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Abstract

While corporate taxation is a major issue in the debate over international finance, economic theory has no clear stance on who bears its burden. On balance, economists seem still more prone to accept that taxing profits does not affect corporations' outcomes. This paper makes three cases for non-neutrality. First, since corporate taxation is asymmetric between profit and loss, the tax rate may change the ranking of alternative investments. Secondly, the imperfect observability of the use of internal resources makes pure economic profits very difficult to detect. Thirdly, when the pervasive role of entrepreneurship is fully taken into account, corporate taxation appears clearly as a direct tax on market adjustments and as an indirect tax on wages.

JEL Codes: H25, H22, B25, L26.

1 Introduction

In 2007, top marginal corporate tax rates among the member countries of the European Union ranged from a low of 10% (Bulgaria and Cyprus) to a high of 38,36% (Germany), with Italy closely following with a rate of 37,25 percent. In the world list of top corporate taxing countries, Japan scores first with a rate of 40.7%, followed by US and Germany, with the average level of corporate taxes in the EU declining from 38% in 1993 to 24.2% in 2007 (KPMG, 2007). This trend toward decrease, which is not limited to EU, is mainly due to the competition between countries to attract and keep foreign investment. In 1998, corporate tax revenues represented approximately 11 percent of U.S. federal government revenues, or 2.2 percent of U.S. gross domestic product.

While the link between higher indirect taxes and higher prices is obvious to anyone who buys goods and services, the actual incidence of corporate tax is less well understood. Thus, it comes as no surprise that economic literature has not delivered any neat result about who pays corporate taxes, yet. In the standard

textbook exposition, the incidence of this kind of taxes is rarely put into discussion and the most common result is that taxing profits does not change the production choices, independently of market structure. In the stream of more technically oriented literature, Krzyzaniak and Musgrave (1963) maintain that corporate taxation can be shifted backward or forward, due to market structure. Using a competitive general equilibrium model, Harberger (1962) proves that the tax is fully passed backward to capital owners. Feldstein, Green, and Sheshinski (1979) demonstrate that backward shifting is impossible in the case of a perfectly elastic capital supply. The implications of corporate taxation for the allocation of financial resources are somewhat more clear. In the effort of reducing their tax obligations, corporations generally are induced to use debt rather than equity finance, for interest payments to bondholders are deductible from taxable income, while dividend payments to corporate shareholders are not: in this perspective, Auerbach (2005) provides strong evidence that this results in higher debt/equity ratios.

The aim of this paper is showing that the case for corporate tax neutrality does not hold as a general rule. To prove this result, the section 2 reviews the traditional neoclassical model used to demonstrate that corporate taxes do not impact on firm's decisions: this result holds true only to a very limited extent, since it ignores uncertainty and investment choices. Section 3 reviews three main reasons why the effects of taxing profits may be far from neutral. First, under very general conditions, corporate taxes may change the ranking of alternative investment choices, even though the distribution of uncertain outcomes is fully known to the entrepreneur. Secondly, since current taxation procedures rely on book values, pure entrepreneurial activities become depressed in favor of deductible monetary costs. Thirdly, the Austrian approach marks a drastic departure from the neoclassical paradigm, for it assumes entrepreneurship as the essence of firm's activities: in this framework of intrinsically uncertain knowledge, taxing corporations reduces market efficiency, equilibrium adjustment, and long-run growth of wages.

2 The case of neutrality

The standard public finance literature (Ulbrich, 2003; Cullis and Jones, 1998; Musgrave and Musgrave, 1989; Brown and Jackson, 1982; Steve, 1976) treats the problem of corporate taxation focusing exclusively on the highly stylized model of the neoclassical firm, whose only control variable is the size of production¹. For a neoclassical firm, the objective function is:

$$\max_q \pi(q) = p(q)q - c(q)$$

where $q \in \mathfrak{R}_0^+$ is the size of production, $\pi \in \mathfrak{R}$ is profit, $p(q)$ is the inverse demand curve, and $c(q) \in \mathfrak{R}_0^+$ is the total cost function, including wages, other

¹An exception to this way of presenting tax corporation is provided by Stiglitz (2000).

variable costs, interest paid, and capital depreciation. Under the assumption of differentiability with regard to c and p , maximization of π requires

$$\frac{\partial p(q)}{\partial q}q + p(q) = \frac{\partial c(q)}{\partial q} : \quad (1)$$

at the optimal size q^* , the marginal revenue from selling q^* units of product must equal the marginal cost needed to produce them.

