Taxation and the life cycle of firms

ANDRÉS EROSA AND BEATRIZ GONZÁLEZ

Summary of Banco de España Working Paper no. 1943

The aim of this paper is to understand how different forms of taxing capital income affect investment and financial policies over the life cycle of firms. Relative to dividends and capital gains taxation, corporate income taxation slows down growth of firms 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. With these mechanisms in mind, we calibrate our model economy to the US and discuss different revenue-neutral tax reforms that would lead to increases in aggregate output and capital.

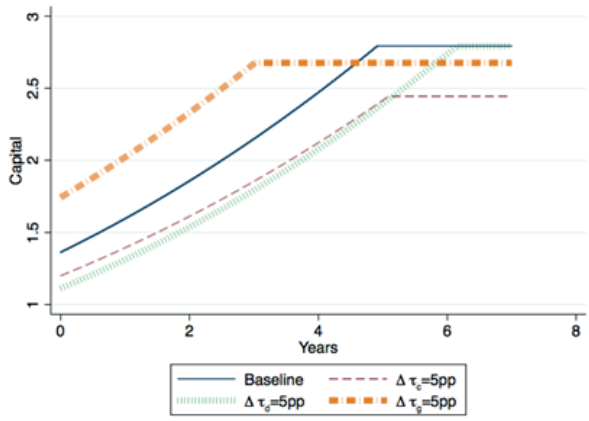
Incentivizing employment growth and having a dynamic firm environment is at the heart of most firm-related policies all over the world. Evidence showing the importance of young and small firms for employment creation (Haltiwanger *et al.* 2013) have spurred a lot of policy actions targeted towards these firms, such as tax incentives to small businesses or subsidies to firm creation. However, despite its policy importance, there is still a lack of understanding of how different simple capital taxes might affect growth of firms over the life cycle, and the decision to start a firm. In this paper, we claim that the various ways capital income can be taxed (corporate income, dividend, or capital gains taxation) have very different effects on investment and payout policies over the life cycle of firms, and hence on their life cycle growth. They also have different and asymmetric effects on the market valuation of new versus incumbent firms, and therefore on firm entry. To this purpose, we extend the (Hopenhayn and Rogerson 1993) framework of firm dynamics by introducing different ways of taxing firms' income as in (Gourio and Miao 2011) .

HOW DO TAXES IMPACT THE LIFE CYCLE OF A FIRM?

We start by theoretically analysing a simple version of the model with a deterministic fixed level of productivity determined upon entry. A firm needs to raise equity to start operating (equity issuance phase). Once the firm is set up, they continue growing by reinvesting profits in the firm (growing phase), until they reach their optimal size and start distributing dividends (maturity phase). Even in this very simple setting, each of the taxes have asymmetric effects in each of these three phases, along the lines of (Korinek and Stiglitz 2009).

Figure 1
THE LIFE CYCLE OF FIRMS

Life cycle of three identical firms in equilibriums with different taxes. Blue is the baseline: corporate tax $\tau_c = 0.34$, dividend tax $\tau_d = 0.15$, capital gains tax $\tau_g = 0.15$ and interest rate tax $\tau_r = 0.25$. Changes after an increase of 5pp of each of the tax rates one at a time, maintaining everything else constant. X-axis is years since creation of the firm. Y-axis is capital (size) of the firm. Firm is created in year 0 (equity issuance phase), grows by reinvesting (growth phase) until they reach their optimal size (maturity phase).



An increase in dividend taxes (see green dashed line of Figure 1) would not distort the investment decisions of firms in the maturity phase (this is called the 'new view' of dividend taxation). This is because this increase has proportional effects on the benefits and cost of investment. However, it decreases the amount of equity raised in the equity issuance phase, which means firms start with a smaller size and therefore the growing phase becomes longer (this is the 'traditional view' of dividend taxation). Intuitively, since the profits reinvested in the firm are not taxed by dividend taxes, the firm can effectively diminish the taxes paid by reducing (initial) equity issuance and by financing investment with retained earnings.

Increasing capital gains taxation (see yellow dashed line of Figure 1) encourages firms to issue more equity at entry stage in order to make the growth phase shorter. This is because a decrease of internal growth translates in an smaller increase of the value of the shares of the firm, which are taxed at capital gains tax rate. Furthermore, it distorts the optimal size of the firm at the maturity phase, since the return on holding firms' shares needs to increase to satisfy the non-arbitrage condition, and when technology features decreasing returns, this is attained by reducing the optimal size of the firm.

Finally, an increase in corporate income taxation (see red dashed line of Figure 1) impacts all three stages of the firm. First, it decreases the optimal size and dividends paid at maturity phase by decreasing the return on capital. Second, it decreases after-tax earnings, making it harder for firms to finance investment in the growth phase with retained earnings, which translates in firms growing at a slower pace over their life cycle. As a result, the market value of the firm decreases, which makes firms raise less equity when they are setting the firm up at the equity issuance phase.

AGGREGATE EFFECTS OF REFORMING THE TAXATION OF CAPITAL INCOME

With these mechanisms in mind, we enrich the simple model by introducing idiosyncratic productivity shocks at the firm level and capital adjustment costs and study this issue in a full general equilibrium model with endogenous entry. The model is calibrated to the US, using micro data on firms' investment and financing decisions. We use the calibrated model economy to quantitatively assess the effects of a reform that decreases the taxation of corporate income while keeping constant the tax revenue collected on capital. This tax cut is financed by an increase of all the other taxes on capital income (dividend, interest income, and capital gains taxes), which are set to a common tax rate. The purpose of the proposed policy reform is twofold. Firstly, all sources of capital income are treated symmetrically from the shareholders' perspective. Secondly, by decreasing the corporate income tax, financially constrained firms are able to accumulate profits and to reach maturity phase faster. Note that although the tax mix changes, the tax burden still falls on the shareholders, i.e. the owners of the firms.

In equilibrium, such tax policy leads to an increase in the initial size at entry, a decrease in the optimal size at maturity, and a decrease in the time to reach maturity. The decrease of corporate income taxation allows financially constrained firms to retain a larger fraction of their earnings and increase their investment. Since the ability to retain earnings is particularly relevant for young firms (they are more likely to be constrained than the average incumbent firm in the economy), the tax reform benefits mostly young firms, thereby increasing entry significantly. Aggregate output increases, accompanied by a large increase in the aggregate capital stock. Larger firm entry, together with a reallocation of resources to financially constrained firms, lead to a significant increase in aggregate TFP. The large response of firm entry is important for understanding the macroeconomic effects of the tax reform: when entry is kept fixed, the increase in output is a third and the rise in capital is half of those in the economy with endogenous entry.

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