue neutral way, output and capital increase by 12% and 32%. The large response of firm entry is crucial.

1. Introduction

The macroeconomic effects of the taxation of capital income have received a great deal of attention by economists and policy makers. Throughout modern economies the taxation of capital income takes many different forms: capital gains taxation, interest income taxation, dividend taxation, and corporate income taxation. In particular, the tax rate on corporate income in the US was until recently among the highest of OECD countries, and this has raised concerns about its effects on job creation and investment. Policy advisors from the Obama and Trump administrations have advocated for changes in the taxation of capital income and, indeed, the Trump administration has recently cut by nearly half the corporate income tax rate. In this paper, we study how different forms of taxing capital income affect investment and financing decisions of firms over their life cycle, as well as the creation of new firms (firm entry), aggregate capital accumulation and output. We then evaluate the effects of a tax reform that eliminates the tax on corporate income and replaces the lost revenue with a common tax rate on all other form of capital income.

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Corporate profits distributed as dividends suffer from the so-called 'double taxation', since they are taxed both at the corporate and the personal income level (by the corporate income tax and the dividend tax, respectively). The literature has long emphasized that corporate income taxation diminishes investment by firms by reducing the after tax return on capital. In this paper, we show that these distortions are much more severe when firms' growth over the life cycle is constrained by financial frictions. The impact of dividend taxation on firm investment decisions critically depends on the stage that firms are at in their life cycle, as young firms are more likely to issue equity while old firms are more likely to issue dividends. Young firms behave according to the 'traditional view' in the finance literature: an increase in dividend taxation raises the cost of external equity financing, negatively affecting firms' investment.[1] However, as emphasized by the 'new view' in the finance literature, dividend taxation does not affect investment decisions of firms distributing dividends (mature firms), since the dividend tax leads to an equiproportional reduction in the return and costs of investment. More generally, our paper stresses that the various ways capital income can be taxed (whether corporate income, dividend, or capital gains taxation) have quite different effects on investment and payout policies over the life cycle of firms, and hence on the life cycle growth of firms. They also have different and asymmetric effects on the market valuation of new versus incumbent firms, and thereby on firm entry.

Our paper is motivated by micro evidence on firm dynamics and the life cycle of firms. Haltiwanger et al. (2013) argue that start ups play a critical role for understanding US employment growth dynamics. The mass of firms entering the economy is large, most new businesses start as small but (conditional on survival) grow fast, and new entrants are important for understanding employment growth. Moreover, Hsieh and Klenow (2009) argue that the cross country differences in the life cycle growth of firms are important for understanding aggregate productivity differences across countries. The evidence indicates that firms face substantial equity issuance costs (see Hennessy and Whited (2007), Lee et al. (1996)). Using micro evidence from US and UK firms, Cloyne et al. (2018) show that financial frictions affect more strongly investment decisions of young firms than that of mature firms. Campbell et al. (2013) empirically document heterogeneous investment responses across young and mature firms after the reduction on shareholder taxes in the US in 2003. Becker et al. (2013) study many tax reforms on 25 countries over a 20 year period, finding that changes in payout taxes affect firms differently depending on their financial regime. Overall, this evidence points to the importance of modeling the life cycle of firms for assessing the effects of taxation. A model with a representative firm, as in the standard Neoclassical Growth Model, implicitly focuses on mature firms (i.e. those distributing dividends where the 'new view' holds), disregarding the evidence that investment responses to tax changes vary over the life cycle of firms. Moreover, the empirical findings of Haltiwanger et al. (2013) suggest that it is important to consider the impact of taxation on business entry.

We extend the Hopenhayn and Rogerson (1993) framework of firm dynamics to understand how different forms of taxing corporate income affect the life cycle of firms. We start by analysing a simple version of the model with a deterministic fixed level of productivity determined upon entry. Companies need to raise equity to set the firm up, starting their life in the 'traditional view' regime (equity issuance phase). They grow by accumulating profits (growing phase), until they reach their optimal size and start distributing dividends (maturity phase). Consistent with the 'new view', dividend taxation does not distort investment decisions and dividends paid by mature firms. However, dividend taxation diminishes the optimal amount of initial equity issued by firms. Intuitively, firms can diminish the taxes paid by financing a larger portion of investments with retained earnings. Hence, dividend taxation reduces the initial size of firms, retarding the age at which they reach maturity, and diminishes entry. The taxation of capital gains has the opposite effects of dividend taxation. First, the taxation of capital gains encourages firms to issue more equity at entry in order to avoid paying the taxes that would accrue with the accumulation of internal funds. Second, it distorts the optimal scale of the firm at maturity. Corporate income taxation impacts on capital accumulation through several channels. First, corporate income taxation distorts the optimal size and dividends paid by mature firms by decreasing the return on capital. Second, crucial to our analysis and results, the corporate income tax decreases after-tax earnings, making it harder for firms to finance investment with retained earnings and causing firms to grow at a slower pace over their life cycle. As a result, the market value of the firm decreases, leading to two additional effects of corporate income taxation on capital accumulation: firms raise less equity at entry, and the equilibrium mass of entry becomes smaller. While these effects are also present under dividend taxation, they are stronger under corporate income taxation.

The baseline economy with firm dynamics (due to idiosyncratic productivity shocks at the firm level) is calibrated to moments on the micro data on firms' investment and financing decisions. We use the calibrated model economy to quantitatively assess the effects of a reform that eliminates the taxation of corporate income while keeping constant the tax revenue collected on capital. This is done by finding the common tax rate (τ) on all forms of capital income (dividends τ_d, interest income τ_r, and capital gains τ_g) that collects the same tax revenue as in the baseline economy. The purpose of the proposed policy reform is twofold. Firstly, all sources of capital income are treated symmetrically from the household perspective. Secondly, by eliminating the corporate income tax, financially constrained firms are able to accumulate profits and to reach maturity (the dividend distribution stage) faster. The elimination of the corporate income tax in the baseline economy ($\tau_c = 0.34$) should be accompanied by an increase in the other capital income tax rates to 0.41 in order

[1] See, for instance, (Auerbach, 2002) for a description of these views. Empirical findings on this issue are mixed. For instance, Poterba and Summers (1985) find evidence supporting the traditional view using British data. Kari et al. (2009) find evidence supporting more the new view using Finnish data. Auerbach and Hassett (2007) found that in the US, firms behave according to both views, which points to the coexistence of both regimes in the data.