In this context, corporate taxation turns the profit function into

$$\pi_\theta(q) = (1 - \theta)[p(q)q - c(q)]$$

where $\theta \in [0, 1]$ is the tax rate. No matter what the value of θ , optimality condition (1) continues to hold, since both sides of the equation are affected by the tax rate in the same proportion. Economically relevant resources are not diverted away from their current uses: simply, government collects revenues equal to $\theta\pi_\theta(q^*)$. The incidence analysis is straightforward: What is changing here is just income distribution—a net transfer from stockholders to government bureaucrats—but the total wealth available to society is unaffected, since q^* does not depend on θ .

To investigate whether the corporate tax impacts the long-run equilibrium of a given sector, we must make further assumptions on market structure. This is what we assume: (1) all sectors are taxed at the same rate and (2) the sector under study is perfectly competitive. It follows that in the long run the following relation must hold also

$$\frac{\partial p(q)}{\partial q}q + p(q) = p^* = \frac{\partial c(q)}{\partial q} = \frac{c(q^*)}{q^*};$$

in other words, the long-run price, endogenously determined by exits and entries of firms, would be large enough to just cover average costs, thus driving profits to zero, as well as revenues from corporate taxes. This result corroborates what was previously obtained in the case of short run: corporate tax is completely neutral with regard to quantity determination *and* also to the number of firms operating in a given sector. Even though the total collected revenues for the government grow linearly with the firm's total profit, the effect of corporate taxation is exactly the same as a lump-sum tax.

3 The case of non-neutrality

The previous model of fiscal incidence leaves no room for allocational effects of corporate taxation. This extreme result was obtained under the assumption of perfect knowledge of selling price and no uncertainty over costs and revenues. As soon as we depart from this scenario, tax neutrality invariably disappears. Whether we introduce uncertainty, imperfect observation of profits, or actual entrepreneurship, potential welfare losses and market distortions arise.

3.1 Uncertainty

Consider the following scenario. A risk-neutral entrepreneur can choose between two alternative risky investments, namely a and b , which assume values $x^i \in \mathfrak{R}$, with $i \in \{a, b\}$ and a known cumulative distribution function of probability $F(x^i) = \Pr\{t \leq x^i\}$, with $t \in (-\infty, \infty)$. The expected value of both investments is assumed strictly greater than zero. To simplify matters, assume that no variable production cost is involved by any project. Given all this, the expected return of the i -th investment is

$$E[x^i] = \int_{-\infty}^{+\infty} x^i dF(x^i).$$

Provided entrepreneur's neutrality toward risk, we have

$$a \succeq b \Rightarrow E[x^a] \geq E[x^b]$$

i.e., only expected returns matter to him. Now, assume that profits are taxed with a constant rate $\theta \in [0, 1]$ if and only if their realized value is greater than zero. In this case the expected return of the i -th investment becomes

$$E[x^i|\theta] = \int_{-\infty}^0 x^i dF(x^i) + (1-\theta) \int_0^{+\infty} x^i dF(x^i).$$

Other things being equal, then, the introduction of corporate tax decreases the expected return in the case of success. We are ready to demonstrate the following

Theorem 1 *When positive profits are taxed, the value of θ changes the relative profitability of mutually exclusive investments.*

Proof. Since positive profits are taxed, investment a is chosen in place of b when

$$(1-\theta) \left[\int_0^{+\infty} x^a dF(x^a) - \int_0^{+\infty} x^b dF(x^b) \right] \geq \int_{-\infty}^0 x^b dF(x^b) - \int_{-\infty}^0 x^a dF(x^a) \quad (2)$$

Without loss of generality, assume that the difference on left side of the inequality is strictly greater than zero, that is to say that

$$\int_0^{+\infty} x^a dF(x^a) \geq \int_0^{+\infty} x^b dF(x^b): \quad (3)$$

as long as the term on the right side is negative, the inequality is preserved no matter what the value of θ . On the contrary, when the term on the right side is positive, the inequality holds as long as

$$\theta \leq 1 - \frac{\int_{-\infty}^0 x^b dF(x^b) - \int_{-\infty}^0 x^a dF(x^a)}{\int_0^{+\infty} x^a dF(x^a) - \int_0^{+\infty} x^b dF(x^b)} \quad (4)$$

Naming $\bar{\theta}$ the value of θ for which the previous inequality holds as an equality, it follows immediately that when $\theta \geq \bar{\theta}$ then the b investment shows a higher expected value than a , even though the expected value without taxes of a is higher than b 's. The ranking of profits from alternative investments is thus affected by θ . ■

Example 1 Consider two investment projects such that their probabilities of success are $p_a = 0.5$ e $p_b = 0.64$ with returns equal to $x_a^1 = 200$ and $x_a^2 = -10$ for the a project and $x_b^1 = 180$ and $x_b^2 = -50$ for the b project. The expected return of the a project is 95, whereas the expected return of the b project is 97.2. It follows that b should be the chosen one. However, when the corporate tax rate is $\theta > 0.14$, then the a project is chosen instead.

From the previous theorem it is straightforward to prove the following

Corollary 1 Assume that the entrepreneur must pay a fraction θ of the profits in case of success, while receiving a unitary subsidy equal to ϕ in case of failure. Then, the choice between mutually exclusive investments does not depend on the values of θ or ϕ only when $\theta = \phi$.

Proof. Introducing loss subsidy, condition (2) becomes

$$(1 - \theta) \left[\int_0^{+\infty} x^a dF(x^a) - \int_0^{+\infty} x^b dF(x^b) \right] \geq (1 - \phi) \left[\int_{-\infty}^0 x^b dF(x^b) - \int_{-\infty}^0 x^a dF(x^a) \right] \quad (5)$$

because of the linear property of the expected value. This expression is independent of tax and subsidy rates only when $\theta = \phi$. In this case, the comparison between the profitability of alternative investment projects is restored to the case of no taxation and the ranking between them is unaffected. Now, the fiscal policy of the government is completely neutral with regard to the investment choice. ■

In very general terms, corporate taxes do modify entrepreneurial choices², unless the government subsidizes losses using a unitary rate of the same value. Only in this case, therefore, corporate tax is made neutral.

²Assuming that the utility function defined over the set of returns is decreasing in the risk and that the same function has the expected utility property, i.e.

$$u(p \circ x^1 \oplus (1-p) \circ x^2) = pu(x^1) + (1-p)u(x^2)$$

where p is the probability of success, with $x^1 > 0$ and $x^2 < 0$, the same results obtained in the case of linearity also hold true.

3.2 Earnings and Profit

A more realistic perspective on the incidence of corporate tax must necessarily take into account how the tax is determined and administered. Following Longobardi (2005) we make a distinction between earnings and economic profit.

Definition 1 (Earnings) *Earnings are the difference between revenues and costs defined on the commercial year. It is equal to*

$$u = p(q) - w_e L_e - r_e K_e - C - A$$

where $w_e L_e$ are total paid wages, $r_e K_e$ is the using cost of capital rental, C is the value of intermediate goods, and A is the capital depreciation.

Definition 2 (Profit) *Profit is what the entrepreneur receives once that all factors of production are paid at the opportunity cost. It is equal to*

$$\pi = u - w_p L_p - r_p K_p$$

where $w_p L_p$ is the implicit salary obtained by the entrepreneur and $r_p K_p$ is the figurative using cost of the capital owned by the firm.

It is a matter of fact that corporate taxes are almost universally based on earnings because the figurative costs $w L_e + r K_e$ cannot be readily obtained by standard bookkeeping procedures. Provided that $u \geq \pi$, it follows that the usual techniques of corporate taxation based on observation of earnings systematically overestimate the economic profit obtained by the entrepreneurs. Furthermore, this kind of taxation creates a distortion in the use of resources. To see why, consider the case of a firm operating in a perfectly competitive market in which earnings are taxed. The profit function of this firm is

$$\pi(\theta) = (1 - \theta) [p f(K_e, K_p, L_e, L_p) - w L_e - r K_e + F] - w L_p - r K_p$$

where we have made the following substitutions: $w = w_e = w_p$, $r = r_e = r_p$, $F = C + A$. From the inspection of first order conditions for the maximization of π with regard to internal resources we have

$$\frac{\partial f}{\partial K_p} = \frac{r}{p(1-\theta)} \quad \frac{\partial f}{\partial L_p} = \frac{w}{p(1-\theta)}$$

under the assumption of decreasing returns to internal capital and entrepreneurial work, the optimal employment of these two factors must decline in response to corporate taxation based on earnings³. Also in this case, taxing profits is far from neutral, since it implies the substitution of internal capital with external capital and substitution of entrepreneurial activities with labor.

³This result is consistent with the ones obtained by Harberger (1964).

3.3 The Austrian approach

Perhaps, the most radical critique to neutrality in the case of corporate taxation comes from the Austrian school of economics. This peculiar methodological approach can frame the question of tax incidence from a very different viewpoint, for Austrians explicitly endorse a fully entrepreneurial concept of the firm. The idea of entrepreneurship is all but new to economic theory: since the very beginning of the economic science⁴, economists have realized that entrepreneurship is not an accidental qualification of a firm's life, rather lying at its very core. Unfortunately, no economist from the classical school ever focused on the entrepreneurial function (Blaug, 1997, p. 442) and the whole stream of classical economics lacks completely the analysis of dynamic action taken by real individuals (Gopakumar, 1995). Furthermore, neoclassical economics, with its strong emphasis on perfect knowledge and mathematical maximization procedures, leaves no room for entrepreneurial activities which, by their own nature, rely more on creating *new* knowledge rather than using *existing* knowledge. True, a world without entrepreneurship would look like the idealized walrasian prototype and no action would ever be taken⁵. However, actual economic life is very different.

According to the Austrian approach, real markets adjust continuously to modifications in preferences, technologies, and resource availabilities. This process of constant change creates new profit opportunities: only alert entrepreneurs who succeed in anticipating the new patterns of consumption gain a positive profit; those who fail suffer from loss. Up to this point, the approach of the Austrian school does not depart from the neoclassical economics' theory of entrepreneurship. Nevertheless, Kirzner (1997) explicitly states that, contrary to popular wisdom, profits are *not* the payment for any productive input, notwithstanding the potential for creating additional wealth. Entrepreneurship is not a kind of systematic search for profit, since any systematic pattern of behavior is predictable and leads ultimately to zero profits. Realized profits, in the Austrian tradition, far from being a normal component of income, mark the presence of disequilibrium in the marketplace *and* successful entrepreneurial activities.

This point needs clarification. Factors of production are always paid in advance: their monetary payment is exchanged for the use of scarce resources and is never conditional upon the success of the firm. Profit is a different source of wealth, since the kind of uncertainty faced by the entrepreneur is intrinsically unpredictable. If it were at least partly predictable, i.e. if the average return of entrepreneurial activity were stable and known in advance, then that action would soon become a part of the management routine and others entrepreneurs would follow in pursuing the same strategy. As soon as a profitable idea becomes common knowledge, it does not bring profitable results any longer. Unfortunately, positive profits in a given year do not necessarily imply the same gain during

⁴The two classical references are Cantillon (1755) and Say (1817). Other remarkable contributions include Schumpeter (1911); Mises (1998a); Kirzner (1976, 1997).

⁵On the Austrian concept of human action see Rothbard (1962, chap.1).

the next year. It follows that the standard marginal analysis cannot be properly applied to entrepreneurial activity.

So, what is the role for corporate taxation in this context of uncertainty? Since taxing profits operates only when profits are positive, it does decrease incentives for talented entrepreneurs to engage in satisfying consumers' wants. Individuals find it convenient to engage more in routine tasks and less in innovation, speculation, forecasting, and so the economy's growth rate and capital accumulation decline. Prices adjust to equilibrium values more slowly, the economy becoming less flexible and more sensitive to external shocks. In other words, taxing profits not only affects the incentives to pursue an already-known alternative, but it also affects the incentives to adopt a not-yet-known course of action (Sautet, 2005). The individual incentive to create new information is affected and the outcome is a society in which people are less informed and less responsive to consumer's preferences. Contrary to the neoclassical case described in (3.1), in this context subsidizing losses would not alleviate the problem, rather making it worse, for it would also decrease the incentive to avoid losses: entrepreneurial activities would be weakened even more⁶.

Last but not least, Mises (1998b) also contends the point that taxing profits can permanently shift the balance between capital and labor. Since in the long run corporate taxation decreases the level of capital accumulation in the economy, the marginal productivity of labor cannot grow and so cannot wages. Consequently, the only real source for the enrichment of the labor class is severely damaged. This perverse effect works against the intention of the political parties which support corporate taxation on the ground that capitalists and workers fight over the distribution of a cake of given size. This unintentional effect on salaries and wages is less apparent than other distortions, but probably lies among the most severe ones.

4 Conclusion

The growing awareness that low corporate tax rates are crucial to attract foreign investments has not been translated in a consistent set of analytical results, yet. Most of the literature on the incidence of corporate tax either relies on patently unrealistic assumptions on investment possibilities or neglects the key role played by entrepreneurs. Likely, the apparent lack of well-established results in this field is due to the missing link of entrepreneurship, an issue which is almost absent or downplayed in the neoclassical theory of the firm. The distortions induced by taxing corporations are countless and the dynamic effects on capital formation, wages, and market adjustments appear extremely relevant. Nonetheless, fiscal

⁶Using a neoclassical approach to entrepreneurship, but taking into account some simple forms of uncertainty, Cullen and Gordon (2007) show evidence that US personal income tax also affects entrepreneurial risk taking, a result which corroborates previously obtained results (Feldstein and Slemrod, 1980).

competition is constantly improving the world economy.

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